



Program Guide

updated January 18

PLEASE NOTE: The conference will run in the Eastern time zone

To locate your presentation:

- Refer to the Oral Presenters or Poster Presenters list for your name and page number.
- Locate the page in the program-by-day pages.

Abstract Book

To locate your abstract:

- Refer to the session topics in the front pages or the author index at the end of the pdf for the page number.
- Locate the page number and your abstract.



CONFERENCE PROGRAM

ELECTRONIC MATERIALS AND APPLICATIONS (EMA 2022)

JANUARY 19 – 21, 2022 | DOUBLETREE BY HILTON | ORLANDO, FLA., USA

Organized by the ACerS Electronics and
Basic Science Divisions

ceramics.org/ema2022





ELECTRONIC MATERIALS AND APPLICATIONS (EMA 2022)

WELCOME

On behalf of The American Ceramic Society's Electronics and Basic Science Divisions, welcome to the 2022 Conference on Electronic Materials and Applications (EMA 2022). 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 2022 technical program includes plenary talks, invited lectures, contributed papers, poster presentations and open discussions. A full schedule is included here. You will find symposia focused on advanced characterization methods; processing, properties, and applications of advanced electronic materials; ferroic oxides; complex oxide films; mesoscale properties of electronic materials; complex oxide and chalcogenide semiconductors; superconducting and magnetic materials; structure-property relationships in relaxors; ion conductors; basic science and electronic applications in microstructure evolution; materials for 5G telecommunications; thermal transport; and material design.

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. Special lunchtime sessions will be geared toward students and young professionals. The awards for best poster and presentation will be presented at the Friday Student Award Session. We hope to see you there!

All registrants have access to all session recordings via the virtual platform through March 31, 2022. Check the meeting website for a link.

Thank you for your participation.

ORGANIZING COMMITTEE



Jennifer Andrew, (Electronics Division)
University of Florida, USA

Andrew



Amanda Krause, (Basic Science Division)
University of Florida, USA

Krause



Edward Gorzkowski, (Electronics Division)
Naval Research Laboratory, USA

Gorzkowski



Shen Dillon, (Basic Science Division)
University of California, Irvine, USA

Dillon

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ELECTRONIC MATERIALS AND APPLICATIONS 2022

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Welcome from The American Ceramic Society (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.



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silent

During oral sessions conducted during Society meetings (to include the virtual component of our conferences), unauthorized photography, videotaping, and audio recording is strictly prohibited for two reasons: (1) conference presentations are the intellectual property of the presenting authors and are protected, and (2) engaging in photography, videotaping, or audio recording is disruptive to the presenter and the audience. Failure to comply may result in the removal of the offender from the session or from the remainder of the meeting.



No photography/
recording

Note: The Society may engage photographers to photograph sessions for marketing and promotional purposes.

MEETING REGULATIONS

MEETING REGULATIONS

The American Ceramic Society is a nonprofit scientific organization that facilitates the exchange of knowledge meetings and publication of papers for future reference. The Society owns and retains full right to control its publications and its meetings. The Society has an obligation to protect its members and meetings from intrusion by others who may wish to use the meetings for their own private promotion purpose. Literature found not to be in agreement with the Society's goals, in competition with Society services or of an offensive nature will not be displayed anywhere in the vicinity of the meeting. Promotional literature of any kind may not be displayed without the Society's permission and unless the Society provides tables for this purpose. Literature not conforming to this policy or displayed in other than designated areas will be disposed. The Society will not permit unauthorized scheduling of activities during its meeting by any person or group when those activities are conducted at its meeting place in interference with its programs and scheduled activities. The Society does not object to appropriate activities by others during its meetings if it is consulted with regard to time, place, and suitability. Any person or group wishing to conduct any activity at the time and location of the Society meeting must obtain permission from the Executive Director or Director of Meetings, giving full details regarding desired time, place and nature of activity.

Diversity Statement: The American Ceramic Society values diverse and inclusive participation within the field of ceramic science and engineering. ACerS strives 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. Visit the registration desk if you need access to a nursing mother's room or need further assistance. For childcare services, please check with the concierge at individual hotels for a listing of licensed and bonded child care options. The American Ceramic Society plans to take photographs and video at the conference and reproduce them in educational, news

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Registration Requirements: Attendance at any meeting of the Society shall be limited to duly registered persons.

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SCHEDULE AT A GLANCE

TUESDAY, JANUARY 18, 2022

Conference registration	5:00 p.m. – 6:30 p.m.
Welcome Back Mixer	5:00 p.m. – 6:30 p.m.

WEDNESDAY, JANUARY 19, 2022

Conference registration	7:30 a.m. – 5:30 p.m.
Plenary session 1	8:30 a.m. – 9:30 a.m.
Coffee break	9:30 a.m. – 10:00 a.m.
Concurrent technical sessions	10:00 a.m. – 12:30 p.m.
Lunch break on own	12:30 p.m. – 2:00 p.m.
Industry Panel for Students and Young Professionals	12:30 p.m. – 2:00 p.m.
Concurrent technical sessions	2:00 p.m. – 5:30 p.m.
Coffee break	3:30 p.m. – 4:00 p.m.
Poster session and reception	5:30 p.m. – 7:30 p.m.

THURSDAY, JANUARY 20, 2022

Conference registration	7:30 a.m. – 5:30 p.m.
Plenary session 2	8:30 a.m. – 9:30 a.m.
Coffee break	9:30 a.m. – 10:00 a.m.
Concurrent technical sessions	10:00 a.m. – 12:30 p.m.
ACerS Journal Workshop	12:30 p.m. – 2:00 p.m.
Lunch break on own	12:30 p.m. – 2:00 p.m.
Concurrent technical sessions	2:00 p.m. – 5:30 p.m.
Coffee break	3:30 p.m. – 4:00 p.m.
Student and Young Professional Reception	5:30 p.m. – 6:30 p.m.

FRIDAY, JANUARY 21, 2022

Conference registration	7:30 a.m. – 4:00 p.m.
Concurrent technical sessions	8:30 a.m. – 5:00 p.m.
Coffee break	9:30 a.m. – 10:00 a.m. and 3:30 p.m. – 4:00 p.m.
Lunch break on own	12:30 p.m. – 2:00 p.m.
Student Awards session	5:00 p.m. – 6:00 p.m.



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PLENARY SPEAKERS

Wednesday, January 19

8:30 AM



Tolbert **Professor Sarah Tolbert**, Departments of Chemistry and Biochemistry and Materials Science and Engineering, University of California, Los Angeles, USA

Title: *NSolution processed nanoporous and nanocrystal based magnetoelectric materials*

Thursday, January 20

8:30 – 9:30 AM | Orange A



Yildiz **Professor Bilge Yildiz**, Breene M. Kerr Professor in the Nuclear Science and Engineering and the Materials Science and Engineering Departments, Massachusetts Institute of Technology, USA

Title: *Energy-efficient hardware and intelligent materials for brain-inspired computing: Artificial synapses based on proton and oxygen motion*

SPECIAL EVENTS

Industry Panel for Students and Young Professionals

Wed., Jan. 19 | 12:30 – 2:00 p.m.

ACerS JOURNAL WORKSHOP: Publishing for impact

Thurs., Jan. 18 | 12:30 – 2:00 p.m.

Publishing successful research impacts the field of the research, the researcher, and broader society. Preparing the research manuscript for publication, like most processes, has both explicit and implicit rules for success.

This workshop discusses methods for preparing manuscripts that address these rules and increase the likelihood of acceptance. Lunch will be provided.

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Student and Young Professional Reception

Thurs., Jan 20 | 5:30 – 6:30 p.m.

Student Awards Session

Fri., Jan. 22 | 5:00 p.m. – 6:00 p.m. |

SESSIONS BY SYMPOSIA

Sessions	Date	Time	Location
PLENARY SESSION			
Plenary Session I	19-Jan-22	8:30 a.m. - 9:30 a.m.	Orange A
Plenary Session II	20-Jan-22	8:30 a.m. - 9:30 a.m.	Orange A
Poster Session	19-Jan-22	5:30 p.m. - 7:30 p.m.	Orange C/D
S1: CHARACTERIZATION OF STRUCTURE–PROPERTY RELATIONSHIPS IN FUNCTIONAL CERAMICS			
Advances in Scattering, Imaging, and Analytical Techniques	19-Jan-22	10:00 a.m. - 12:30 p.m.	Magnolia A
Addressing Open Questions in Functional Ceramics	19-Jan-22	2:00 p.m. - 4:00 p.m.	Magnolia A
Advances in Connecting Local and Global Structure to Properties	19-Jan-22	4:00 p.m. - 5:30 p.m.	Magnolia A
S2: ADVANCED ELECTRONIC MATERIALS: PROCESSING STRUCTURES, PROPERTIES, AND APPLICATIONS			
Advanced Electronic Materials, including Ferroelectric, Piezoelectric, Dielectric, Electrostrictive, and Pyroelectric Materials I	19-Jan-22	10:00 a.m. - 12:15 p.m.	Citrus A
Advanced Electronic Materials, including Ferroelectric, Piezoelectric, Dielectric, Electrostrictive, and Pyroelectric Materials II	19-Jan-22	2:00 p.m. - 5:30 p.m.	Citrus A
Advanced Electronic Materials, including Ferroelectric, Piezoelectric, Dielectric, Electrostrictive, and Pyroelectric Materials III	20-Jan-22	10:00 a.m. - 12:30 p.m.	Citrus A
Materials Design, New Materials and Structures, and their Emerging Applications / Reliability and Fatigue of Ferroelectrics and Related Devices	20-Jan-22	2:00 p.m. - 5:15 p.m.	Citrus A
S3: FRONTIERS IN FERROIC OXIDES: SYNTHESIS, STRUCTURE, PROPERTIES, AND APPLICATIONS			
Magnetic, Ferroelectric, and Multiferroic Films and Ceramics	20-Jan-22	10:00 a.m. - 12:30 p.m.	Magnolia A
Ferroelectric Alloys and Ferroelectric Domains I	20-Jan-22	2:00 p.m. - 4:00 p.m.	Magnolia A
Ferroelectric Alloys and Ferroelectric Domains II	20-Jan-22	4:00 p.m. - 5:45 p.m.	Magnolia A
S4: COMPLEX OXIDE THIN FILMS AND HETEROSTRUCTURES: FROM SYNTHESIS TO STRAIN/INTERFACE-ENGINEERED EMERGENT PROPERTIES			
Phenomena arising from Strain Couplings and Interface Couplings	19-Jan-22	10:00 a.m. - 11:45 a.m.	Orange A
In-situ Thin Film Characterization	19-Jan-22	2:00 p.m. - 4:00 p.m.	Orange A
Controlled Synthesis of Lateral and Vertical Heteroepitaxial Thin Films and Nanocomposites I	19-Jan-22	4:00 p.m. - 5:15 p.m.	Orange A
Controlled Synthesis of Lateral and Vertical Heteroepitaxial Thin Films and Nanocomposites II	20-Jan-22	10:00 a.m. - 11:30 a.m.	Orange A
Synthesis and Properties of High Entropy Complex Oxides	20-Jan-22	4:00 p.m. - 5:30 p.m.	Orange A
Strain- and Interface-controlled Device Performance	20-Jan-22	2:00 p.m. - 4:00 p.m.	Orange A
Characterizations of Strain, Defects, and Interfaces	21-Jan-22	10:30 a.m. - 12:15 p.m.	Orange A
Strain, Microstructures and Functionality Tuning	21-Jan-22	8:30 a.m. - 10:30 a.m.	Orange A
Controlled Synthesis of Lateral and Vertical Heteroepitaxial Thin Films and Nanocomposites III	21-Jan-22	2:00 p.m. - 3:45 p.m.	Orange A
S5: MESOSCALE PHENOMENA IN FERROIC NANOSTRUCTURES: FROM PATTERNS TO FUNCTIONALITIES			
Applications involving Electronic, Magnetic, Thermal, Optical, and Electrochemical Functionalities	21-Jan-22	8:30 a.m. - 10:30 a.m.	Cypress B
Chemistry and Physics of Ferroic Materials at Mesoscale	21-Jan-22	10:30 a.m. - 12:15 p.m.	Cypress B
Synthesis, Characterization, and Processing	21-Jan-22	2:00 p.m. - 3:30 p.m.	Cypress B



ELECTRONIC MATERIALS AND APPLICATIONS 2022

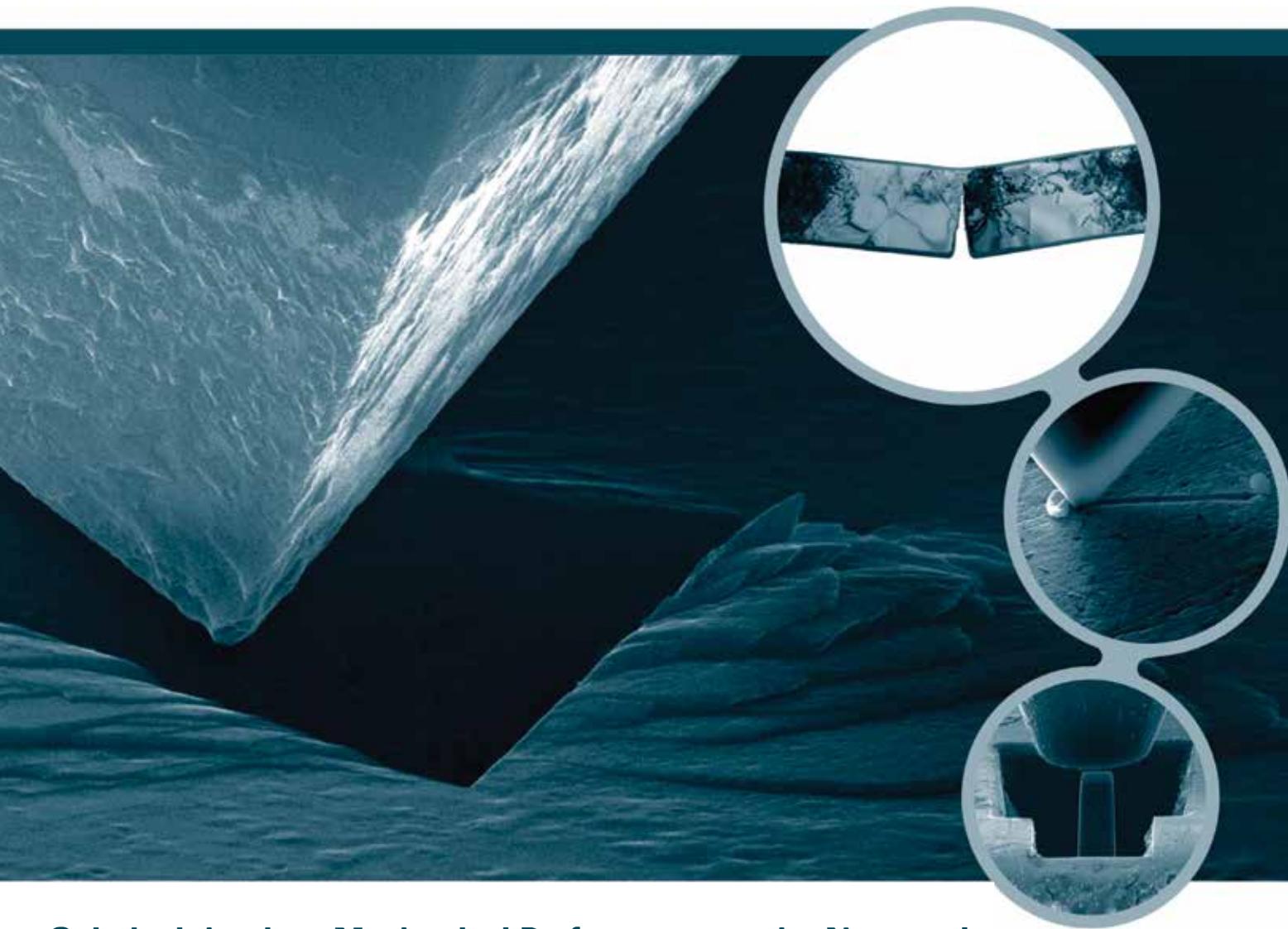
SESSIONS BY SYMPOSIA

Sessions	Date	Time	Location
S6: EMERGING SEMICONDUCTORS MATERIALS AND INTERFACES			
Advances in Thin Film Synthesis I	19-Jan-22	10:00 a.m. - 12:30 p.m.	Citrus B
Advances in Thin Film Synthesis II	19-Jan-22	2:00 p.m. - 5:00 p.m.	Citrus B
Control and Characterization over Defects and Dopant	20-Jan-22	10:00 a.m. - 11:45 a.m.	Citrus B
Wide Bandgap and Ultra-wide Bandgap Semiconductor Thin Films and Heterojunctions	20-Jan-22	2:00 p.m. - 5:45 p.m.	Citrus B
S7: SUPERCONDUCTING AND RELATED MATERIALS: FROM BASIC SCIENCE TO APPLICATIONS			
New Superconductors, Unconventional Superconductors and Related Materials I	19-Jan-22	10:00 a.m. - 12:30 p.m.	Orange B
New Superconductors, Unconventional Superconductors and Related Materials II	19-Jan-22	2:00 p.m. - 5:30 p.m.	Orange B
2D Materials and Low Dimensional Conductors I	20-Jan-22	10:00 a.m. - 12:30 p.m.	Orange B
2D Materials and Low Dimensional Conductors II	20-Jan-22	2:00 p.m. - 6:00 p.m.	Orange B
Applied Superconductors: Flux Pinning and Critical Currents	21-Jan-22	8:30 a.m. - 11:15 a.m.	Orange B
S8: STRUCTURE-PROPERTY RELATIONSHIPS IN RELAXOR CERAMICS			
Advanced nano- and Microscale Characterization Methods for Relaxors	21-Jan-22	8:30 a.m. - 10:30 a.m.	Cypress C
Local Structure of Relaxors	21-Jan-22	10:30 a.m. - 11:45 a.m.	Cypress C
Applications of Relaxors	21-Jan-22	11:45 a.m. - 12:30 p.m.	Cypress C
Multiscale Modelling and Computational Materials Design of Relaxors	21-Jan-22	2:00 p.m. - 3:00 p.m.	Cypress C
S9: ION-CONDUCTING CERAMICS			
Alonic-conducting Ceramics for Energy Storage / Synthesis and Processing Conditions on Ionic Conduction	21-Jan-22	8:30 a.m. - 11:00 a.m.	Magnolia A
S10: POINT DEFECTS AND TRANSPORT IN CERAMICS			
Point Defect Segregation to Dislocations, Surfaces, Grain Boundaries, and Interfaces	19-Jan-22	10:00 a.m. - 11:30 a.m.	Cypress B/C
Defect Mediated Properties	19-Jan-22	2:00 p.m. - 5:15 p.m.	Cypress B/C
Defect Mobility and Transport Behavior	20-Jan-22	10:00 a.m. - 12:15 p.m.	Cypress B/C
S11: EVOLUTION OF STRUCTURE AND CHEMISTRY OF GRAIN BOUNDARIES AND THEIR NETWORKS AS A FUNCTION OF MATERIAL PROCESSING			
Interface Structure and Chemistry	19-Jan-22	10:00 a.m. - 12:00 p.m.	Magnolia B/C
Microstructure Evolution	19-Jan-22	2:00 p.m. - 3:30 p.m.	Magnolia B/C
Processing Parameters	19-Jan-22	4:00 p.m. - 5:45 p.m.	Magnolia B/C
S12: 5G MATERIALS AND APPLICATIONS TELECOMMUNICATIONS			
Measurements	21-Jan-22	8:30 a.m. - 12:30 p.m.	Citrus A
Materials	21-Jan-22	2:00 p.m. - 5:00 p.m.	Citrus A
S13: AGILE DESIGN OF ELECTRONIC MATERIALS: ALIGNED COMPUTATIONAL AND EXPERIMENTAL APPROACHES AND MATERIALS INFORMATICS			
Design of Electronic Materials I	21-Jan-22	8:30 a.m. - 1:00 p.m.	Citrus B
Design of Electronic Materials II	21-Jan-22	2:00 p.m. - 4:30 p.m.	Citrus B
S14: FUNCTIONAL MATERIALS FOR BIOLOGICAL APPLICATIONS			
Functional Materials for Biological Applications	20-Jan-22	2:00 p.m. - 4:30 p.m.	Cypress B/C
S15: ADVANCED MICROELECTRONICS			
Memristors and Neuromorphic Computing	20-Jan-22	10:00 a.m. - 12:15 p.m.	Magnolia B/C
Complex Oxides for Device Applications	20-Jan-22	2:00 p.m. - 5:00 p.m.	Magnolia B/C

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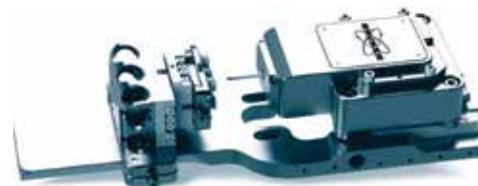
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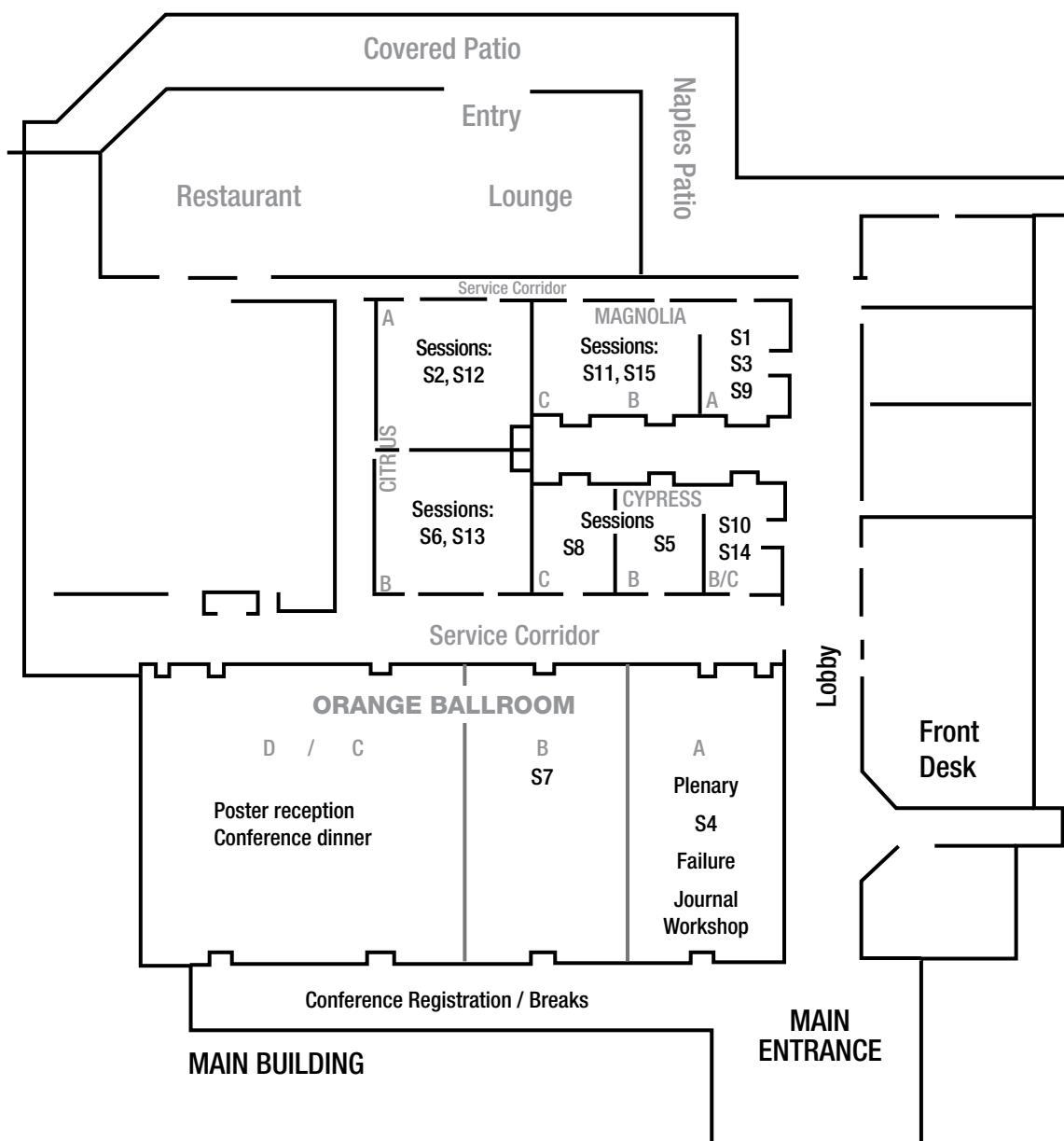
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ELECTRONIC MATERIALS AND APPLICATIONS 2022

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Doubletree by Hilton Floor Plan



SYMPOSIA

S1: CHARACTERIZATION OF STRUCTURE-PROPERTY RELATIONSHIPS IN FUNCTIONAL CERAMICS

James LeBeau, Massachusetts Institute of Technology, USA; **David W. McComb**, Ohio State University, USA; **Abhijit Pramanick**, City University of Hong Kong; **Hadas Sternlicht**, Brown University, USA; **Christopher Fancherm**, Oak Ridge National Laboratory, USA; **Igor Levin**, National Institute of Science and Technology, USA

S2: ADVANCED ELECTRONIC MATERIALS: PROCESSING STRUCTURES, PROPERTIES, AND APPLICATIONS

Eric Patterson, Naval Research Laboratory, USA; **Satoshi Wada**, University of Yamanashi, Japan; **Shujun Zhang**, University of Wollongong, Australia

S3: FRONTIERS IN FERROIC OXIDES: SYNTHESIS, STRUCTURE, PROPERTIES, AND APPLICATIONS

John Heron, University of Michigan, USA; **Morgan Trassin**, ETH Zurich, Laboratory of Functional Materials, Switzerland

S4: COMPLEX OXIDE THIN FILMS AND HETEROSTRUCTURES: FROM SYNTHESIS TO STRAIN/INTERFACE-ENGINEERED EMERGENT PROPERTIES

Weiwei Li, University of Cambridge, UK; **Jon-Paul Maria**, Pennsylvania State University, USA; **James Rondinelli**, Northwestern University, USA; **Judith L. MacManus-Driscoll**, University of Cambridge; **Yingge Du**, Pacific Northwest Laboratory, USA; **Aiping Chen**, Los Alamos National Laboratory, USA; **Elizabeth Paisley**, Sandia National Laboratories, USA; **Hyoungeen Jeen**, Pusan National University, Korea

S5: MESOSCALE PHENOMENA IN FERROIC NANOSTRUCTURES: FROM PATTERNS TO FUNCTIONALITIES

Yogesh Sharma, Los Alamos National Laboratory, USA; **Edward Gorzkowski**, Naval Research Laboratory, USA; **Serge M. Nakhmanson**, University of Connecticut, USA; **Seungbum Hong**, KAIST, Daejeon, Republic of Korea; **Yachin Ivry**, Technion – Israel Institute of Technology, Israel; **Matjaž Spreitzer**, Jožef Stefan Institute, Slovenia

S6: EMERGING SEMICONDUCTOR AND QUANTUM MATERIALS AND INTERFACES

Matthew Brahmek, Oak Ridge National Laboratory, USA; **Rohan Mishra**, Washington University in St. Louis, USA; **Jaekwang Lee**, Pusan National University, South Korea; **Sriram Krishnamoorthy**, The University of Utah, USA

S7: SUPERCONDUCTING AND RELATED MATERIALS: FROM BASIC SCIENCE TO APPLICATIONS

Bing Lv, University of Texas at Dallas, USA; **Mike Susner**, Air Force Research Laboratory, USA; **Timothy Haugan**, Air Force Research Laboratory, USA; **Gang Wang**, Institute of Physics, Chinese Academy of Sciences, China

S8: STRUCTURE-PROPERTY RELATIONSHIPS IN RELAXOR CERAMICS

Marco Deluca, Materials Center Leoben Forschung GmbH, Austria; **Prasanna V. Balachandran**, University of Virginia, USA; **Antonio Feteira**, Sheffield Hallam University, United Kingdom; **Jiri Hlinka**, Institute of Physics, Academy of Sciences of the Czech Republic, Czech Republic

S9: ION-CONDUCTING CERAMICS

Hua Zhou, Argonne National Laboratory, USA; **Erik David Spoerke**, Sandia National Laboratory, USA; **Wei Tong**, Lawrence Berkeley National Laboratory, USA; **Jon Ihlefeld**, University of Virginia, Charlottesville, USA

S10: POINT DEFECTS AND TRANSPORT IN CERAMICS

Tiffany C. Kaspar, Pacific Northwest National Laboratory, USA; **Douglas L. Irving**, North Carolina State University, USA; **Till Frömling**, Technische Universität Darmstadt, Germany; **Dong Yanhao**, Massachusetts Institute of Technology, USA

S11: EVOLUTION OF STRUCTURE AND CHEMISTRY OF GRAIN BOUNDARIES AND THEIR NETWORKS AS A FUNCTION OF MATERIAL PROCESSING

James Wollmerhauser, Naval Research Laboratory, USA; **Edward Gorzkowski**, Naval Research Laboratory, USA; **Amanda Krause**, University of Florida, USA

S12: 5G MATERIALS AND APPLICATIONS TELECOMMUNICATIONS

Nate Orloff, National Institute of Standards and Technology, USA; **Mitch Wallis**, National Institute of Standards and Technology, USA; **Geoff Brennecke**, Colorado School of Mines, USA; **Ling Cai**, Corning, USA; **Turan Birol**, University of Minnesota, USA

S13: AGILE DESIGN OF ELECTRONIC MATERIALS: ALIGNED COMPUTATIONAL AND EXPERIMENTAL APPROACHES AND MATERIALS INFORMATICS

Mina Yoon, Center for Nanophase Materials Science, Oak Ridge National Laboratory, USA; **Sergey Levchenko**, Skolkovo Institute of Science and Technology, Russia; **Payam Kaghazchi**, Forschungszentrum Jülich GmbH, Germany; **Harald Oberhofer**, Technische Universität München, Germany; **Ghanshyam Pilania**, Los Alamos National Laboratory, USA

S14: FUNCTIONAL MATERIALS FOR BIOLOGICAL APPLICATIONS

Jennifer Andrew, University of Florida, USA; **Julia Glaum**, Norwegian University of Science and Technology, Norway

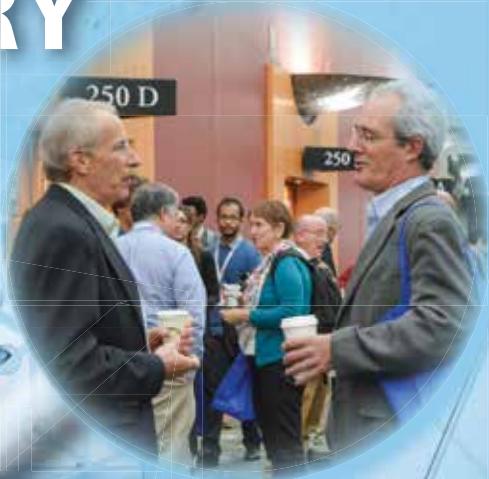
S15: ADVANCED MICROELECTRONICS

Aiping Chen, Los Alamos National Laboratory, USA; **Shinbuhm Lee**, Daegu Gyeongbuk Institute of Science and Technology, Korea; **Tom Harris**, Sandia National Laboratories, USA

The American Ceramic Society Basic Science Division

CONNECT WITH YOUR INDUSTRY

WHO IS THE BASIC SCIENCE DIVISION? As one of 11 Divisions of the American Ceramic Society, we focus on developing foundations of ceramic science and identify new areas of ceramic science critical to our industry for present and future applications.



WHAT'S IN IT FOR YOU

- Connecting with industry professionals
- Meetings, symposia, and related events to stay current
- Access to member resources and industry publications
- Leadership development opportunities
- Awards and recognition
- Access to peer-review journals
 - *Journal of The American Ceramic Society*
 - *International Journal of Applied Ceramic Technology*
 - *International Journal of Applied Glass Science*
 - *International Journal of Ceramic Engineering & Science*

ceramics.org/bsd

WHO IS ACERS? We are an international society serving the engineered ceramic and glass industry with more than 11,000 professional and student members in 70 countries.

For more information contact Erica Zimmerman at ezimmerman@ceramics.org or 614-794-5821.



CALL FOR ABSTRACTS

ABSTRACTS DUE JANUARY 24, 2022

ORGANIZED BY:



PAN AMERICAN CERAMICS CONGRESS AND FERROELECTRICS MEETING OF AMERICAS (PACC-FMAs 2022)

Hilton Panama | Panama City, Panama | July 24-28, 2022

ceramics.org/PACCFMAs

The American Ceramic Society **Electronics Division**

CONNECT WITH YOUR INDUSTRY.

- **WHO IS THE ELECTRONICS DIVISION?** Members focus on electronic materials and devices by exploring emerging areas in nanoscience, energy, and electronic composites.



WHAT'S IN IT FOR YOU

- Connecting with industry professionals
- Meetings, symposia, and related events to stay current
- Access to member resources and industry publications
- Leadership development opportunities
- Awards and recognition
- Access to peer-reviewed journals
 - *Journal of The American Ceramic Society*
 - *International Journal of Applied Ceramic Technology*
 - *International Journal of Applied Glass Science*
 - *International Journal of Ceramic Engineering & Science*



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For more information contact Erica Zimmerman at ezimmerman@ceramics.org or 614-794-5821.

Oral Presenters

Name	Date	Time	Room	Page Number	Name	Date	Time	Room	Page Number					
A														
Abad, G.	19-Jan	12:00PM	Citrus B	7	Fattakhova-Rohlfing, D.	21-Jan	4:00PM	Citrus B	23					
Ahadi, K.	19-Jan	2:00PM	Cypress B	8	Feng, B.	20-Jan	10:45AM	Cypress B	16					
Ahmadi, E.	20-Jan	5:00PM	Citrus B	15	Feteira, A.	21-Jan	12:15PM	Cypress C	20					
Ali, M.	19-Jan	4:30PM	Orange B	8	Fields, S.	21-Jan	9:00AM	Orange A	17					
Almishal, S.S.	20-Jan	3:15PM	Orange A	14	Flint, M.N.	19-Jan	12:15PM	Magnolia A	4					
Andrews, J.	19-Jan	3:15PM	Citrus A	6	Forstmeier, M.K.	21-Jan	3:15PM	Citrus A	22					
Arcon, D.	19-Jan	12:00PM	Orange B	8	Fujii, I.	20-Jan	10:00AM	Citrus A	11					
B														
Basaula, D.	21-Jan	3:15PM	Cypress B	19	Garcia, J.M.	19-Jan	5:15PM	Magnolia B/C	9					
Behler, K.D.	19-Jan	4:00PM	Magnolia B/C	9	Gattinoni, C.	20-Jan	4:30PM	Magnolia A	13					
Belhadj, J.	21-Jan	9:45AM	Orange A	18	Ghosh, A.	21-Jan	12:45PM	Citrus B	23					
Bergmann, F.	21-Jan	3:00PM	Citrus A	22	Ghosh, A.	21-Jan	3:45PM	Citrus B	23					
Bhattacharya, A.	19-Jan	2:00PM	Orange A	6	Gibson, J.	19-Jan	3:15PM	Citrus B	7					
Bhattacharya, R.	19-Jan	4:30PM	Orange A	6	Gliebe, K.	19-Jan	3:15PM	Orange A	6					
Bishop, S.	20-Jan	4:15PM	Citrus A	12	Gong, C.	20-Jan	10:00AM	Orange B	15					
Biswas, A.	21-Jan	10:30AM	Cypress B	19	Gorman, B.P.	19-Jan	10:30AM	Magnolia B/C	9					
Bornitz, M.	20-Jan	3:00PM	Cypress B	16	Grady, Z.	21-Jan	9:45AM	Magnolia A	21					
Bortis, A.	20-Jan	10:30AM	Magnolia A	12	Greenslit, M.	20-Jan	10:30AM	Citrus A	11					
Bosworth, B.T.	21-Jan	9:15AM	Citrus A	21	Grinberg, I.	21-Jan	2:30PM	Cypress C	20					
Botana, A.S.	21-Jan	2:30PM	Orange A	18	Gruber, M.	19-Jan	2:45PM	Magnolia A	4					
Bowman, W.	19-Jan	10:00AM	Magnolia A	4	Gruber, M.	20-Jan	4:30PM	Citrus A	12					
Bowman, W.	19-Jan	11:00AM	Magnolia B/C	9	Guennou, M.	21-Jan	11:30AM	Cypress C	20					
Brahlek, M.	21-Jan	2:00PM	Orange A	18	Guillemet-Fritsch, S.	20-Jan	4:00PM	Citrus A	12					
Brummel, I.A.	21-Jan	9:15AM	Magnolia A	21	Gunes, I.	20-Jan	5:00PM	Citrus A	12					
Bulmer, J.	20-Jan	4:30PM	Orange B	16	H									
Burns, S.R.	20-Jan	5:15PM	Magnolia A	13	Han, Z.	21-Jan	2:30PM	Citrus B	23					
Byun, J.	19-Jan	12:15PM	Citrus B	7	Haugan, T.J.	21-Jan	9:30AM	Orange B	19					
C														
Cann, D.	19-Jan	10:00AM	Citrus A	5	Hayden, J.	19-Jan	10:30AM	Citrus A	5					
Catalan, G.	19-Jan	10:00AM	Orange A	6	Hennig, R.G.	20-Jan	10:00AM	Citrus B	14					
Celuch, M.	21-Jan	8:45AM	Citrus A	21	Hill, M.D.	21-Jan	4:15PM	Citrus A	22					
Chang, Y.	19-Jan	2:00PM	Citrus A	5	Hong, S.	20-Jan	4:30PM	Magnolia B/C	17					
Chen, A.	20-Jan	10:00AM	Magnolia B/C	16	Hong, X.	20-Jan	2:30PM	Orange A	14					
Chen, A.	20-Jan	11:15AM	Orange A	14	Hoque, M.	19-Jan	11:45AM	Magnolia B/C	9					
Chen, P.	20-Jan	12:00PM	Magnolia A	12	Htet, C.S.	19-Jan	5:00PM	Magnolia A	5					
Chu, Y.	21-Jan	2:45PM	Cypress B	19	Hu, J.	19-Jan	4:30PM	Citrus A	6					
Cirillo, M.	20-Jan	5:00PM	Orange B	16	Huang, H.	20-Jan	5:30PM	Citrus B	15					
Cleri, A.	21-Jan	3:15PM	Orange A	18	Huang, P.	19-Jan	11:15AM	Magnolia A	4					
Co, K.	21-Jan	11:30AM	Cypress B	19	Huey, B.	19-Jan	11:30AM	Orange A	6					
Colfer, L.	20-Jan	10:45AM	Magnolia A	12	Hwang, J.	21-Jan	10:45AM	Magnolia A	21					
Comes, R.B.	21-Jan	8:30AM	Orange A	17	I									
Conroy, M.	20-Jan	11:15AM	Magnolia A	12	Ideue, T.	20-Jan	11:00AM	Orange B	15					
Conry, B.	19-Jan	2:45PM	Magnolia B/C	9	Ihlefeld, J.	20-Jan	2:00PM	Magnolia B/C	17					
Cooper, V.R.	21-Jan	2:00PM	Cypress C	20	Ihrig, M.	21-Jan	10:30AM	Magnolia A	21					
D														
Dancer, C.E.	19-Jan	5:00PM	Magnolia B/C	9	Ivry, Y.	21-Jan	8:30AM	Cypress B	18					
Deng, L.	19-Jan	2:30PM	Orange B	8	J									
Ding, H.	19-Jan	10:45AM	Magnolia A	4	Jacobson, V.	20-Jan	12:15PM	Citrus A	11					
Dong, Y.	19-Jan	2:45PM	Cypress B	8	Jalan, B.	19-Jan	11:15AM	Citrus B	7					
Donovan, B.F.	19-Jan	11:15AM	Citrus A	5	Jaramillo, R.	19-Jan	2:00PM	Citrus B	7					
Du, Y.	21-Jan	2:00PM	Cypress B	19	Jaszewski, S.T.	20-Jan	2:45PM	Magnolia A	13					
Dubey, A.	19-Jan	5:15PM	Magnolia A	5	Jin, Y.	20-Jan	11:30AM	Citrus B	14					
E														
Efe, I.	20-Jan	11:00AM	Magnolia A	12	Kadosh, T.	19-Jan	10:00AM	Cypress B	8					
Eichfeld, D.A.	19-Jan	11:00AM	Magnolia A	4	Kafle, A.P.	21-Jan	9:30AM	Magnolia A	21					
Eisenbach, M.	21-Jan	8:30AM	Citrus B	22	KANG, H.	19-Jan	4:00PM	Citrus B	7					
Elangovan, H.	21-Jan	11:15AM	Cypress B	19	Kang, S.	21-Jan	11:45AM	Citrus B	22					
Enright, L.	21-Jan	9:45AM	Citrus A	21	Kaspar, T.	20-Jan	11:15AM	Cypress B	16					
Esteves, G.	21-Jan	2:15PM	Citrus A	22	Kawasaki, J.	19-Jan	10:00AM	Citrus B	7					
F														
Falsi, L.	21-Jan	8:30AM	Cypress C	20	Keeney, L.	19-Jan	2:00PM	Magnolia A	4					
Fan, Z.	20-Jan	11:30AM	Cypress B	16	Kelley, K.	20-Jan	5:30PM	Magnolia A	13					
Fang, X.	19-Jan	2:30PM	Magnolia A	4	Kim, S.	19-Jan	2:30PM	Citrus A	5					
Farghadany, E.	21-Jan	11:30AM	Orange A	18	Kioupakis, E.	20-Jan	2:00PM	Citrus B	15					
					Klomp, A.J.	19-Jan	3:30PM	Magnolia A	5					
					Klomp, A.J.	20-Jan	5:00PM	Magnolia A	13					

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Oral Presenters

Name	Date	Time	Room	Page Number	Name	Date	Time	Room	Page Number					
Knight, M.	19-Jan	3:00PM	Magnolia A	4	Pai, Y.	19-Jan	2:45PM	Citrus B	7					
Kohnert, A.A.	20-Jan	11:45AM	Cypress B	16	Papac, M.C.	21-Jan	11:00AM	Citrus A	21					
Komatsu, N.	20-Jan	2:00PM	Orange B	15	Park, M.	21-Jan	8:45AM	Cypress B	18					
Kong, J.	19-Jan	3:15PM	Magnolia A	4	Parker, D.	19-Jan	11:30AM	Orange B	8					
Koruza, J.	20-Jan	11:30AM	Citrus A	11	Patterson, E.	20-Jan	12:00PM	Citrus A	11					
Kotsonis, G.N.	20-Jan	5:00PM	Orange A	14	Paudel, B.	21-Jan	2:30PM	Cypress B	19					
Kumah, D.P.	19-Jan	4:00PM	Cypress B	9	Pearton, S.	20-Jan	2:30PM	Citrus B	15					
Kumar, A.	19-Jan	10:30AM	Magnolia A	4	Peng, W.	21-Jan	2:45PM	Citrus A	22					
Kunwar, S.	20-Jan	3:15PM	Magnolia B/C	17	Perez, C.	20-Jan	10:30AM	Citrus B	14					
Kutnjak, Z.	20-Jan	11:00AM	Citrus A	11	Perry, N.H.	19-Jan	3:00PM	Cypress B	8					
L														
Lanceros-Mendez, S.	20-Jan	2:00PM	Cypress B	16	Phommakesone, S.	21-Jan	11:30AM	Citrus A	22					
Lau, C.	19-Jan	5:00PM	Orange B	8	Pramanick, A.	21-Jan	10:30AM	Cypress C	20					
LeBeau, J.	19-Jan	11:00AM	Cypress B	8	Prasad, B.	21-Jan	9:30AM	Cypress B	19					
Lee, J.	19-Jan	4:30PM	Citrus B	7	R									
Lee, J.	20-Jan	4:00PM	Magnolia B/C	17	Raju, K.J.	19-Jan	10:45AM	Citrus A	5					
Lekawa-Raus, A.	20-Jan	2:30PM	Orange B	15	Randall, C.	19-Jan	2:00PM	Magnolia B/C	9					
Liu, B.	20-Jan	11:15AM	Citrus A	11	Randall, C.	20-Jan	10:00AM	Cypress B	16					
Liu, J.	19-Jan	4:30PM	Magnolia A	5	Ray, U.	21-Jan	10:30AM	Citrus A	21					
Liu, J.	20-Jan	2:00PM	Orange A	14	Ren, G.	19-Jan	2:30PM	Citrus B	7					
Liu, R.	19-Jan	4:45PM	Orange A	6	Reuter, K.	21-Jan	10:30AM	Citrus B	22					
liu, w.	19-Jan	3:00PM	Orange B	8	Richtik, B.N.	21-Jan	8:45AM	Magnolia A	21					
Liu, Y.	19-Jan	2:30PM	Magnolia B/C	9	Riedl, C.	19-Jan	2:45PM	Orange A	6					
Liu, Y.	21-Jan	2:45PM	Citrus B	23	Roccapirore, K.M.	19-Jan	11:45AM	Magnolia A	4					
Lortz, R.W.	19-Jan	4:00PM	Orange B	8	Roccapirore, K.M.	21-Jan	11:00AM	Orange A	18					
Lu, J.	20-Jan	11:00AM	Orange A	13	Rossi, D.J.	20-Jan	5:15PM	Orange A	14					
Lue, C.	19-Jan	10:00AM	Orange B	7	Rost, C.M.	20-Jan	4:30PM	Orange A	14					
Lupascu, D.C.	19-Jan	5:00PM	Citrus A	6	Rowe, T.	19-Jan	12:00PM	Citrus A	5					
M														
MacManus-Driscoll, J.	20-Jan	2:45PM	Magnolia B/C	17	Rozic, B.	21-Jan	9:30AM	Cypress C	20					
Mannodi-Kanakkithodi, A.	21-Jan	2:00PM	Citrus B	23	Ryu, G.	20-Jan	2:30PM	Magnolia A	13					
Manzhos, S.	21-Jan	9:00AM	Citrus B	22	Ryu, S.	21-Jan	9:15AM	Orange A	17					
Martin, A.	20-Jan	4:45PM	Citrus A	12	S									
Martin, L.W.	21-Jan	10:45AM	Cypress B	19	Saidi, W.	21-Jan	9:30AM	Citrus B	22					
Maurer, R.	21-Jan	12:00PM	Citrus B	22	Sarott, M.F.	20-Jan	4:15PM	Magnolia A	13					
Mazza, A.R.	21-Jan	3:00PM	Orange A	18	Scarpulla, M.	20-Jan	4:00PM	Citrus B	15					
Milich, M.	21-Jan	9:00AM	Magnolia A	21	Sebastian, M.	21-Jan	10:30AM	Orange B	20					
MIMURA, T.	20-Jan	4:00PM	Magnolia A	13	Seo, A.	20-Jan	4:00PM	Orange A	14					
Mohammed, A.Z.	21-Jan	12:00PM	Orange A	18	Shi, J.	19-Jan	4:45PM	Magnolia A	5					
Moore, R.	19-Jan	11:00AM	Citrus B	7	Shi, J.	20-Jan	2:30PM	Citrus A	11					
Morrison, F.D.	19-Jan	4:00PM	Magnolia A	5	Shrestha, S.	19-Jan	5:00PM	Orange A	7					
Mraz, A.	20-Jan	10:30AM	Magnolia B/C	17	Shvilberg, L.	20-Jan	2:30PM	Magnolia B/C	17					
Mudd, S.	19-Jan	3:00PM	Citrus A	5	Siebenhofer, M.	19-Jan	10:45AM	Cypress B	8					
Myers, C.	21-Jan	10:45AM	Orange B	20	Singh, A.	19-Jan	10:00AM	Magnolia B/C	9					
N														
Nagatani, T.	20-Jan	3:15PM	Citrus A	12	Singh, A.K.	21-Jan	11:00AM	Citrus B	22					
Nakamura, A.	19-Jan	4:45PM	Cypress B	9	Skidmore, C.	21-Jan	11:45AM	Orange A	18					
Nakhmanson, S.	21-Jan	4:00PM	Citrus A	22	Smith, T.	19-Jan	10:30AM	Citrus B	7					
nemati, A.	20-Jan	3:00PM	Citrus A	12	SONG, J.	21-Jan	11:45AM	Cypress B	19					
nemati, A.	21-Jan	8:30AM	Magnolia A	21	Spangler, R.	20-Jan	2:15PM	Citrus A	11					
Neuman, E.	19-Jan	11:00AM	Citrus A	5	Spreitzer, M.	21-Jan	9:15AM	Cypress B	19					
Nguyen, P.	19-Jan	10:45AM	Citrus B	7	Spurling, R.	20-Jan	2:00PM	Citrus A	11					
Nino, J.	19-Jan	4:30PM	Magnolia B/C	9	Srivastava, S.	19-Jan	4:30PM	Cypress B	9					
Noordhoek, K.	21-Jan	9:30AM	Orange A	18	Staruch, M.	19-Jan	11:45AM	Citrus A	5					
Nordlander, J.	19-Jan	11:45AM	Citrus B	7	Sternlicht, H.	19-Jan	11:30AM	Magnolia B/C	9					
Nordlander, J.	20-Jan	10:00AM	Magnolia A	12	Strkalj, N.	20-Jan	11:45AM	Magnolia A	12					
O														
Oh, S.	20-Jan	11:00AM	Citrus B	14	Suh, D.	21-Jan	11:30AM	Citrus B	22					
Ohta, H.	20-Jan	2:45PM	Orange A	14	Sumption, M.D.	20-Jan	12:00PM	Orange B	15					
Olsen, T.	19-Jan	5:15PM	Citrus A	6	Sumption, M.D.	21-Jan	4:00PM	Orange B	16					
Orloff, N.	21-Jan	8:30AM	Citrus A	21	Sun, N.	21-Jan	8:30AM	Orange B	19					
Orloff, N.	21-Jan	12:00PM	Citrus A	22	Surta, W.	20-Jan	3:30PM	Cypress B	16					
Orloff, N.	21-Jan	2:00PM	Citrus A	22	Susner, M.A.	20-Jan	9:00AM	Cypress C	20					
Orloff, N.	21-Jan	4:30PM	Citrus A	22	Tanaka, H.	20-Jan	11:30AM	Orange B	15					
Ortiz, L.	20-Jan	10:45AM	Citrus B	14	Tolbert, S.	19-Jan	8:40AM	Citrus A	12					
Osofsky, M.	21-Jan	9:00AM	Orange B	19	Tolchin, M.	20-Jan	12:00PM	Orange A	4					
T														

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Name	Date	Time	Room	Page Number	Name	Date	Time	Room	Page Number
Tomko, J.	21-Jan	11:15AM	Orange A	18					
Trolier-McKinstry, S.	19-Jan	10:15AM	Cypress B	8	Yang, J.	20-Jan	11:00AM	Magnolia B/C	17
Trolier-McKinstry, S.	20-Jan	2:00PM	Magnolia A	13	Yang, M.	19-Jan	10:45AM	Orange A	6
		U			Yeom, S.	21-Jan	12:30PM	Citrus B	23
Ullah, A.	20-Jan	5:30PM	Orange B	16	Yildiz, B.	20-Jan	8:40AM	Orange A	11
		V			Yin, J.	19-Jan	10:30AM	Orange B	8
Valentine, T.	20-Jan	4:45PM	Orange A	14	Yoo, T.J.	20-Jan	4:30PM	Citrus B	15
Villa, L.	19-Jan	2:30PM	Cypress B	8	Yoon, S.	21-Jan	10:30AM	Orange A	18
		W			Yoshimura, M.	20-Jan	2:30PM	Cypress B	16
Wang, G.	21-Jan	11:45AM	Cypress C	20	Yousefian, P.	20-Jan	10:30AM	Cypress B	16
Wang, J.	20-Jan	10:45AM	Orange A	13	Yu, H.	20-Jan	10:15AM	Magnolia B/C	17
Wang, L.	20-Jan	10:00AM	Orange A	13	Yu, W.	20-Jan	3:00PM	Orange B	16
Wang, Q.	20-Jan	11:45AM	Magnolia B/C	17					
Webb, M.	20-Jan	10:30AM	Orange A	13	Z				
Wei, Y.	20-Jan	3:00PM	Magnolia A	13	Zanca, B.	21-Jan	11:00AM	Magnolia A	21
Wheeler, V.	20-Jan	3:00PM	Citrus B	15	ZHAI, H.	19-Jan	11:00AM	Orange B	8
Wickramaratne, D.	19-Jan	2:00PM	Orange B	8	Zhang, D.	19-Jan	3:00PM	Orange A	6
Wollmershauser, J.	19-Jan	5:30PM	Magnolia B/C	9	Zhang, H.	19-Jan	4:00PM	Orange A	6
Wu, R.	21-Jan	2:45PM	Orange A	18	Zheng, T.	19-Jan	4:00PM	Citrus A	6
		X			Zhu, M.	19-Jan	12:00PM	Magnolia A	4
Xia, X.	20-Jan	2:45PM	Citrus B	15	Zhu, M.	20-Jan	3:00PM	Orange A	14
Xiang, R.	20-Jan	10:30AM	Orange B	15	Zhuo, Y.	20-Jan	11:30AM	Magnolia B/C	17
Xiao, M.	20-Jan	10:45AM	Magnolia B/C	17					

Poster Presenters

Name	Date	Time	Room	Page Number	Name	Date	Time	Room	Page Number
		A					L		
Anguish, E.	19-Jan	5:30PM	Orange C/D	10	Lee, J.	19-Jan	5:30PM	Orange C/D	10
		C					M		
Cho, H.	19-Jan	5:30PM	Orange C/D	10	Mahmoudvand, M.	19-Jan	5:30PM	Orange C/D	10
Cho, S.	19-Jan	5:30PM	Orange C/D	10			P		
		D			Park, S.	19-Jan	5:30PM	Orange C/D	10
Dolgos, M.	19-Jan	5:30PM	Orange C/D	10	Potticary, J.J.	19-Jan	5:30PM	Orange C/D	10
		F			Powers Beggs, B.	19-Jan	5:30PM	Orange C/D	10
Frostad, J.	19-Jan	5:30PM	Orange C/D	10			R		
		G			Riedl, C.	19-Jan	5:30PM	Orange C/D	10
Gliebe, K.	19-Jan	5:30PM	Orange C/D	10			S		
Graham, N.A.	19-Jan	5:30PM	Orange C/D	10	Sangwan, V.	19-Jan	5:30PM	Orange C/D	10
		H			Siebenhofer, M.	19-Jan	5:30PM	Orange C/D	10
Hirt, B.	19-Jan	5:30PM	Orange C/D	10	Smith, H.B.	19-Jan	5:30PM	Orange C/D	10
Hoseini Makrem, S.	19-Jan	5:30PM	Orange C/D	10			W		
Huang, S.	19-Jan	5:30PM	Orange C/D	11	Wang, G.	19-Jan	5:30PM	Orange C/D	10
		J					Y		
Jeong, D.	19-Jan	5:30PM	Orange C/D	11	Yoo, S.	19-Jan	5:30PM	Orange C/D	10
Johnson, K.E.	19-Jan	5:30PM	Orange C/D	10			Z		
		K			Zhang, Z.	19-Jan	5:30PM	Orange C/D	10
Kang, M.	19-Jan	5:30PM	Orange C/D	10					
Kim, S.	19-Jan	5:30PM	Orange C/D	10					
Kroell, E.	19-Jan	5:30PM	Orange C/D	10					
Kunwar, S.	19-Jan	5:30PM	Orange C/D	11					

Wednesday, January 19, 2022

Plenary Sessions

Plenary Session I

Room: Orange A

Session Chair: Jennifer Andrew, University of Florida

8:30 AM

Opening Remarks and Speaker Introduction

8:40 AM

(EMA-PLEN-001-2022) Solution Processed Nanoporous and Nanocrystal Based Magnetoelectric Materials

S. Tolbert^{*1}

1. UCLA, Department of Chemistry and Biochemistry, USA

9:30 AM

Break

S1: Characterization of Structure–Property Relationships in Functional Ceramics

Advances in Scattering, Imaging, and Analytical Techniques

Room: Magnolia A

Session Chairs: James LeBeau, Massachusetts Institute of Technology; David McComb, The Ohio State University

10:00 AM

(EMA-001-2022) Towards characterization of the evolution of an electroceramic grain boundary network during thermal processing by in situ scanning transmission electron microscopy (Invited)

W. Bowman^{*1}; J. L. Wardini¹

1. University of California, Irvine, Materials Science and Engineering, USA

10:30 AM

(EMA-002-2022) Evolution of polar domains with epitaxial strain in relaxor-ferroelectric PMN-PT thin films

A. Kumar^{*1}; J. Kim²; L. W. Martin²; J. LeBeau¹

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

2. University of California, Berkeley, Materials Science and Engineering, USA

10:45 AM

(EMA-003-2022) Atomically resolved intermediate phase in sodium niobate

H. Ding^{*1}; N. Hadaeghi¹; E. Adabifiroozjaei¹; L. Carstensen¹; T. Jiang¹; W. Donner¹; H. Zhang¹; H. Kleebe¹; L. Molina-Luna¹

1. Technical University Darmstadt, Materials Science, Germany

11:00 AM

(EMA-004-2022) Spatially Mapping Mechanical & Thermal Properties of Epitaxially-Grown Graphene with Sub-Micron Lateral Resolution

D. A. Eichfeld^{*2}; R. A. Maniyara²; J. Robinson²; B. M. Foley¹

1. The Pennsylvania State University, Mechanical Engineering, USA

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

11:15 AM

(EMA-005-2022) Measuring Atomic Scale Magnetization in a Metallic Antiferromagnet via 4D-STEM (Invited)

K. Nguyen¹; J. Huang¹; M. Karigerasi¹; K. Kang¹; A. Schleife¹; D. Cahill¹; D. Shoemaker¹; J. Zuo¹; P. Huang^{*1}

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

11:45 AM

(EMA-006-2022) Autonomous experiment in the electron microscope guided by actively learning structure-property relationships in STEM-EELS

K. M. Roccapirore^{*1}; S. Kalinin¹; M. Ziatdinov¹

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

12:00 PM

(EMA-007-2022) Quantifying Temperature Susceptivity of Electron Scattering in Scanning Transmission Electron Microscopy

M. Zhu^{*1}; J. Hwang¹

1. Ohio State University, Material Science and Engineering, USA

12:15 PM

(EMA-008-2022) In-Situ and In-Operando Study of Electrochemical Strain in MnO₂ nanosheet electrodes

M. N. Flint^{*1}; P. Metz¹; P. Gao¹; R. Koch¹; S. T. Misture²

1. Alfred University, School of Engineering, USA

2. Alfred University, MSE, USA

Addressing Open Questions in Functional Ceramics

Room: Magnolia A

Session Chairs: David McComb, The Ohio State University; James LeBeau, Massachusetts Institute of Technology

2:00 PM

(EMA-042-2022) Probing the influence of defects and interfaces on the multiferroic behavior of layered Aurivillius phase thin films (Invited)

L. Colfer²; N. Bagués³; K. Moore⁴; E. O Connell⁴; S. Griffin⁵; M. Schmidt²; C. Downing⁶

V. Nicolis⁶; U. Bangert⁴; M. Conroy⁷; D. W. McComb⁵; L. Keeney^{*1}

1. Tyndall National Institute, University College Cork, Advanced Materials and Surfaces Group, Ireland

2. Tyndall National Institute, Ireland

3. The Ohio State University, Center for Electron Microscopy and Analysis, USA

4. Bernal Institute, University of Limerick, Department of Physics, Ireland

5. Molecular Foundry, Lawrence Berkeley National Laboratory, USA

6. Trinity College Dublin, Advanced Microscopy Laboratory & AMBER, Ireland

7. Imperial College London, Department of Materials, Royal School of Mines, United Kingdom

8. The Ohio State University, USA

2:30 PM - WITHDRAWN

(EMA-043-2022) Mechanical tailoring of dislocation density in SrTiO₃ at room temperature via cyclic loading

X. Fang^{*1}; C. Okafor¹; K. Ding¹; X. Zhou¹; K. Durst¹; J. Rödel¹

1. Technical University of Darmstadt, Germany

2:45 PM - WITHDRAWN

(EMA-044-2022) - Small-scale mechanical characterization of LiTaO₃ and LiNbO₃ single crystals for SAW filters

M. Gruber^{*1}; D. Kiener²; P. Supancic¹; R. Bermejo¹

1. University of Leoben, Institute of Structural and Functional Ceramics, Austria

2. University of Leoben, Department of Materials Physics, Austria

3:00 PM

(EMA-045-2022) Lightly Fe-doped Polycrystalline Strontium Titanate: Tracking Fe Valence Changes Upon Sintering

M. Knight^{*1}; I. Reimanis¹; A. Meyer¹; J. Preusker²; W. Rheinheimer³

1. Colorado School of Mines, USA

2. Karlsruhe Institute of Technology, Germany

3. Forschungszentrum Juelich, Germany

3:15 PM

(EMA-046-2022) Point defect induced dipole moments in KCa₂Nb₃O₁₀ Dion-Jacobson layered perovskites

J. Kong^{*1}; S. Nayak²; K. Co³; S. Nayak⁴; J. Wu¹; A. Feteira²; B. Kevin A⁵; P. Alpay³; A. Pramanick¹

1. City University of Hong Kong, Materials science and engineering, Hong Kong

2. Sheffield Hallam University, United Kingdom

3. University of Connecticut, Department of Materials Science and Engineering, USA

4. Indian Institute of Technology Madras, Department of Physics, India

5. Advanced Photon Sourc, USA

Final Program

Wednesday, January 19, 2022

3:30 PM

(EMA-047-2022) Clarifying dislocation structures in strontium titanate using atomistic simulations

A. J. Klomp^{*1}; L. Porz¹; K. Albe²
1. TU Darmstadt, Materials Science, Germany
2. Technical University Darmstadt, Fachgebiet Materialmodellierung, Germany

3:45 PM

Break

Advances in Connecting Local and Global Structure to Properties

Room: Magnolia A

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

4:00 PM

(EMA-048-2022) Neutron diffraction studies of phase transitions in improper and incommensurate ferroelectrics (Invited)

F. D. Morrison^{*1}
1. University of St Andrews, Chemistry, United Kingdom

4:30 PM

(EMA-049-2022) Integration of BaZrO₃-Co vertically aligned nanocomposite on mica substrates towards flexible spintronics

J. Liu^{*1}; X. Wang¹; X. Gao¹; H. Wang¹; B. Zhang¹; D. Zhang²; M. Kalaswad¹; J. Huang¹; H. Wang³
1. Purdue University, USA
2. Purdue University, Materials Engineering, USA
3. Purdue University, School of Materials Engineeringn, USA

4:45 PM

(EMA-050-2022) Variations in the electronic structure and spin states in La_{1-x}Sr_xCoO₃

J. Shi^{*1}; H. Zhang²
1. Xiamen University, Department of Chemistry, China
2. Xiamen University, College of Chemistry and Chemical Engineering, China

5:00 PM

(EMA-051-2022) Atomic mechanisms for phase transitions in antiferroelectric NaNbO₃ studied by X-ray and neutron scattering

C. S. Htet^{*6}; S. Nayak²; J. Kong¹; L. Jue³; A. M. Manjon Sanz²; F. Marlton⁴; D. Sørensen⁵; M. Jørgensen⁵; A. Pramanick¹
1. City University of Hong Kong, Material science and engineering, Hong Kong
2. Department of Physics, Indian Institute of Technology Madras, India
3. Neutrons Scattering Division, Oak Ridge National Laboratory, Oak Ridge, USA
4. University of Sydney, Department of Chemistry, Australia
5. Aarhus University, Center for Materials Crystallography, Department of Chemistry and iNANO, Denmark
6. City University of Hong Kong, Material science and engineering, Hong Kong

5:15 PM

(EMA-052-2022) Role of Cooperative Factors in the Photocatalytic Activity of Ba and Mn Doped BiFeO₃ Nanoparticles

A. Dubey^{*1}; A. Schmitz²; S. V. Vladimir¹; G. Bacher²; D. C. Lupascu¹; M. E. Castillo¹
1. University of Duisburg-Essen, Institute for Materials Science and Center for Nanointegration Duisburg-Essen (CENIDE), Germany
2. University of Duisburg Essen, Werkstoffe der Elektrotechnik and CENIDE, Germany

S2: Advanced Electronic Materials: Processing Structures, Properties, and Applications

Advanced Electronic Materials, including Ferroelectric, Piezoelectric, Dielectric, Electrostrictive, and Pyroelectric Materials I

Room: Citrus A

Session Chair: Brian Donovan, U.S. Naval Academy; Jiamian Hu, University of Wisconsin-Madison

10:00 AM - WITHDRAWN

(EMA-009-2022) Design of Actuators Based on Relaxor-Ferroelectric Crossover (Invited)

D. Cann^{*1}; S. Gupta¹; B. Gibbons¹; P. Mardilovich²
1. Oregon State University, USA
2. aixACCT Systems GmbH, Germany

*Denotes Presenter

10:30 AM

(EMA-010-2022) Critical processing parameters for sputtered ferroelectric AlBN thin films

J. Hayden^{*1}; J. Maria¹
1. Pennsylvania State University, Materials Science and Engineering, USA

10:45 AM

(EMA-011-2022) Full depth Crystallization of (Ba,Sr)TiO₃ thin films at 300°C with laser and their microwave range characteristics

K. J. Raju^{*1}
1. University of Hyderabad, Physics, India

11:00 AM

(EMA-012-2022) Effect of B-Site Cation Ratio on Properties of Sn-modified PZT 95/5

E. Neuman^{*1}; N. Anselmo¹; A. Meyer¹; C. Diantonio¹; M. Rodriguez¹; R. Torres¹; B. Brane¹
1. Sandia National Laboratories, USA

11:15 AM

(EMA-013-2022) Understanding Thermal Transport between Amorphous GeTe and Crystalline GeTe (Invited)

B. F. Donovan^{*1}; T. Gray¹; R. J. Warzoha¹; J. Champlain²; L. Ruppalt²; A. Giri³
1. United States Naval Academy, USA
2. Naval Research Labs, USA
3. University of Rhode Island, USA

11:45 AM

(EMA-014-2022) Acoustic Energy Harvesting of Piezoelectric 1-3 Composites

J. Figueira²; M. Staruch^{*1}
1. U.S. Naval Research Laboratory, USA
2. St. Mary's University, Physics, USA

12:00 PM

(EMA-015-2022) Synthesis and Characterization of a Novel Ferroelectric Solid Solution

T. Rowe^{*1}; M. Dolgos¹
1. University of Calgary, Canada

Advanced Electronic Materials, including Ferroelectric, Piezoelectric, Dielectric, Electrostrictive, and Pyroelectric Materials II

Room: Citrus A

Session Chair: Margo Staruch, U.S. Naval Research Laboratory

2:00 PM

(EMA-053-2022) Enhanced piezoelectric response and superior temperature stability of tetragonal (Ba, Ca)(Zr, Ti)O₃ textured ceramics (Invited)

Q. Kou¹; B. Yang¹; Y. Sun¹; S. Yang²; L. Liu¹; H. Xie¹; S. Zhang³; F. Li²; Y. Chang^{*1}
1. Harbin Institute of Technology, China
2. Xi'an Jiaotong University, China
3. Nanjing University, China

2:30 PM

(EMA-054-2022) Role of A-site cation off-centering in perovskite pseudo-cubic structure of Bi-based piezoelectrics. (Invited)

S. Kim^{*1}; H. Nam²; I. Fujii²; S. Ueno²; c. moriyoshi¹; Y. Kuroiwa¹; S. Wada²
1. Hiroshima University, Japan
2. University of Yamanashi, Japan

3:00 PM

(EMA-055-2022) Novel family of n-type oxide thermoelectric materials based on La_{1.5-x}Eu_xSr_{0.775}TiO_{3-δ} made using an ionic liquid synthesis

S. Mudd^{*1}; R. Boston²; E. A. Casanas¹
1. University of Sheffield, Materials Science and Engineering, United Kingdom
2. University of Sheffield, Materials Science and Engineering, United Kingdom

Final Program

Wednesday, January 19, 2022

3:15 PM

(EMA-056-2022) Reactive cold sintering of (Na,Ba)(Nb,Ti)O₃

J. Andrews^{*1}; R. Boston¹

1. University of Sheffield, Department of Materials Science and Engineering, United Kingdom

3:30 PM

Break

4:00 PM

(EMA-057-2022) Electrical Property Modification and Physical Mechanism Investigation of KNN-based Lead-free Piezoceramics (Invited)

T. Zheng^{*1}

1. Sichuan University, China

4:30 PM

(EMA-058-2022) Phase-field modeling of domain structure and piezoresponse in ferroelectric nanotubes (Invited)

S. Zhuang¹; M. Li¹; M. Zhang¹; A. Ross¹; J. Hu^{*1}

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

5:00 PM

(EMA-059-2022) Dielectric properties of hybrid perovskites

D. C. Lupascu^{*2}; A. Karabanov¹; Y. Jin¹; A. Farooq¹; K. Winkler¹; N. Benson³

1. University of Duisburg-Essen, Institute for Materials Science, Germany
2. University of Duisburg-Essen, Institute for Materials Science and CENIDE, Germany
3. University of Duisburg-Essen, Institute of Technology for Nanostructures, Germany

5:15 PM

(EMA-060-2022) Effects of Ion Irradiation on Amorphous and Anatase TiO₂ Nanotube Anodes for Lithium-ion Batteries

T. Olsen^{*1}; K. A. Smith¹; A. I. Savva²; P. Barnes¹; D. A. Tenne¹; Y. Wang³; C. Yang⁴; K. Hattar²; J. Wharry⁵; H. Xiong³

1. Boise State University, USA
2. Sandia National Laboratories, USA
3. Boise State University, Materials Science and Engineering, USA
4. National Institute of Standards and Technology (NIST), USA
5. Purdue University, USA
6. Los Alamos National Lab, USA
7. Clean Energy Associates (CEA), USA

S4: Complex Oxide Thin Films and Heterostructures: From Synthesis to Strain/Interface-engineered Emergent Properties

Phenomena arising from Strain Couplings and Interface Couplings

Room: Orange A

Session Chair: Judith MacManus-Driscoll, University of Cambridge

10:00 AM

(EMA-016-2022) Embracing gradients (Invited)

G. Catalan^{*1}

1. ICREA and ICN2, Spain

10:45 AM

(EMA-017-2022) Emergent Energy Conversion Effects at Symmetry-Engineered Heterostructures (Invited)

M. Yang^{*1}; M. Alexe¹

1. University of Warwick, Department of Physics, United Kingdom

11:15 AM

(EMA-018-2022) Topological Hall effect like signatures in epitaxial oxide hetero-interface

P. Roy^{*1}; A. Chen²; Q. Jia³

1. University at Buffalo-The State University of New York, Materials Design and Innovation, USA
2. Los Alamos National Lab, USA
3. University at Buffalo, Materials Design and Innovation, USA

11:30 AM - WITHDRAWN

(EMA-019-2022) Piezoresponse and Schottky Currents Throughout Distinct Superlattice Layers via Tomographic AFM

T. J. Moran¹; J. SONG¹; K. Suzuki²; T. Hosokura²; R. Ramesh³; B. Huey^{*1}

1. University of Connecticut, Materials Science and Engineering, USA
2. Murata Manufacturing Co., Ltd., R&D Center for Technology, Japan
3. UC Berkeley, MSE/Physics, USA

In-situ Thin Film Characterization

Room: Orange A

Session Chair: James Rondinelli, Northwestern University

2:00 PM

(EMA-061-2022) Two-dimensional superconductivity at KTaO₃ interfaces (Invited)

A. Bhattacharya^{*1}

1. Argonne National Laboratory, Materials Science Division, USA

2:45 PM

(EMA-062-2022) Performance loss of promising SOFC cathode materials by sub-ppm sulfur poisoning revealed by in-situ PLD and AP-XPS studies

C. Riedl^{*1}; M. Siebenhofer¹; A. Nenning¹; R. Christoph¹; M. Kubicek¹; A. Limbeck¹; A. K. Opitz¹; J. Fleig¹

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

3:00 PM

(EMA-063-2022) Thermally Stable Au-BaTiO₃ Nanoscale Hybrid Metamaterial for High Temperature Plasmonic Applications

D. Zhang^{*1}; Z. Qi¹; J. Jian¹; J. Huang¹; X. Phuah¹; X. Zhang¹; H. Wang²

1. Purdue University, Materials Engineering, USA
2. Purdue University, School of Materials Engineering, USA

3:15 PM

(EMA-064-2022) Advanced analysis of reflection high energy electron diffraction data

K. Giesebe^{*1}; A. Sehirlioglu²

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

3:30 PM

Break

Controlled Synthesis of Lateral and Vertical Heteroepitaxial Thin Films and Nanocomposites I

Room: Orange A

Session Chair: Anand Bhattacharya, Argonne National Laboratory

4:00 PM

(EMA-065-2022) The Electronic Structure of Degenerately N-doped Ga₂O₃ Thin Films (Invited)

H. Zhang^{*1}

1. Xiamen University, College of Chemistry and Chemical Engineering, China

4:30 PM

(EMA-066-2022) Material characterization and contact resistivity of LaCoO₃ grown by optimized DC magnetron sputtering

R. Bhattacharya^{*1}

1. UCLA, Materials Science and Engineering, USA

4:45 PM

(EMA-067-2022) Stress release via crystal rotation in epitaxial crystallization of amorphous complex oxides in complex geometries

R. Liu^{*1}; P. Zuo¹; S. Marks¹; D. Sri Gyan¹; D. E. Savage¹; T. Zhou²; Z. Cai³; M. Holt²; S. E. Babcock¹; T. F. Kuech⁴; P. G. Evans¹

1. University of Wisconsin-Madison, Department of Materials and Engineering, USA

2. Argonne National Lab, Center for Nanoscale Materials, USA

3. Argonne National Lab, Advanced Photon Source, USA

4. University of Wisconsin-Madison, Department of Chemical and Biological Engineering, USA

Final Program

Wednesday, January 19, 2022

5:00 PM

(EMA-068-2022) Nanoscale freestanding Sr₂IrO₄ thin-films for flexible electronics

S. Shrestha^{*1}; M. Coile¹; M. Souris¹; M. Zhu²; J. Kim¹; R. Pandey¹; J. Brill¹; J. Hwang²; J. Kim³; A. Seo¹
1. University of Kentucky, Physics and Astronomy, USA
2. Ohio State University, MATERIALS SCIENCE AND ENGINEERING, USA
3. Argonne National Lab, Advanced photon source, USA

S6: Emerging Semiconductors Materials and Interfaces

Advances in Thin Film Synthesis I

Room: Citrus B

Session Chairs: Rafael Jaramillo, Massachusetts Institute of Technology; Matthew Brahlek, Oak Ridge National Lab

10:00 AM

(EMA-020-2022) Defect seeded lateral epitaxy and exfoliation on graphene terminated surfaces (Invited)

J. Kawasaki^{*1}
1. University of Wisconsin, USA

10:30 AM

(EMA-021-2022) Self-regulated growth of candidate topological superconducting parkerite by molecular beam epitaxy

J. M. Lapano¹; T. Smith^{*2}; Y. Pai¹; A. R. Mazza¹; J. Zhang¹; T. Isaacs-Smith²; P. Gemperline²; L. Zhang¹; H. Li¹; H. Lee¹; G. Eres¹; M. Yoon¹; R. B. Comes⁴; T. Z. Ward¹; B. Lawrie¹; M. McGuire¹; R. Moore¹; C. T. Nelson¹; A. May¹; M. Brahlek¹
1. Oak Ridge National Lab, USA
2. Auburn University, USA
3. University of Tennessee, USA
4. Auburn University, Dept. of Physics, USA

10:45 AM

(EMA-022-2022) Topological Tuning in NiTe_{2-x}Se_x alloys

P. Nguyen^{*1}; H. Nguyen²; T. Trinh²; J. Kim²; J. Lee¹
1. Pusan National University, Department of Physics, Republic of Korea
2. University of Ulsan, Department of Physics, Republic of Korea

11:00 AM

(EMA-023-2022) van der Waals Epitaxy on Freestanding Monolayer Graphene Membranes

J. M. Lapano¹; O. Dyck¹; A. R. Lupini¹; W. Ko¹; H. Li¹; H. Miao¹; H. Lee¹; A. Li¹; M. Brahlek¹; S. Jesse¹; R. Moore^{*1}
1. Oak Ridge National Laboratory, USA

11:15 AM

(EMA-024-2022) MBE Growth, Defect and Electronic Transport in Alkaline Earth Stannates (Invited)

B. Jalan^{*1}
1. University of Minnesota, USA

11:45 AM

(EMA-025-2022) Sputter Deposition of InN Thin Films for IR Plasmonic Applications

J. Nordlander^{*1}; A. Cleri¹; J. Hayden¹; E. Runnerstrom²; J. Maria¹
1. Penn-State University, USA
2. US Army Research Laboratory, USA

12:00 PM - WITHDRAWN

(EMA-026-2022) In-situ investigation of the interface formation of Si-terminated diamond and a Nb₂O₅ electron acceptor layer for electronic applications

G. Abad^{*1}; S. McDonnell¹
1. University of Virginia, Materials Science and Engineering, USA

12:15 PM

(EMA-027-2022) Novel Stabilization Mechanism on Polar Oxide Surface

J. Byun^{*1}; Z. Wang²; S. Oh²; J. Lee¹
1. Pusan National University, Department of Physics, Republic of Korea
2. SungKyunKwan University, Department of Energy Science, Republic of Korea

Advances in Thin Film Synthesis II

Room: Citrus B

Session Chairs: Jason Kawasaki, University of Wisconsin

2:00 PM

(EMA-069-2022) Making Chalcogenide Perovskite Semiconductor Thin Films on Oxide Perovskite Substrates by Gas-Source Molecular Beam Epitaxy (Invited)

R. Jaramillo^{*1}
1. Massachusetts Institute of Technology, USA

2:30 PM

(EMA-070-2022) Phase stability and optical property of quasi-one-dimensional BaTiS₃

G. Ren^{*1}; B. Zhao²; A. Thind¹; T. Cao¹; J. Cavin⁴; J. Ravichandran²; R. Mishra³
1. Washington University in St.Louis, Institute of Materials Science and Engineering, USA
2. University of Southern California, Chemical Engineering and Material Science, USA
3. Washington University in St. Louis, Mechanical Engineering & Materials Science, USA
4. Washington University in St. Louis, Department of Physics, USA

2:45 PM

(EMA-071-2022) Optically Probing Quantum Spin Liquid Candidates and Toward Quantum Enhanced Optical Sensing (Invited)

Y. Pai^{*1}
1. Oak Ridge National Lab, Materials Science and Technology Div., USA

3:15 PM

(EMA-072-2022) Genetic Algorithm Structure Search for Epitaxial Growth Conditions of Cs-Sb Photocathodes on SiC(100)

J. Gibson^{*1}; R. G. Hennig¹
1. University of Florida, Material Science and Engineering, USA

3:30 PM

Break

4:00 PM

(EMA-073-2022) Graphene probe for the electrical properties at oxide film and graphene interfaces (Invited)

H. KANG^{*1}
1. Pusan National University, Department of Physics, Republic of Korea

4:30 PM

(EMA-074-2022) "Atomic-level semiconductor" via flat phonon bands (Invited)

J. Lee^{*1}
1. Ulsan National Institute of Science & Technology, Republic of Korea

S7: Superconducting and Related Materials: From Basic Science to Applications

New Superconductors, Unconventional Superconductors and Related Materials I

Room: Orange B
Session Chair: Michael Susner, The Air Force Research Laboratory

10:00 AM

(EMA-028-2022) Study of various superconductors grown at the National Cheng Kung University in Taiwan (Invited)

N. Kuo¹;
C.C. Lue^{*1}
1. National Cheng Kung University, Department of Physics, Taiwan

Final Program

Wednesday, January 19, 2022

10:30 AM

(EMA-029-2022) Unconventional charge order and superconductivity in kagome materials (Invited)

J. Yin^{*1}

1. Princeton University, USA

11:00 AM

(EMA-030-2022) Superconductivity in Europium Bismuth Sulfofluorides (Invited)

H. ZHA^{*1}

1. Northwest University, physics, China

11:30 AM

(EMA-031-2022) Where Will the Next Class of High-Temperature Superconductor Be Found? (Invited)

D. Parker^{*1}

1. Oak Ridge National Lab, MSTD, USA

12:00 PM

(EMA-032-2022) Tomonaga-Luttinger liquid and superconductivity in quasi-one-dimensional $A_2Mo_3As_3$ metal (Invited)

D. Arcon^{*1}; Z. Gosar¹; B. Lv²

1. Institute Jozef Stefan, Condensed matter physics department, Slovenia

2. University of Texas, Dallas, USA

New Superconductors, Unconventional Superconductors and Related Materials II

Room: Orange B

Session Chair: Timothy Haugan, U.S. Air Force Research Laboratory

2:00 PM

(EMA-075-2022) Role of defects and magnetism on Ising superconductivity in monolayer NbSe₂ (Invited)

D. Wickramaratne^{*1}

1. Naval Research Laboratory, USA

2:30 PM

(EMA-076-2022) Pressure-induced high-temperature superconductivity retained at ambient pressure (Invited)

L. Deng^{*1}; T. Bontke¹; R. Dahal¹; Y. Xie³; B. Gao²; X. Li³; K. Yin⁴; M. Gooch¹; D. Rolston¹; T. Chen²; Z. Wu¹; Y. Ma³; P. Dai²; C. Chu¹

1. University of Houston, Physics, USA

2. Rice University, Physics and Astronomy, USA

3. Jilin University, Physics, China

4. Linyi University, Physics and Electronic Engineering, China

3:00 PM

(EMA-077-2022) New Verbeekite-type polymorphic phase, superconductivity, and rich phase diagram in the PdSe_{2-x}Te_x system (Invited)

w. liu^{*1}; R. Mehrdad¹; x. wang²; s. Li¹; H. Wu¹; P. Koirala²; M. Van de Pu¹; V. William Gerard Hubert²; B. Lv²

1. UNIVERSITY OF TEXAS AT DALLAS, Physics, USA

2. University of Texas, Dallas, USA

3. University of Houston, USA

3:30 PM

Break

4:00 PM

(EMA-078-2022) Enhanced superconductivity in tailor-made quasi-one-dimensional superconductors (Invited)

R. W. Lortz^{*1}

1. Hong Kong University of Science & Technology, Department of Physics, Hong Kong

4:30 PM

(EMA-079-2022) Superconductivity in one direction: the field-free Josephson diode (Invited)

H. Wu¹; M. Ali^{*1}

1. Delft University of Technology, Quantum Nanoscience, Netherlands

5:00 PM

(EMA-080-2022) Superconductivity in Moire Materials (Invited)

C. Lau^{*1}

1. The Ohio State University, Department of Physics, USA

S10: Point Defects and Transport in Ceramics

Point Defect Segregation to Dislocations, Surfaces, Grain Boundaries, and Interfaces

Room: Cypress B

Session Chair: Divine Kumah, North Carolina State University

10:00 AM - WITHDRAWN

(EMA-033-2022) Field-assisted sintering of Ta doped TiO₂

T. Kadosh^{*1}; C. Nicollet¹; J. Yang¹; B. Yildiz²; H. L. Tuller³

1. MIT, DMSE, USA

2. Massachusetts Institute of Technology, USA

3. Massachusetts Institute of Technology, Department of Materials Science and Engineering, USA

10:15 AM

(EMA-034-2022) Electrical Reliability of Lead Zirconate Titanate Piezoelectric Films (Invited)

S. Trolier-McKinstry^{*1}

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

10:45 AM

(EMA-035-2022) Investigating oxygen reduction pathways on pristine SOFC cathode surfaces by in-situ PLD impedance spectroscopy

M. Siebenhofer^{*1}; C. Riedl¹; A. Schmid¹; A. K. Opitz¹; J. Fleig¹; M. Kubicek¹

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

11:00 AM

(EMA-036-2022) Investigation of point defect segregation to planar faults in functional oxide thin films by scanning transmission electron microscopy (Invited)

A. Kumar¹; S. Ning¹; K. Klyukin¹; B. Yildiz²; C. Ross¹; J. LeBeau^{*1}

1. Massachusetts Institute of Technology, USA

Defect Mediated Properties

Room: Cypress B

Session Chair: Aaron Kohnert, Los Alamos National Lab

2:00 PM

(EMA-081-2022) Oxygen vacancy-induced anomalous Hall effect in KTaO₃ (Invited)

A. Al-Tawhid¹; j. kanter³; M. Hatipoglu³; D. Irving¹; D. P. Kumah²; j. shabani³; K. Ahadi^{*1}

1. NCSU, USA

2. North Carolina State University, Physics, USA

3. New York University, USA

2:30 PM

(EMA-082-2022) Intrinsic point defects in Sodium Niobate studied with hybrid density-functional theory.

L. Villa^{*1}; E. Ghorbani¹; K. Albe²

1. Technical University Darmstadt, Materialwissenschaft, Germany

2. Technical University Darmstadt, Fachgebiet Materialmodellierung, Germany

2:45 PM

(EMA-083-2022) Kinetic and atomistic origin of oxygen bubble formation in SOEC electrolytes

Y. Dong^{*1}; J. Li¹

1. Massachusetts Institute of Technology, USA

3:00 PM

(EMA-084-2022) Tailoring Defect-Induced Strain in Oxide Perovskites (Invited)

N. H. Perry^{*1}

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

Final Program

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3:30 PM
Break

4:00 PM
(EMA-085-2022) Electronic And Magnetic Coupling at Transition Metal Oxide Interfaces (Invited)

D. P. Kumah^{*1}; X. Zhang¹; A. Penn²
1. North Carolina State University, Physics, USA
2. North Carolina State University, Materials Science and Engineering, USA

4:30 PM
(EMA-086-2022) Influence of local charge and magnetic ordering on point defect properties in magnetite (Fe_3O_4)

S. Srivastava^{*1}; B. P. Uberuaga²; M. Asta¹
1. University of California Berkeley, Materials Science and Engineering, USA
2. Los Alamos National Laboratory, Materials Science and Technology Division, USA

4:45 PM
(EMA-087-2022) Structure and electrical conduction properties of grain boundaries and domain-walls in LiNbO_3 (Invited)

A. Nakamura^{*1}
1. Osaka University, Department of Mechanical Science and Bioengineering, Japan

S11: Evolution of Structure and Chemistry of Grain Boundaries and Their Networks as a Function of Material Processing

Interface Structure and Chemistry

Room: Magnolia B/C
Session Chair: Ed Gorzkowski, U.S. Naval Research Laboratory

10:00 AM
(EMA-037-2022) Impact of Aliovalent Alkaline-Earth Metal Solutes on Ceria Grain Boundaries (Invited)

A. Singh^{*1}
1. Arizona State University, Physics, USA

10:30 AM
(EMA-038-2022) Atomic Scale Defect Chemistry at Grain Boundaries using 4-D STEM and APT (Invited)

B. P. Gorman^{*1}
1. Colorado School of Mines, Metallurgical and Materials Engineering, USA

11:00 AM
(EMA-039-2022) Grain Boundary Segregation and Energy in Multiphase Oxide Ceramics Processed by Different Sintering Techniques (Invited)

W. Bowman^{*1}; K. Syed¹; M. Mecartney¹
1. University of California, Irvine, Materials Science and Engineering, USA

11:30 AM
(EMA-040-2022) Interaction of Ytterbium Pyrosilicate Environmental-Barrier-Coating Ceramics with Molten Calcia-Magnesia-Alumonosilicate Glass

H. Sternlicht^{*1}; N. P. Padture²
1. National Center for Electron Microscopy, Lawrence Berkeley National Laboratory, USA
2. Brown University, School of Engineering, USA

11:45 AM
(EMA-041-2022) Thermal, electrical, and microstructural characterizations of copper-tungsten (Cu/W) multilayers grown under compressive and tensile stresses

M. Hoque^{*1}; G. Lorenzin²; D. Ariosa²; J. Tomko¹; C. Cancellieri²; P. E. Hopkins³
1. University of Virginia, Mechanical and Aerospace Engineering, USA
2. Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland
3. University of Virginia, Departments of Mechanical and Aerospace Eng./Materials Science and Eng./Physics, USA

Microstructure Evolution

Room: Magnolia B/C
Session Chair: James Wollmershauser, U.S. Naval Research Laboratory

2:00 PM - WITHDRAWN

(EMA-088-2022) Fundamental Insights into Microstructure and Properties of Ceramics Densified with the Cold Sintering Process (Invited)

C. Randall^{*1}; S. H. Bang¹; A. Ndayishimiye¹; Z. Grady¹
1. Pennsylvania State University, Materials Science and Engineering, USA

2:30 PM

(EMA-090-2022) Conductive hotspots in $\text{Hf}_{0.5}\text{Zr}_{0.5}\text{O}_2$: an automated experiment investigation

Y. Liu^{*1}; S. Fields²; K. P. Kelley¹; S. Jesse¹; S. Trolier-McKinstry³; M. Ziatdinov¹; J. Ihlefeld²; S. Kalinin¹
1. Oak Ridge National Lab, USA
2. University of Virginia, Department of Materials Science and Engineering, USA
3. Pennsylvania State University, Materials Science and Engineering, USA

2:45 PM

(EMA-091-2022) Engineering Grain Boundary Anisotropy to Suppress Abnormal Grain Growth in Alumina

B. Conry^{*3}; M. Kole³; J. Harley¹; M. R. Tonks³; M. Kesler²; A. Krause³
1. University of Florida, Electrical and Computer Engineering, USA
2. Oak Ridge National Lab, USA
3. University of Florida, Materials Science and Engineering, USA

3:00 PM

Break

Processing Parameters

Room: Magnolia B/C
Session Chair: Amanda Krause, University of Florida

4:00 PM

(EMA-092-2022) Structure, Chemistry and Composition of Grain Boundary Complexions in Boron Suboxide (Invited)

K. D. Behler^{*1}; C. J. Marvel²; J. LaSalvia³; J. Synowczynski-Dunn¹; W. T. Shoulders¹; S. Walck³; H. Payne⁴; T. W. Moore³; M. P. Harmer²
1. U.S. Army Research Laboratory, DEVCOM, USA
2. Lehigh University, USA
3. SURVICE Engineering, USA
4. CQL at DEVCOM ARL, USA

4:30 PM

(EMA-093-2022) Effect of Reduced Atmosphere Sintering on Blocking Grain Boundaries in Rare-Earth Doped Ceria (Invited)

J. Nino^{*1}
1. University of Florida, USA

5:00 PM

(EMA-094-2022) Overcoming microstructural homogeneity in ceramic battery electrolytes sintered by flash and cold sintering

G. Jones¹; D. Dabera¹; P. Tabrizian¹; C. Green²; S. Ghanizadeh³; S. Fisher John³; S. Gorman²; G. West¹; D. Pearmain³; E. Kendrick²; C. E. Dancer^{*1}
1. University of Warwick, Warwick Manufacturing Group, United Kingdom
2. University of Birmingham, School of Metallurgy and Materials, United Kingdom
3. Lucideon Ltd., United Kingdom

5:15 PM - WITHDRAWN

(EMA-095-2022) Electroceramics with functional grain boundaries via cold sintering

J. M. Garcia^{*1}; S. Dursun¹; K. Tsuji¹; A. Ndayishimiye¹; S. H. Bang¹; Z. Fan¹; B. M. Foley¹; C. Randall¹
1. Pennsylvania State University, USA

5:30 PM

(EMA-096-2022) Processing and Properties of High Interfacial Structure Nanocomposite Ceramics

J. Wollmershauser^{*1}; K. Anderson²; B. Greenberg³; H. Ryoo¹; E. Gorzkowski¹; B. Feygelson³
1. U.S. Naval Research Laboratory, Materials Science & Technology Division, USA
2. National Research Council Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory, USA
3. Electronic Science & Technology Division, U.S. Naval Research Laboratory, USA

Poster Session

Room: Orange C/D

5:30 PM

(EMA-P001-2022) Machine Learning Approaches to Predict Properties from Microstructure Images in Ceramic-Metal Composites

H. B. Smith^{*}; W. Huddleston¹; L. Bruckman¹; A. Sehirlioglu²

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

(EMA-P002-2022) Fabrication and Characterization of an Additively Manufactured Thermoelectric Material

J. J. Potticary^{*}; B. Baker¹; H. Elbidweihy²; E. Retzlaff¹; P. Joyce¹

1. United States Naval Academy, Mechanical Engineering, USA
2. United States Naval Academy, Electrical Engineering, USA

(EMA-P003-2022) Exploring Hindrances in Entropy Stabilization

K. E. Johnson^{*}; G. Niculescu¹; E. Johnson²; L. J. Joyce¹; K. Letchworth-Weaver¹; C. M. Rost¹

1. James Madison University, Physics and Astronomy, USA
2. James Madison University, Department of Geology and Environmental Science, USA

(EMA-P005-2022) Relaxor Behavior and Effect of Bi-Dopants in Barium Zirconate Titanate Solid Solutions as Energy Storage Materials

E. Kroell^{*}; D. C. Lupascu¹; S. V. Vladimir¹

1. University of Duisburg-Essen, Institute for Materials Science, Germany

(EMA-P006-2022) Emergent evolution of oxide superlattices and heterostructures: Thermal, optical, and electronic characterization via ultrafast spectroscopic methods

S. Hoseini Makrem^{*}; J. Tomko¹; P. E. Hopkins¹

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

(EMA-P007-2022) Acid-Base Reactions of Layered Perovskite Materials for Mechanical Exfoliation of Nanosheets

B. Hirt^{*}; A. Sehirlioglu¹; M. Ornek²; C. Wernex²

1. Case Western Reserve University, Material Science and Engineering, USA
2. Purdue University, Mechanical Engineering, USA

(EMA-P008-2022) Preparation of new high-entropy perovskite-type oxides

G. Wang^{*}; D. C. Sinclair¹; C. L. Freeman¹; A. Nasrallah¹

1. University of Sheffield, Materials Science & Engineering, United Kingdom

(EMA-P009-2022) Electrical Characterization of Lithium Cobalt Oxide Nanosheets

B. Powers Beggs^{*}; K. Pachuta²; R. Vasudevan¹; A. Sehirlioglu²

1. Oak Ridge National Lab, USA
2. Case Western Reserve University, USA

(EMA-P010-2022) Rietveld Refinement of Neutron Diffraction Data of Li_xCoO_2

J. Frostad^{*}; K. Pachuta¹; A. Sehirlioglu¹

1. Case Western Reserve University, USA

(EMA-P011-2022) Strain engineering and high resolution XRD of $\text{K}_{1-x}\text{Na}_x\text{NbO}_3$ thin films synthesized through aqueous solution deposition

M. Mahmoudvand^{*}; S. R. Burns¹; A. Z. Mohammed²; M. Dolgos¹

1. University of Calgary, Canada
2. University of Calgary, Chemistry, Canada

(EMA-P012-2022) Strain-induced 1D ferroelectricity in niobium oxide trihalides

S. Kim^{*}; J. Byun²; J. Lee²

1. Pusan National University, physics, Republic of Korea
2. Pusan National University, Department of Physics, Republic of Korea

(EMA-P013-2022) Synthesis and Characterization of a Novel Piezoelectric Material with a Morphotropic Phase Diagram

M. Dolgos^{*}

1. University of Calgary, Canada

(EMA-P014-2022) Processing Structure Property Relationships in Hafnia-based Nanoparticles

E. Anguish^{*}; M. Miller¹; J. Andrew²

1. University of Florida, Materials Science and Engineering, USA
2. University of Florida, USA

(EMA-P015-2022) Growth of thin film lithium cobalt oxide for electrochemical studies

K. Gliebe^{*}; A. Sehirlioglu²

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

(EMA-P016-2022) Sign reversal of tunneling magnetoresistance in all-oxide-based synthetic antiferromagnets

Z. Zhang^{*}

1. University of Science and Technology of China, Hefei National Laboratory for Physical Sciences at the Microscale, China

(EMA-P017-2022) Thermal Processing of Ceramic Thin Films via Pulsed Laser Annealing

N. A. Graham^{*}; R. J. Warzoha¹; E. Patterson²; E. Gorzkowski²; B. F. Donovan¹

1. United States Naval Academy, USA
2. Naval Research Lab, USA

(EMA-P018-2022) Toward Video Rate Visualization of Ferroelectric Domains by Friction Asymmetry

S. Cho^{*}; I. Gaponenko²; K. C. Edwards²; E. Cho¹; L. Musy¹; J. Yeom¹; C. Lichtensteiger²; P. Paruch²; S. Hong¹

1. Korea Advanced Institute of Science and Engineering (KAIST), Materials Science and Engineering, Republic of Korea
2. University of Geneva, DQMP, Switzerland

(EMA-P019-2022) WITHDRAWN - Structural design for high performances and high durability of copper oxide photoelectrodes

D. Kim¹; H. Cho^{*}

1. Sungkyunkwan University, Republic of Korea

(EMA-P020-2022) First-principle Study of Interplay Between Flat and Dirac Band

M. Kang^{*}; Y. Jin¹; J. Lee¹

1. Pusan National University, Department of Physics, Republic of Korea

(EMA-P021-2022) Conductivity trends & mechanisms in heavily acceptor doped $\text{Pb}(\text{Zr},\text{Ti})\text{O}_3$

V. Sangwan^{*}; M. Bowen²; D. Cann²

1. Oregon State University, Mechanical, Industrial and Manufacturing Engineering, USA
2. Oregon State Univ, School of Mechanical, Industrial, and Manufacturing Engineering, USA

(EMA-P022-2022) Exploring point defects and trap states in undoped SrTiO_3 single crystals

M. Siebenhofer^{*}; F. Baitutti²; M. Liedke³; J. Fleig¹; M. Kubicek¹

1. TU Wien, Institute of Chemical Technologies and Analytics, Austria
2. IREC, Nanoionics and Fuel Cells, Spain
3. Helmholtz-Zentrum Dresden-Rossendorf, Nuclear Physics, Germany

(EMA-P023-2022) Surface decoration of $\text{Pr}_{0.1}\text{Ce}_{0.9}\text{O}_{2.8}$ electrodes with binary oxides measured by in-situ PLD technique

C. Riedl^{*}; M. Siebenhofer¹; A. Limbeck¹; A. K. Opitz¹; M. Kubicek¹; J. Fleig¹

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

(EMA-P024-2022) First-principles investigation on the physical origin of the electro-plasticity of metals

S. Yoo^{*}

1. Kyung Hee University, Physics, Republic of Korea

(EMA-P025-2022) A novel method to calculate size-dependent conductivity of metal interconnects based on modified relaxation time

J. Lee^{*}; Y. Lee¹; S. Lee¹; Y. Kwon¹

1. Kyung Hee University, Department of physics, Republic of Korea

(EMA-P026-2022) Ab initio Study on the Structural and Electronic Properties of Interfacial Phase-Change Memory

S. Park^{*}; C. Lee²; M. Cho²; Y. Kwon¹

1. Kyung Hee University, Department of Physics, Republic of Korea

2. Yonsei University, Department of Physics and Applied Physics, Republic of Korea

(EMA-P027-2022) Magnetic anisotropy energy of Fe layers controlled by various perovskite ABO₃ substrates

D. Jeong^{*1}; Y. Kwon¹
1. Kyung Hee University, Physics, USA

(EMA-P028-2022) Resistive switching in Au/Nb:STO junctions under different environments

S. Kunwar^{*1}
1. Los Alamos National Lab, USA

(EMA-P029-2022) Reversible polarization switching in leaky ferroelectrics using an ionic gel induced electrostatic field effect

S. Huang^{*1}; F. Blom¹; G. Koster¹; G. Rijnders¹
1. University of Twente, TNW, Netherlands

Thursday, January 20, 2022

Plenary Sessions

Plenary Session II

Room: Orange A
Session Chair: Amanda Krause, University of Florida

8:30 AM

Speaker Introduction

8:40 AM

(EMA-PLEN-002-2022) Energy-Efficient Hardware and Intelligent Materials for Brain-inspired Computing: Artificial Synapses Based on Proton and Oxygen Motion

B. Yildiz^{*1}
1. Massachusetts Institute of Technology, USA

9:30 AM

Break

S2: Advanced Electronic Materials: Processing Structures, Properties, and Applications

Advanced Electronic Materials, including Ferroelectric, Piezoelectric, Dielectric, Electrostrictive, and Pyroelectric Materials III

Room: Citrus A
Session Chair: Eric Patterson, U.S. Naval Research Laboratory

10:00 AM

(EMA-097-2022) Solid-state crystal growth of (K,Na)NbO₃ and (K,Na)NbO₃-based single crystals (Invited)

I. Fujii^{*1}; S. Ueno¹; S. Wada¹
1. University of Yamanashi, Japan

10:30 AM

(EMA-098-2022) Electromechanical Coupling in AlN and Sc_xAl_{1-x}N Films Grown by Plasma-Assisted Epitaxy on Various Metallic Seed Layers and Substrates

M. Greenslatt^{*1}; M. Cunha²; R. J. Lad¹
1. University of Maine, Physics and Astronomy, USA
2. University of Maine, Electrical & Computer Engineering, USA

10:45 AM - WITHDRAWN

(EMA-099-2022) Dielectric permittivity study of AgNbO₃ antiferroelectric multilayers for use at high electric fields and temperatures

L. Fulanovic^{*2}; M. Zhang²; N. Novak³; J. Koruza¹; J. Rödel²
1. Graz University of Technology, Institute for Chemistry and Technology of Materials, Austria
2. Technische Universität Darmstadt, Germany
3. Jozef Stefan Institute, Department of Condensed Matter Physics, Slovenia

*Denotes Presenter

11:00 AM - WITHDRAWN

(EMA-100-2022) - Lead-free and antiferroelectric ceramics for novel energy and heat-management technologies

Z. Kutnjak^{*1}; B. Rozic²; Z. Hanani⁶; S. Merselmiz⁶; D. Mezzane⁶; M. El Marssi³; H. Ursić⁴; M. Spreitzer⁵

1. Jozef Stefan Institute, Slovenia
2. Jozef Stefan Institute, Department of Condensed Matter Physics, Slovenia
3. Université de Picardie Jules Verne, LPMC, France
4. Jozef Stefan Institute, Electronic Ceramics Department, Slovenia
5. Jozef Stefan Institute, Advanced Materials, Slovenia
6. Cadi Ayyad University, IMED-lab, Morocco

11:15 AM

(EMA-101-2022) Direct observation on the ferroelectric-antiferroelectric transition in Pb(Nb,Zr,Sn,Ti)O₃/ZnO ceramic composites

B. Liu^{*1}
1. Iowa State University, Materials Science and Engineering, USA

11:30 AM - WITHDRAWN

(EMA-102-2022) Stability of piezoceramic materials at high power drive (Invited)

J. Koruza^{*1}; M. Slabki²
1. TU Graz, Austria
2. TU Darmstadt, Materials and Earth Sciences, Germany

12:00 PM

(EMA-103-2022) Aerosol Deposition and Characterization of Sodium Niobate

E. Patterson^{*1}; J. Wollmershauser²; E. Gorzkowski¹
1. Naval Research Laboratory, USA
2. U.S. Naval Research Laboratory, Materials Science & Technology Division, USA

12:15 PM

(EMA-104-2022) pO₂-Mediated Transport as a Means for Structural and Electronic Tunability in Entropy Stabilized Oxides

V. Jacobson^{*1}; D. Diercks¹; B. To²; K. Gann¹; A. Zakutayev²; G. L. Brennecke³
1. Colorado School of Mines, USA
2. National Renewable Energy Lab, USA
3. Colorado School of Mines, USA

Materials Design, New Materials and Structures, and their Emerging Applications / Reliability and Fatigue of Ferroelectrics and Related Devices

Room: Citrus A

Session Chair: Eric Patterson, U.S. Naval Research Laboratory

2:00 PM

(EMA-141-2022) Thermodynamic Phase Equilibria in the Nb₂O₅ — TiO₂ Binary System and Associated Ferroelectric Applications

R. Spurling^{*1}; J. Hayden¹; J. Maria¹
1. Pennsylvania State University, Materials Science and Engineering, USA

2:15 PM

(EMA-143-2022) Synthesis of α -MoO₃ Crystals via Chemical Vapor Transport for Directional and Hypersonic Heat Flow

R. Spangler^{*1}; J. Caldwell²; A. Cleri¹; K. Diaz-Granados²; P. E. Hopkins³; J. Tomko³; D. Hirt³; J. Maria¹
1. Pennsylvania State University, Materials Science and Engineering, USA
2. Vanderbilt University, USA
3. University of Virginia, Materials Science and Engineering, USA

2:30 PM

(EMA-144-2022) Modulation of the Bi³⁺ 6s² lone pair state in perovskites for high-mobility p-type oxide semiconductors

J. Shi^{*1}; H. Zhang²
1. Xiamen University, Department of Chemistry, China
2. Xiamen University, College of Chemistry and Chemical Engineering, China

2:45 PM - WITHDRAWN

(EMA-145-2022) Research on Electro-Thermodynamic Cycle Power Generation with multifaceted analysis

- H. Tanaka^{*}; T. Nagatani¹; S. Yamaguchi¹; T. Ichikawa¹; H. Hashimoto²; T. Sekino³; T. Kawasaki³; M. Baba⁴; M. Takeda⁴; T. Nakayama⁴
1. Kwansei Gakuin University, Nanotechnology for Sustainable Energy, Japan
 2. Sanjo City University, Faculty of Engineering, Japan
 3. Osaka University, The Institute of Scientific and Industrial Research, Japan
 4. Nagaoka University of Technology, Japan
 5. Japan Atomic Energy Agency, Sector of Nuclear Science Research, Japan

3:00 PM

(EMA-146-2022) Photocatalytic activity of magnetically separable N-doped rGO/NiFe₂O₄@Ti-doped ZnO ternary nanocomposite

- A. Malek Khachatourian¹; Z. Abdi¹; A. Nemati^{*}
1. Sharif University of Technology, Tehran, Iran, Materials Science & Eng., Islamic Republic of Iran

3:15 PM - WITHDRAWN

(EMA-147-2022) Development on doped-BaTiO₃ System Ferroelectrics for Electro-thermodynamic Cycle Power Generation

- T. Nagatani^{*}; S. Yamaguchi³; T. Ichikawa³; H. Hashimoto⁵; T. Sekino¹; T. Kawasaki⁴; M. Baba²; M. Takeda²; T. Nakayama²; H. Tanaka³
1. Osaka University, The Institute of Scientific and Industrial Research, Japan
 2. Nagaoka University of Technology, Japan
 3. Kwansei Gakuin University, Nanotechnology for Sustainable Energy, Japan
 4. Japan Atomic Energy Agency, Sector of Nuclear Science Research, Japan
 5. Sanjo City University, Faculty of Engineering, Japan

3:30 PM

Break

4:00 PM - WITHDRAWN

(EMA-148-2022) Colossal electrical conductivity anisotropy in graphene / aluminum nitride ceramics

- D. Kenfau²; S. Guillemet-Fritsch^{*1}; P. Dufour²; C. Tenailleau¹; M. Locatelli²; V. Bley²; L. Laudebat²; Z. Valdez-Nava²
1. CNRS CIRIMAT, Material Science, France
 2. University de Toulouse, LAPLACE, France

4:15 PM

(EMA-149-2022) DC lifetime and thermally stimulated depolarization current (TSDC) of Bi(Zn,Ti)O₃-BaTiO₃ (BZT-BT)

- S. Bishop^{*}; M. Blea-Kirby¹; A. Peretti¹; L. Jauregui¹; W. Bachman¹; J. A. Bock¹
1. Sandia National Laboratories, Electronic, Optical, and Nano Materials, USA

4:30 PM - WITHDRAWN

(EMA-150-2022) Mechanical characterization of thin brittle substrates for microelectronic applications

- M. Gruber^{*}; P. Supancic¹; I. Kravleva¹; R. Bermejo¹
1. University of Leoben, Institute of Structural and Functional Ceramics, Austria

4:45 PM

(EMA-151-2022) Investigation of mechanical and electrical properties of lead-free piezoelectric 0-3 composites

- A. Martin^{*}; K. Kakimoto²
1. Nagoya Institute of Technology, Japan
 2. Nagoya Institute of Technology, Graduate School of Eng., Dept. Mater. Sci. & Eng., Japan
- 5:00 PM**
- (EMA-152-2022) Examination of Electrical Properties of Foam Insulators.**
- I. Gunes^{*}
1. Istanbul University Cerrahpasa, Engineering Faculty, Electrical Engineering Department, Turkey

S3: Frontiers in Ferroic Oxides: Synthesis, Structure, Properties, and Applications

Magnetic, Ferroelectric, and Multiferroic Films and Ceramics

Room: Magnolia A

Session Chair: John Heron, University of Michigan

10:00 AM

(EMA-105-2022) Improper ferroelectricity in ultrathin films (Invited)

- J. Nordlander^{*}
1. Harvard University, Department of Physics, USA

10:30 AM

(EMA-106-2022) Controlling charged domain walls with electric fields in h-YMnO₃ thin films

- A. Bortis^{*}; M. Trassin¹; M. Fiebig¹; T. Lottermoser¹
1. ETH Zurich, Department of Materials, Switzerland

10:45 AM

(EMA-107-2022) Influence of Varied Sapphire Substrate Topographies on the Multiferroic Properties of Aurivillius Phase Thin Films

- L. Colfer^{*}; N. Bagués¹; M. Bansal³; M. Schmidt⁴; B. Long⁵; T. Maity³; D. W. McComb¹; L. Keeney²
1. The Ohio State University, Center for Electron Microscopy and Analysis, USA
 2. Tyndall National Institute, University College Cork, Advanced Materials and Surfaces Group, Ireland
 3. Indian Institute of Science Education and Research Thiruvananthapuram, India
 4. Tyndall National Institute, Ireland
 5. University College Cork, School of Chemistry, Ireland

11:00 AM

(EMA-108-2022) Layer-by-layer symmetry probing of Aurivillius Bi₅FeTi₃O₁₅ thin films by in-situ second harmonic generation

- I. Efe^{*}; E. Gradauskaitė¹; M. Fiebig¹; M. Trassin¹
1. ETH Zurich, Department of Materials, Switzerland

11:15 AM

(EMA-109-2022) Probing the Dynamics of Charged Multiferroic Topologies at the Atomic Scale (Invited)

- M. Conroy^{*}; E. O'Connell²; S. Griffin³; L. Jones³; R. Whatmore¹; K. Moore³; C. Downing⁴; U. Bangert³; C. Ophus⁵
1. Imperial College London, Materials, United Kingdom
 2. Max Planck Institute for the Science of Light & Max-Planck-Zentrum für Physik und Medizin, Erlangen, Germany
 3. University of Limerick, Physics, Ireland
 4. Trinity College Dublin, Ireland
 5. Molecular Foundry, Lawrence Berkeley National Laboratory, USA

11:45 AM

(EMA-110-2022) Non-invasive probing of complex order in ferroelectric/dielectric superlattices

- N. Strkalj^{*}; A. Bortis¹; M. Bernet²; J. Bang²; M. F. Sarott²; M. Campanini³; M. Rossell³; T. Weber²; M. Trassin²; M. Fiebig²
1. University of Cambridge, United Kingdom
 2. ETH Zurich, Department of Materials, Switzerland
 3. EMPA, Switzerland

12:00 PM

(EMA-111-2022) Deterministic control of ferroelectric polarization by ultrafast laser pulses (Invited)

- P. Chen^{*}; C. Paillard²; H. Zhao⁴; J. Iñiguez²; L. Bellaiche¹
1. University of Arkansas, Physics, USA
 2. Université Paris-Saclay, Laboratoire Structures, Propriétés et Modélisation des Solides, CentraleSupélec, France
 3. Luxembourg Institute of Science and Technology (LIST), Materials Research and Technology, Luxembourg
 4. Jilin University, International Center for Computational Method and Software (ICCMS), China

Ferroelectric Alloys and Ferroelectric Domains I

Room:MagnoliaA

Session Chair: Martin Sarott, ETH Zurich

2:00 PM

(EMA-153-2022) Wake-up, Retention, and Fatigue in AlN-based Ferroelectrics (Invited)

W. Zhu¹; J. Hayden²; F. He¹; J. Yang¹; J. Maria¹; S. Trolier-McKinstry^{*}

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

2:30 PM

(EMA-154-2022) Robust Ferroelectricity in Wurtzite (Zn,Mg)O Thin Films

G. Ryu^{*3}; L. Jacques²; S. Shetty¹; S. Trolier-McKinstry³; J. Maria³

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

2:45 PM

(EMA-155-2022) Impact of Oxygen Content on Crystallization and Ferroelectric Behavior of Hafnium Oxide Thin Films

S. T. Jaszewski^{*1}; E. Hogland¹; A. Costine¹; M. Weber²; S. Fields²; M. T. Sales¹; J. Vaidya⁴; L. Bellcase⁵; K. Loughlin⁶; A. Salanova²; M. D. Henry⁷; J. Maria¹; J. L. Jones⁶; N. Shukla⁸; S. McDonnell¹; P. Reinke¹; J. Ihlefeld²

1. University of Virginia, Materials Science and Engineering, USA
2. University of Virginia, Department of Materials Science and Engineering, USA
3. Washington State University, USA
4. University of Virginia, Electrical and Computer Engineering, USA
5. Sandia National Laboratories, USA
6. North Carolina State University, Dept. of Materials Science & Engineering, USA
7. Pennsylvania State University, Materials Science and Engineering, USA

3:00 PM

(EMA-156-2022) Rhombohedral Hf_{0.5}Zr_{0.5}O₂ thin films: Ferroelectricity and devices (Invited)

Y. Wei^{*1}; P. Nukala²; B. Noheida³

1. École polytechnique fédérale de Lausanne (EPFL), Switzerland
2. Indian Institute of Science, India
3. University of Groningen, Netherlands

3:30 PM

Break

Ferroelectric Alloys and Ferroelectric Domains II

Room:MagnoliaA

Session Chair: John Heron, University of Michigan

4:00 PM

(EMA-157-2022) Preparation of Ta-Substituted ZrO₂ Films for Ferroelectric Memory Devices

T. MIMURA^{*1}; L. Askew¹; J. Ihlefeld¹

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

4:15 PM

(EMA-158-2022) Multilevel polarization switching in ferroelectric thin films

M. F. Sarotti^{*}; M. Rossell²; M. Fiebig¹; M. Trassin¹

1. ETH Zürich, Department of Materials, Switzerland
2. Empa, Swiss Federal Laboratories for Materials Science and Technology, Electron Microscopy Center, Switzerland

4:30 PM

(EMA-159-2022) Electrostatic effects in nanoscale ferroelectrics (Invited)

C. Gattinoni^{*1}; I. Efe²; N. Spaldin²

1. London South Bank University, Chemical and Energy Engineering, United Kingdom
2. ETH Zurich, Department of Materials, Switzerland

5:00 PM

(EMA-160-2022) Natural limits to minimum domain size in barium titanate using multi-scale modeling

A. J. Klomp^{*}; R. Khachaturyan²; T. Wallis²; A. Grünebohm²; K. Albe³

1. TU Darmstadt, Materials Science, Germany
2. Ruhr-Universität Bochum, ICAMS, Germany
3. Technical University Darmstadt, Fachgebiet Materialmodellierung, Germany

5:15 PM

(EMA-161-2022) Tunable microwave conductance of nanodomains in ferroelectric PbZr_{0.2}Ti_{0.8}O₃ thin film

S. R. Burns^{*1}; A. Tselev²; A. levlev³; J. Agar⁴; L. W. Martin⁵; S. Kalinin³; D. Sando⁶; P. Maksymovych³

1. University of Calgary, Canada
2. University of Aveiro, Portugal
3. Oak Ridge National Lab, USA
4. Lehigh University, USA
5. University of California, Berkeley, Materials Science and Engineering, USA
6. University of New South Wales, Australia

5:30 PM

(EMA-162-2022) Oxygen vacancy injection as a pathway to enhancing electromechanical response in ferroelectrics

K. Kelley^{*1}; M. Morozovska²; E. Eliseev²; V. Sharma³; D. E. Yilmaz⁴; A. C. van Duin⁴; P. Ganesh¹; A. Borisevich¹; S. Jesse¹; P. Maksymovych¹; N. Balke¹; S. Kalinin¹; R. Vasudevan¹

1. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA
2. National Academy of Science Ukraine, Ukraine
3. Oak Ridge National Lab, USA
4. Pennsylvania State University, USA

S4: Complex Oxide Thin Films and Heterostructures: From Synthesis to Strain/Interface-engineered Emergent Properties

Controlled Synthesis of Lateral and Vertical Heteroepitaxial Thin Films and Nanocomposites II

Room: Orange A

Session Chair: Hyoungjeen Jeen, Pusan National University

10:00 AM

(EMA-112-2022) Stabilizing Otherwise Unstable Complex Oxides through Tailored Superlattices (Invited)

L. Wang^{*}

1. Pacific Northwest National Laboratory, USA

10:30 AM

(EMA-113-2022) Synthesis of an immiscible epitaxial oxide heterostructure with tunable wavelength-selectivity

M. Webb^{*1}; S. McSherry²; J. Kaufman³; Z. Deng¹; T. Ma⁴; E. Kioupakis¹; K. Esfarjani³; A. Lenert²; J. Heron¹

1. University of Michigan, Materials Science and Engineering, USA
2. University of Michigan, Chemical Engineering, USA
3. University of Virginia, USA
4. University of Michigan, Michigan Center for Materials Characterization, USA

10:45 AM

(EMA-114-2022) Exsolution synthesis of tunable multifunctional thin-film nanocomposite

J. Wang^{*1}; K. Syed²; S. Ning¹; I. Waluyo³; A. Hunt³; E. Crumlin⁴; A. K. Opitz⁵; C. Ross¹; W. Bowman²; B. Yildiz²

1. Massachusetts Institute of Technology, USA
2. University of California, Irvine, Department of Materials Science & Engineering, USA
3. Brookhaven National Laboratory, USA
4. Advanced Light Source, USA
5. TU Wien, Institute of Chemical Technologies and Analytics, Austria

11:00 AM

(EMA-115-2022) Ordered Hybrid Metamaterial of La_{0.7}Sr_{0.3}MnO₃-Au Vertically Aligned Nanocomposites Achieved on Templated SrTiO₃ Substrate

J. Lu^{*}; R. Paldi¹; Y. Pachaury¹; D. Zhang¹; H. Wang¹; M. Kalaswad¹; X. Sun¹; J. Liu¹; X. Phuah¹; X. Zhang¹; A. El-Azab¹; H. Wang¹

1. Purdue University, School of Materials Engineering, USA

Final Program

Thursday, January 20, 2022

11:15 AM

(EMA-116-2022) Oxygen Transfer in Oxide Heterostructures

K. Kang²; A. Chen^{*1}

1. Los Alamos National Lab, USA

2. Kyungpook National University, Republic of Korea

Strain- and Interface-controlled Device Performance

Room: Orange A

Session Chair: Ambrose Seo, University of Kentucky

2:00 PM

(EMA-163-2022) Engineering iridate superlattices for capturing and controlling antiferromagnetic fluctuations (Invited)

J. Liu^{*1}

1. University of Tennessee, USA

2:30 PM

(EMA-164-2022) Perpendicular Magnetic Anisotropy and Magnetotransport Anomaly in Ultrathin Ferrimagnetic Spinel NiCo_2O_4 (Invited)

X. Hong^{*1}

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

2:45 PM

(EMA-165-2022) Solid-State Electrochemical Control of Physical Properties for Transition Metal Oxide Epitaxial Films with Perovskite-Related Crystal Structures (Invited)

H. Ohta^{*1}; Q. Yang²; H. Jeen³

1. Hokkaido University, Research Institute for Electronic Science, Japan

2. Hokkaido University, Graduate School of Information Science and Technology, Japan

3. Pusan National University, Department of Physics, Republic of Korea

3:00 PM

(EMA-166-2022) Strain-Controlled Atomic Scale Distortions and Anti-Ferromagnetism at $\text{LaFeO}_3/\text{SrTiO}_3$ Interface

M. Zhu^{*1}; J. Flores²; J. Lanier²; S. Polat Genlik¹; M. Ghazisaeidi¹; F. Yang²; J. Hwang¹

1. Ohio State University, Material Science and Engineering, USA

2. Ohio State University, Department of Physics, USA

3:15 PM

(EMA-167-2022) Phase and structural investigation of Sr_xNbO_3 thin films grown via pulsed laser deposition

S. S. Almishal^{*1}; G. N. Kotsonis¹; J. Maria¹

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

3:30 PM

Break

Synthesis and Properties of High Entropy Complex Oxides

Room: Orange A

Session Chair: Aiping Chen, Los Alamos National Laboratory

4:00 PM

(EMA-168-2022) Complex Oxide Heterostructures with Controlled One-Dimensionality (Invited)

A. Seo^{*1}

1. University of Kentucky, Physics and Astronomy, USA

4:30 PM

(EMA-169-2022) Thermal and mechanical properties of the entropy stabilized oxide $(\text{MgCoNiCuZn})_{0.2}\text{O}$ across the critical temperature

C. M. Rost^{*2}; D. Schmuckler²; C. Bumgardner¹; M. Hoque¹; D. Diercks¹; G. N. Kotsonis³; J. Maria³; G. L. Brennecke⁶; X. Li⁵; P. E. Hopkins¹

1. University of Virginia, Mechanical & Aerospace Engineering, USA

2. James Madison University, Physics and Astronomy, USA

3. Pennsylvania State University, Materials Science and Engineering, USA

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

5. University of Virginia, USA

6. Colorado School of Mines, USA

4:45 PM

(EMA-170-2022) Impact of Synthesis Conditions on the Local Structure of Entropy Stabilized Oxides

T. Valentine^{*1}; C. M. Rost¹; M. Webb²; P. Meisenheimer²; J. Heron²; C. M. Rost¹

1. James Madison University, USA

2. University of Michigan, USA

5:00 PM

(EMA-171-2022) $\text{Y}_{0.2}\text{La}_{0.2}\text{Ce}_{0.2}\text{Pr}_{0.2}\text{Sm}_{0.2}\text{O}_{2-\delta}$ Epitaxial Growth and Optical Properties

G. N. Kotsonis^{*1}; J. Maria¹

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

5:15 PM

(EMA-172-2022) Configurational Disorder in High Entropy T' Phase Ruddlesden-Popper Perovskites

D. J. Rossi^{*1}; A. R. Mazza²; X. Gao²; B. Musico³; T. Valentine⁴; Z. Kennedy¹; T. Z. Ward⁵; C. M. Rost¹

1. James Madison University, Physics and Astronomy, USA

2. Oak Ridge National Lab, Materials Science and Technology, USA

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

4. James Madison University, USA

5. Oak Ridge National Lab, USA

S6: Emerging Semiconductors Materials and Interfaces

Control and Characterization over Defects and Dopant

Room: Citrus B

Session Chairs: Jaekwang Lee,, Pusan National University

10:00 AM

(EMA-117-2022) First-principles studies of the energetic and electronic properties of charged defects, dopants, and complexes in 2D materials (Invited)

R. G. Henning^{*1}

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

10:30 AM

(EMA-118-2022) Impact of Dopants and Film Thickness on the Thermal Conductivity of Indium Phosphide

C. Perez^{*1}; D. Taljera²; Z. Lui²; J. Ryu²; D. Botz²; V. Gopalan³; L. Mawst²; B. M. Foley¹

1. Pennsylvania State University, Mechanical engineering, USA

2. University of Wisconsin Madison, USA

3. Pennsylvania State University, USA

10:45 AM

(EMA-119-2022) Grain and Grain Boundary photoconduction in Perovskite Solar Cells with Tomographic AFM

L. Ortiz^{*1}; J. SONG¹; Y. Zhou²; B. Huey¹

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

2. Hong Kong Baptist University, Department of Physics, Hong Kong

11:00 AM

(EMA-120-2022) Revealing the Origin of Charge Modulation of 2DEG at $\text{LaAlO}_3/\text{SrTiO}_3$ Interface by In-situ TEM Biasing (Invited)

S. Oh^{*1}

1. Sungkyunkwan University, Energy Science, Republic of Korea

11:30 AM

(EMA-121-2022) Atomistic study of site-selective doping behavior in SnO_2

Y. Jin^{*1}; W. Jang²; Y. Kim²; J. Lee¹

1. Pusan National University, Department of Physics, Republic of Korea

2. SungKyunKwan University, Department of Energy science, Republic of Korea

Wide Bandgap and Ultra-wide Bandgap Semiconductor Thin Films and Heterojunctions

Room: Citrus B

Session Chairs: Sriram Krishnamoorthy, University of California, Santa Barbara

2:00 PM

(EMA-173-2022) Theoretical characterization and computational discovery of ultra-wide-band-gap semiconductors (Invited)

E. Kioupakis^{*1}

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

2:30 PM

(EMA-174-2022) Radiation Damage Effects in Ga_2O_3 Materials and Devices

F. Ren²; J. Kim³; A. Y. Polyakov⁴; S. Modak⁵; L. Chernyak⁵; A. Haque⁶; S. Pearton^{*1}

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

2. University of Florida, Chemical Engineering, USA

3. Korea University, Chemical Engineering, Republic of Korea

4. National University of Science and Technology MISIS, Russian Federation

5. University of Central Florida, Physics, USA

6. Pennsylvania State University, Mechanical Engineering, USA

2:45 PM

(EMA-175-2022) Nitrogen Ion-Implanted Resistive Regions for Edge Termination of Vertical Ga_2O_3 Rectifiers

X. Xia^{*1}; M. Xian¹; C. Fares¹; R. Sharma²; M. Law²; F. Ren¹; S. Pearton²

1. University of Florida, Chemical Engineering, USA

2. University of Florida, Materials Science and Engineering, USA

3:00 PM

(EMA-176-2022) Approaches Towards Oxide-Nitride Heterojunctions (Invited)

V. Wheeler^{*1}; D. R. Boris¹

1. Naval Research Laboratory, USA

3:30 PM

Break

4:00 PM

(EMA-177-2022) Shining the Spotlight on Defects in $\beta\text{-Ga}_2\text{O}_3$ (Invited)

M. Scarpulla^{*1}

1. University of Utah, USA

4:30 PM

(EMA-178-2022) Atomic-scale Characterization of Non-uniform $\gamma\text{-Ga}_2\text{O}_3$ Phases in Sn ion-implanted $\beta\text{-Ga}_2\text{O}_3$ Films

T. J. Yoo^{*1}; X. Xia²; F. Ren²; M. Tadjer³; S. Pearton¹; H. Kim¹

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

2. University of Florida, Chemical Engineering, USA

3. U.S. Naval Research Laboratory, USA

4:45 PM

(EMA-179-2022) Growth and Interface Characterization of In-situ MOCVD-grown Al_2O_3 Dielectric/(010) $\beta\text{-Ga}_2\text{O}_3$ Interface

S. Roy^{*1}; A. Chmielewski²; A. Bhattacharyya³; P. Ranga³; R. Sun³; M. Scarpulla³; N. Alem²; S. Krishnamoorthy¹

1. University of California, Santa Barbara, Materials, USA

2. Pennsylvania State University, Department of Material Science and Engineering, USA

3. University of Utah, Department of Electrical and Computer Engineering, USA

5:00 PM

(EMA-180-2022) Self-assembled superlattice structures on nominal InGaN films grown by plasma-assisted molecular beam epitaxy (Invited)

E. Ahmadi^{*1}

1. University of Michigan, USA

5:30 PM

(EMA-181-2022) Identification of Point Defects and Alloy Distribution in $\beta\text{-}(\text{Al}_{x}\text{Ga}_{1-x})_2\text{O}_3$ Heteroepitaxy

H. Huang^{*1}; J. M. Johnson¹; C. Chae¹; M. Wang²; S. Mu²; A. Bhuiyan²; Z. Feng²; N. K. Kalarickal²; S. Rajan²; H. Zhao²; C. Van de Walle³; J. Hwang¹

1. Ohio State University, MATERIALS SCIENCE AND ENGINEERING, USA

2. Ohio State University, Electrical and Computer Engineering, USA

3. University of California, Santa Barbara, Materials Department, USA

S7: Superconducting and Related Materials: From Basic Science to Applications

2D Materials and Low Dimensional Conductors I

Room: Orange B

Session Chair: Bing Lv, University of Texas-Dallas

10:00 AM

(EMA-122-2022) Efficient Control of 2D Magnetism (Invited)

C. Gong^{*1}

1. University of Maryland, USA

10:30 AM

(EMA-123-2022) Synthesis, formation mechanism and electronic properties of one-dimensional van der Waals heterostructures (Invited)

R. Xiang^{*1}; S. Maruyama¹

1. The University of Tokyo, Japan

11:00 AM

(EMA-124-2022) Emergent transport properties in superconducting tungsten disulfide nanotubes (Invited)

T. Ideue^{*1}

1. The University of Tokyo, Japan

11:30 AM

(EMA-125-2022) Magnetism and Superconductivity in 2D Layered metal Thiophosphates (Invited)

M. A. Susner^{*1}; B. S. Conner¹; B. Lv²; R. Rao¹

1. The Air Force Research Laboratory, USA

2. University of Texas, Dallas, USA

12:00 PM

(EMA-126-2022) Superconducting nanowire yarn consisting of NbN on dry-spun carbon nanotube sheets followed by the twist insertion (Invited)

D. Suh^{*1}

1. SungKyunKwan University, Department of Energy Science, Republic of Korea

2D Materials and Low Dimensional Conductors II

Room: Orange B

Session Chair: John Bulmer, Air Force Research Lab (AFRL)

2:00 PM

(EMA-182-2022) Electronic transport in ultrahigh-conductivity aligned carbon nanotube assemblies (Invited)

N. Komatsu^{*1}

1. Rice University, Electrical and Computer Engineering, USA

2:30 PM

(EMA-183-2022) Magnetoresistance of chemical vapour deposition spun carbon nanotube fibers (Invited)

A. Lekawa-Raus^{*1}

1. Warsaw University of Technology, Poland

3:00 PM - WITHDRAWN

(EMA-184-2022) Semiconducting Single-Walled Carbon Nanotube Yarns Fabricated via Wet-Spinning (Invited)

W. Yu^{*1}; Y. Kim¹; H. Yang¹; Y. Kim¹; J. Lee¹

1. Seoul National University, Material Science and Engineering, Republic of Korea

3:30 PM

Break

4:00 PM

(EMA-185-2022) Electrical and mechanical properties of high electrical conductivity CNT/Cu-yarns with Br doping and various encapsulations (Invited)

M. D. Sumption^{*1}; S. xue¹

1. Ohio State University, MSE, USA

4:30 PM

(EMA-186-2022) Effects of carbon nanotube length on magneto-transport of de-doped/Li-doped/SbF5-doped solution spun fibers (Invited)

J. Bulmer^{*1}

1. Air Force Research Lab (AFRL), USA

5:00 PM

(EMA-187-2022) Low Temperature Properties of Carbon Nanotubes Bundles and Fibers (Invited)

M. Cirillo^{*1}

1. Università di Roma "Tor Vergata", Dipartimento di Fisica and MINAS Lab, Italy

5:30 PM

(EMA-188-2022) Synthesis of MnO₂ Carbon Nanotubes catalyst with enhanced Oxygen Reduction Reaction for Polymer Electrolyte Membrane Fuel Cell (Invited)

A. Ullah^{*1}

1. University of science and Technology South Korea, Energy, Republic of Korea

S10: Point Defects and Transport in Ceramics

Defect Mobility and Transport Behavior

Room: Cypress B

Session Chair: Kaveh Ahadi, NCSU

10:00 AM - WITHDRAWN

(EMA-127-2022) Electromigration of Oxygen Vacancies and Better Prediction of Failure of Multilayer Ceramic Capacitors (Invited)

C. Randall^{*1}; P. Yousefian²

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

2. Pennsylvania State University, USA

10:30 AM

(EMA-128-2022) Determining the Effect of Burn-in Process on Dynamics of Oxygen Vacancies in X7R Multilayer Ceramic Capacitors

P. Yousefian^{*1}; C. Randall¹

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

10:45 AM

(EMA-129-2022) The role of defects on the ionic conductivity in yttria-stabilized zirconia (Invited)

B. Feng^{*1}; N. Shibata¹; Y. Ikuhara²

1. The University of Tokyo, Japan

2. University of Tokyo, Institute of Engineering Innovation, Japan

11:15 AM

(EMA-130-2022) Low temperature cation and anion diffusion in single crystal Fe₂O₃

T. Kaspar^{*1}; K. Yano³; A. A. Kohnert²; B. Matthews³; S. R. Spurgeon⁴; Z. Zhu⁵; D. Schreiber³

1. Pacific Northwest National Lab, Physical and Computational Sciences Directorate, USA

2. Los Alamos National Lab, Materials Science and Technology, USA

3. Energy and Environment Directorate, Pacific Northwest National Laboratory, USA

4. Pacific Northwest National Laboratory, Energy and Environment Directorate, USA

5. Pacific Northwest National Laboratory, Environmental Molecular Sciences Laboratory, USA

11:30 AM

(EMA-131-2022) Oxygen vacancy and polarization dynamics in (Bi_{0.5}Na_{0.5})TiO₃ ferroelectrics

Z. Fan^{*1}; C. Randall²

1. Pennsylvania State University, USA

2. Penn State University, Materials Science and Engineering, USA

11:45 AM

(EMA-132-2022) Point defect transport and self-diffusion in hematite and chromia thin films (Invited)

A. A. Kohnert^{*2}; A. Banerjee²; K. Yano¹; T. Kaspar¹; E. F. Holby³; D. Schreiber¹; B. P. Uberuaga²

1. Pacific Northwest National Lab, Physical and Computational Sciences Directorate, USA

2. Los Alamos National Laboratory, Materials Science and Technology Division, USA

3. Los Alamos National Lab, Sigma Division, USA

S14: Functional Materials for Biological Applications

Functional Materials for Biological Applications

Room: Cypress B

Session Chairs: Jennifer Andrew, University of Florida

2:00 PM

(EMA-189-2022) Active microenvironments for tissue regeneration and related applications (Invited)

S. Lanceros-Mendez^{*1}

1. BCMaterials, Basque Center for Materials, Applications and Nanostructures, Spain

2:30 PM

(EMA-190-2022) Functional Materials: Definition, Origin and Improvement of Functionality of Materials (Invited)

M. Yoshimura^{*1}

1. National Cheng Kung University, Mater. Sci. & Eng., Taiwan

3:00 PM

(EMA-191-2022) Piezoelectric components for active hearing implants (Invited)

T. M. Eßinger¹; M. Koch¹; M. Bornitz^{*1}; M. Neudert¹

1. Technische Universität Dresden, Faculty of Medicine Carl Gustav Carus, Germany

3:30 PM

(EMA-192-2022) Ultra-compact Dual-band Smart NEMS Magnetoelectric Antennas for Simultaneous Wireless Energy Harvesting and Magnetic Field Sensing (Invited)

M. Zaeimbashi¹; M. Nasrollahpour¹; A. Khalifa²; A. Romano¹; X. Liang¹; H. Chen¹; N. Sun¹; A. Matyushov¹; H. Lin¹; C. Dong^{*1}; Z. Xu¹; A. Mittal¹; I. Martos-Repath¹; G. Jha¹; N. Mirchandani¹

D. Das¹; M. Onabajo¹; A. Shrivastava¹; S. Cash²; N. Sun¹

1. Northeastern University, Electrical Engineering, USA

2. Harvard Medical School, Department of Neurology, USA

4:00 PM

Break

S15: Advanced Microelectronics

Memristors and Neuromorphic Computing

Room: Magnolia B/C

Session Chairs: Matthew Brahlek, Oak Ridge National Lab

10:00 AM

(EMA-133-2022) Effects of Defects and Interface on Interface-type Forming-free Memristors

A. Chen^{*1}

1. Los Alamos National Lab, USA

Final Program

Friday, January 21, 2022

10:15 AM

(EMA-134-2022) Microstructural and switching dynamics studies in VO₂ devices

H. Yu*¹; S. Ramanathan¹

1. Purdue University-west Lafayette, Materials Engineering, USA

10:30 AM

(EMA-135-2022) Non-volatile Charge Configuration Memory devices for use in cryocomputing environment

A. Mraz^{*1}; R. Venturini¹; M. Diego²; A. Kranjec¹; D. Svetin¹; Y. Gerasimenko³; V. Sever¹; I. Mihailovic⁴; J. Ravnik⁵; I. Vaskivskyi⁶; M. D'Antuono⁶; D. Stornaiulo⁶; F. Tafuri⁶; D. Kazazis⁵; Y. Ekinici⁵; V. Kabanova⁶; D. Mihailovic¹

1. Jozef Stefan Institute, F7, Slovenia
2. Claude Bernard University Lyon 1, France
3. University of Regensburg, Germany
4. ETH Zurich, Switzerland
5. Paul Scherrer Institut, Switzerland
6. University of Naples Federico II, Italy

10:45 AM

(EMA-136-2022) Achieving High Performance Resistive Switching Using Ionic Thin Films

M. Xiao^{*1}; C. Yun¹; M. Elshenawy¹; Z. Sun¹; M. Wells¹; M. Hellenbrand¹; J. MacManus-Driscoll²

1. University of Cambridge, United Kingdom

2. University of Cambridge, Dept. of Materials Science, United Kingdom

11:00 AM

(EMA-137-2022) Memristive Materials and Devices for Neuromorphic Computing (Invited)

J. Yang^{*1}

1. University of Southern California, Electrical and Computer Engineering Department, USA

11:30 AM

(EMA-138-2022) A Dynamical Compact Model of Diffusive and Drift Memristors for Neuromorphic Computing

Y. Zhuo^{*1}

1. University of Southern California, ECE, USA

11:45 AM

(EMA-139-2022) Electronic transport mechanisms in hydrogenated perovskite nickelate memristors

Q. Wang^{*1}; Z. Zhang²; S. Ramanathan¹

1. Purdue University, Materials Engineering, USA

2. Xi'an Jiaotong University, China

12:00 PM

(EMA-140-2022) Cold Sintering and Cold Flow of MAPbBr₃ for Large-Area Radiation Detectors

M. Tolchin^{*1}; S. Lowum¹; I. Dursun²; N. C. Giebink²; J. Maria¹

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

2. Pennsylvania State University, Electrical Engineering, USA

Complex Oxides for Device Applications

Room: Magnolia B/C

Session Chairs: Anand Bhattacharya, Argonne National Laboratory

2:00 PM

(EMA-193-2022) Electrode Chemistry Influence on Hafnium Zirconium Oxide Ferroelectric Performance (Invited)

J. Ihlefeld^{*1}; S. Fields¹; S. W. Smith²; S. T. Jaszewski¹; M. D. Henry³; S. L. Wolfley³; P. J. Ryan⁴; C. Fancher⁵; G. Esteves⁵; P. S. Davids³

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

2. Radiant Technologies, USA

3. Sandia National Laboratories, USA

4. Argonne National Lab, Advanced Photon Source, USA

5. Oak Ridge National Lab, USA

2:30 PM

(EMA-194-2022) Development of sputtered gate oxides for wide bandgap semiconductors devices

L. Shvilberg^{*1}; T. Mimura¹; J. J. Wierer²; E. A. Paisley²; J. Ihlefeld¹

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

2. Sandia National Laboratories, USA

3. North Carolina State University, Department of Electrical and Computer Engineering, USA

*Denotes Presenter

2:45 PM

(EMA-195-2022) Self-biased electric control of magnetism at room temperature in single layer composite films, harnessing the interplay of antiferromagnetism, ferrimagnetism and ferroelectricity (Invited)

J. MacManus-Driscoll^{*1}

1. University of Cambridge, Dept. of Materials Science, United Kingdom

3:15 PM

(EMA-196-2022) Plasmon Induced Hot Electron in Metal Nanostructures for Enhancing Performance of Photodetectors

S. Kunwar^{*1}; A. Chen¹

1. Los Alamos National Lab, USA

3:30 PM

Break

4:00 PM

(EMA-197-2022) Unit-cell-scale ferroelectricity : Flat band breaks the 100-year-old myth of necessitating domains (Invited)

J. Lee^{*1}

1. Ulsan National Institute of Science & Technology, Republic of Korea

4:30 PM

(EMA-198-2022) Extreme tensile strain states in complex oxide membranes (Invited)

S. Hong^{*1}

1. UC Davis, USA

Friday, January 21, 2022

S4: Complex Oxide Thin Films and Heterostructures: From Synthesis to Strain/Interface-engineered Emergent Properties

Strain, Microstructures and Functionality Tuning

Room: Orange A

Session Chair: Sangmoon Yoon, Oak Ridge National Lab

8:30 AM

(EMA-199-2022) Engineering Metastable 4d and 5d Complex Oxide Films for Emergent Interfacial Phenomena by Hybrid Molecular Beam Epitaxy (Invited)

R. B. Comes^{*1}

1. Auburn University, Dept. of Physics, USA

(EMA-200-2022) Examination of Biaxial Stresses Produced by the Clamping Effect in HZO Thin Films (Invited)

S. Fields^{*1}; T. Cai³; S. T. Jaszewski²; B. Sheldon³; J. Ihlefeld¹

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

2. University of Virginia, Materials Science and Engineering, USA

3. Brown University, School of Engineering, USA

9:15 AM

(EMA-201-2022) A thin defective layer formation in yttria-stabilized zirconia and its ferromagnetism

S. Ryu^{*1}; D. Cho¹; J. Park²; J. Lee²; T. Hong³; M. Byeon³; H. Jeen¹

1. Pusan National University, Republic of Korea

2. Korea Atomic Energy Research Institute, Korea Multi-Purpose Accelerator Complex, Republic of Korea

3. Korea Basic Science Institute, Busan Center, Republic of Korea

9:30 AM

(EMA-202-2022) Strain induced negative thermal expansion in molecular beam epitaxy grown LaVO₃ thin films

K. Noordhoek^{1*}; A. R. Mazza¹; J. M. Lapano¹; T. Z. Ward¹; R. Engel-Herbert²; V. R. Cooper¹; Y. Cao³; M. Brahlek¹

1. Oak Ridge National Laboratory, Materials Science and Technology Division, USA
2. Pennsylvania State University, Department of Materials Science and Engineering, USA
3. Argonne National Lab, Materials Science Division, USA

9:45 AM - WITHDRAWN

(EMA-203-2022) Effect of the strain and polar defect on dielectric, ferroelectric, and energy storage properties of epitaxial relaxor ferroelectric thin films

J. Belhadji^{1*}; U. Trstenjak²; D. Fabijan²; D. Vengust²; N. Daneu²; M. Benyoussef¹; M. El Marssi²; V. Bobnar⁴; M. Spreitzer⁵

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

10:00 AM

Break

Characterizations of Strain, Defects, and Interfaces

Room: Orange A

Session Chair: Ryan Comes, Auburn University

10:30 AM

(EMA-243-2022) Understanding interfacial stabilization and disorder for highly metallic epitaxial delafossites (Invited)

S. Yoon^{1*}; J. Ok¹; A. Huon¹; T. Ichiba¹; M. Yoon¹; S. Yeom²; F. R. Reboredo¹; A. R. Lupini¹; H. Lee¹

1. Oak Ridge National Lab, USA
2. University of Tennessee, USA

11:00 AM

(EMA-244-2022) Autonomous exploration of nanoscale strain with active learning in 4D-STEM

K. M. Roccapriore^{*}; M. Ziatdinov¹; O. Dyck¹; S. Kalinin¹

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

11:15 AM

(EMA-245-2022) Structural evolution of oxide heterostructures: Thermal, optical, and electronic characterization via ultrafast spectroscopic methods

J. Tomko^{1*}; S. Hoseini Makrem²; E. Hogland²; R. Ramesh³; P. E. Hopkins⁴

1. University of Virginia, Mechanical and Aerospace Engineering, USA
2. University of Virginia, Materials Science and Engineering, USA
3. UC Berkeley, MSE/Physics, USA

11:30 AM

(EMA-246-2022) Cooling rate dependence of structure and composition in (Nd,Li)TiO₃/SrTiO₃ thin films deposited by PLD

E. Farghadany^{1*}; N. Bagués³; H. B. Smith¹; B. Powers Beggs²; D. W. McComb³; A. Sehirlioglu⁴

1. Case Western Reserve University, Materials Science and Engineering, USA
2. Case Western Reserve University, Materials Science and Engineering, USA
3. The Ohio State University, USA
4. Case Western Reserve University, USA

11:45 AM - WITHDRAWN

(EMA-247-2022) Calorimetric and Thermogravitational Characterization of Y_{0.2}La_{0.2}Ce_{0.2}Pr_{0.2}Sm_{0.2}O_{2-δ} Solid Solutions

C. Skidmore^{1*}; G. N. Kotsonis²; J. Maria²

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

12:00 PM

(EMA-248-2022) Aqueous chemical deposition of K_{0.5}Na_{0.5}NbO₃ ferroelectric thin films

A. Z. Mohammed^{1*}; S. R. Burns²

1. University of Calgary, Chemistry, Canada
2. University of Calgary, Canada

Controlled Synthesis of Lateral and Vertical Heteroepitaxial Thin Films and Nanocomposites III

Room: Orange A

Session Chair: Aiping Chen, Los Alamos National Lab

2:00 PM

(EMA-259-2022) Strain induced magnetism in PdCoO₂ (Invited)

M. Brahlek^{1*}

1. Oak Ridge National Lab, USA

2:30 PM

(EMA-260-2022) Superconductivity in low-valence layered nickelates (Invited)

A. S. Botana^{1*}

1. Arizona State University, Physics, USA

2:45 PM

(EMA-261-2022) Approach to the practical magnetoelectrics with the vertically aligned nanocomposites (Invited)

R. Wu^{1*}; S. Cho¹; T. Maity¹; D. Zhang²; A. Kursumovic¹; P. Lu³; H. Wang⁴; J. MacManus-Driscoll⁵

1. University of Cambridge, United Kingdom

2. Purdue University, Materials Engineering, USA

3. Sandia National Laboratories, USA

4. Purdue University, School of Materials Engineering, USA

5. University of Cambridge, Dept. of Materials Science, United Kingdom

3:00 PM - WITHDRAWN

(EMA-262-2022) Disorder driven electronic and magnetic phases in high entropy oxide nickelates

A. R. Mazza^{1*}; J. M. Lapano¹; M. Brahlek¹; T. Z. Ward¹

1. Oak Ridge National Laboratory, USA

3:15 PM

(EMA-263-2022) Infrared optoelectronic and magneto-optic properties in Gd-doped Cd-doped Cd

A. Cleri^{1*}; J. Murphy²; J. R. Schrecengost³; N. C. Giebink²; J. Maria¹

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

2. Pennsylvania State University, Electrical Engineering, USA

3:30 PM

Break

S5: Mesoscale Phenomena in Ferroic Nanostructures: From Patterns to Functionalities

Applications involving Electronic, Magnetic, Thermal, Optical, and Electrochemical Functionalities

Room: Cypress B

Session Chair: Ed Gorzkowski, U.S. Naval Research Laboratory

8:30 AM

(EMA-204-2022) Unexpected Temperature-Dependence Mesoscale Polarization in Ferroelectrics

Y. Ivry^{*}

1. Technion - Israel Institute of Technology, Israel

8:45 AM

(EMA-205-2022) Enhanced ferroelectricity in Hf_{0.5}Zr_{0.5}O₂ film using oxygen-providing electrodes (Invited)

M. Park^{1*}; K. Yang²; G. Yu²; S. Kim²; D. Lee²; J. Park²; G. Park²

1. Seoul National University, Department of Materials Science and Engineering, Republic of Korea

2. Pusan National University, School of Materials Science and Engineering, Republic of Korea

Final Program

Friday, January 21, 2022

9:15 AM

(EMA-206-2022) Strain effect on relaxor ferroelectric domains in epitaxial PMN-PT/SRO heterostructures

M. Spreitzer^{*1}; J. Belhadi¹; U. Trstenjak¹

1. Jozef Stefan Institute, Advanced Materials, Slovenia

9:30 AM

(EMA-207-2022) Hafnia-based ferroelectric tunnel junctions (Invited)

B. Prasad^{*1}; V. Thakare²; Z. Zhang²; A. Kalitsov¹; T. Santos¹; R. Ramesh³

1. Western Digital, USA

2. University of California, Materials Science and Engineering, USA

3. UC Berkeley, MSE/Physics, USA

10:00 AM

Break

Chemistry and Physics of Ferroic Materials at Mesoscale

Room: Cypress B

Session Chair: Binod Paudel, New Mexico State University; Yogesh Sharma, Los Alamos National Lab

10:30 AM

(EMA-249-2022) Multi-objective Bayesian optimization of functional materials responses for memory and energy storage applications

A. Biswas^{*1}; A. Morozovska²; M. Ziatdinov³; E. Eliseev⁴; S. Kalinin¹

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

2. Institute of Physics, National Academy of Sciences of Ukraine, Ukraine

3. Oak Ridge National Laboratory, Computational Sciences and Engineering Division, USA

4. National Academy of Sciences of Ukraine, Institute for Problems of Materials Science, Ukraine

10:45 AM

(EMA-250-2022) Exotic Dipolar Structures and Properties in Ferroelectric Superlattices (Invited)

L. W. Martin^{*1}

1. University of California, Berkeley, Materials Science and Engineering, USA

11:15 AM

(EMA-251-2022) Atomic-scale electromechanical effects of individual oxygen vacancies at ferroelectric domain walls

Elangovan^{*1}; M. Barzilay¹; A. Hershkovitz¹; J. Huang²; S. Liu²; S. Cohen³; Y. Ivry¹

1. Technion Israel Institute of Technology, Department of Materials Engineering, Israel

2. Westlake University, China

3. Nuclear Research Centre-Negev, Israel

11:30 AM

(EMA-252-2022) Electrostatically Mediated Polar Topologies and Switching Dynamics in Dielectric-Ferroelectric Nanocomposites

K. Co^{*1}; J. Mangeri²; P. Alpay²; S. Nakhmanson²

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

2. University of Connecticut, Materials Science and Engineering, USA

3. Luxembourg Institute of Science and Technology, Materials Research and Technology, Luxembourg

11:45 AM - WITHDRAWN

(EMA-253-2022) 3D structure–property correlations of emerging ferroelectric materials revealed by tomographic atomic force microscopy (Invited)

J. SONG^{*1}; S. T. Jaszewski²; S. Wang³; A. Chen⁴; L. You³; J. Ihlefeld²; B. Huey¹

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

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

3. Soochow University, School of Physical Science and Technology, China

4. Los Alamos National Lab, USA

Synthesis, Characterization, and Processing

Room: Cypress B

Session Chair: Kevin Co, University of Connecticut

2:00 PM

(EMA-264-2022) Mg²⁺ Diffusion-Induced Structural and Property Evolution in Epitaxial Fe₃O₄ Thin Films (Invited)

Y. Du^{*1}

1. PNNL, USA

2:30 PM

(EMA-265-2022) Strain tuning of magnetic and optical properties in epitaxial rare earth chromide single crystal thin films

B. Paudel^{*1}; Y. Sharma²; A. Chen²; Y. Du¹

1. Pacific Northwest National Laboratory, USA

2. Los Alamos National Laboratory, USA

2:45 PM

(EMA-266-2022) Flexo-phototronic Effect in Centro-symmetric BiVO₄ Epitaxial Films (Invited)

P. Shao¹; Y. Chu^{*1}

1. National Chiao Tung University, Materials Science and Engineering, Taiwan

3:15 PM

(EMA-267-2022) Modeling Thermoelectric Properties of Polycrystalline Materials at Mesoscale

D. Basula^{*1}; M. Daeipour¹; L. Kuna²; J. Mangeri³; B. Feygelson²; S. Nakhmanson⁴

1. University of Connecticut, USA

2. U.S. Naval Research Laboratory, USA

3. Luxembourg Institute of Science and Technology, Luxembourg

4. University of Connecticut, Materials Science and Engineering, USA

S7: Superconducting and Related Materials: From Basic Science to Applications

Applied Superconductors: Flux Pinning and Critical Currents

Room: Orange B

Session Chair: Michael Sumption, Ohio State University

8:30 AM

(EMA-208-2022) Comparison of current and loss metrics for superconductors, cryo-conductors, and CNT based composites at high frequencies for aircraft propulsion applications, comparison to conventional conductors (Invited)

M. D. Sumption^{*1}

1. Ohio State University, MSE, USA

9:00 AM

(EMA-209-2022) Application of metamaterial nano-engineering for increasing the superconducting critical temperature (Invited)

M. Osofsky^{*1}; V. Smolyaninova²; J. Prestigiacomo¹; H. Kim¹; N. Bassim³; I. Smolyaninov⁴

1. Naval Research Laboratory, USA

2. Towson University, USA

3. McMaster University, Materials Science and Engineering, Canada

4. University of Maryland, Electrical and Computer Engineering, USA

9:30 AM

(EMA-210-2022) Search for Advanced Electric Conductors for Aerospace Applications (Invited)

T. J. Haugan^{*1}; C. Kovacs²

1. U.S. Air Force Research Laboratory, Aerospace Systems Directorate, USA

2. Scintillating Solutions LLC, USA

10:00 AM

Break

10:30 AM

(EMA-211-2022) Increased Current Density and Pinning Force in Ca-Doped $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ / BaZrO_3 Multilayer Thin Films

M. Sebastian^{*1}; V. Ogunjimi²; B. Gautam²; C. Ebbing¹; D. Zhang³; J. Jian³; J. Huang³; Y. Zhang³; H. Wang³; J. Wu²; T. J. Haugan⁴

1. University of Dayton Research Institute, USA
2. University of Kansas, USA
3. Purdue University, Materials Engineering, USA
4. Air Force Research Lab, Aerospace Systems Directorate, USA
5. Purdue University, Materials Engineering, USA

10:45 AM - WITHDRAWN

(EMA-212-2022) Magnetization Creep of $\text{Y}_1\text{Ba}_2\text{Cu}_3\text{O}_{7-x}$ Thin Films with Columnar Y_2BaCuO_5 and BaZrO_3 Pinning Centers Additions (Invited)

C. Myers^{*1}; M. A. Susner²; M. Sebastian³; D. Zhang⁶; J. Wu⁵; H. Wang⁷; M. D. Sumption⁸; T. J. Haugan⁴

1. Lawrence Berkeley National Laboratory, ATAP/BCMT, USA
2. The Air Force Research Laboratory, USA
3. UDR, USA
4. U.S. Air Force Research Laboratory, Aerospace Systems Directorate, USA
5. University of Kansas, USA
6. Purdue University, Materials Engineering, USA
7. Purdue University, School of Materials Engineering, USA
8. Ohio State University, MSE, USA

S8: Structure–Property Relationships in Relaxor Ceramics

Advanced nano- and Microscale Characterization Methods for Relaxors

Room: Cypress C

Session Chairs: Stephen Funni, North Carolina State University

8:30 AM

(EMA-213-2022) Direct Imaging of Fractal-Dimensional Percolation in the 3D Cluster Dynamics of a Perovskite Supercrystal (Invited)

L. Falsi^{*1}; M. Aversa¹; F. Di Mei¹; D. Pierangeli¹; F. Xin¹; A. Agranat²; E. DelRe¹
1. University of Rome "La Sapienza", Department of Physics, Italy
2. Hebrew University, The Brodsky Center for Innovative Engineering and Computer Science, Israel

9:00 AM

(EMA-214-2022) Maximum Entropy Method for Identifying Disordered Displacements in Relaxors (Invited)

W. Surta^{*1}; M. Rosseinsky¹; J. Claridge¹; A. J. Bell²
1. University of Liverpool, Chemistry, United Kingdom
2. University of Leeds, Institute for Materials Research, United Kingdom

9:30 AM - WITHDRAWN

(EMA-215-2022) Processing-related microstructural features mediating the enhancement of ferroelectric and electrocaloric properties in relaxor ceramics (Invited)

B. Rozic^{*1}; H. Uršič²; L. Fulanovic³; A. Bradesko²; T. Rojac²; V. Bobnar¹; B. Malic²; Z. Kutnjak⁴
1. Jozef Stefan Institute, Department of Condensed Matter Physics, Slovenia
2. Jozef Stefan Institute, Electronic Ceramics Department, Slovenia
3. TU Darmstadt, Nonmetallic-Inorganic Materials, Germany
4. Jozef Stefan Institute, Slovenia

10:00 AM

Break

Local Structure of Relaxors

Room: Cypress C

Session Chairs: Wesley Surta, University of Liverpool; Ilya Grinberg, Bar Ilan University

10:30 AM

(EMA-254-2022) Characterization of local atomic structure of relaxors for energy applications using quantum beams (Invited)

A. Pramanick^{*1}

1. City University of Hong Kong, Materials Science and Engineering, Hong Kong

11:00 AM

(EMA-255-2022) Quantifying local structural correlations in relaxor and classical ferroelectrics through STEM (Invited)

S. Funni^{*1}; S. Calderon¹; E. Dickey¹

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

11:30 AM - WITHDRAWN

(EMA-256-2022) Soft mode and low-frequency lattice dynamics from BaZrO_3 single crystals

C. Toulouse¹; C. Milesi-Brault²; F. Bourdarot⁴; A. Piovano⁴; A. Bossak³; M. Guennou^{*1}

1. University of Luxembourg, Luxembourg
2. Luxembourg Institute of Science and Technology, Luxembourg
3. European Synchrotron Radiation Facility, France
4. Institut Laue Langevin, France

Applications of Relaxors

Room: Cypress C

Session Chairs: Ludovica Falsi, University of Rome, "La Sapienza"; Valentino Cooper, Oak Ridge National Laboratory

11:45 AM

(EMA-257-2022) Lead-free electroceramics for high energy-density multilayer ceramic capacitors (Invited)

G. Wang^{*1}; D. C. Sinclair¹; I. M. Reaney¹; Z. Lu¹; d. wang²

1. University of Sheffield, Materials Science & Engineering, United Kingdom
2. Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

12:15 PM

(EMA-258-2022) Non-ergodic to ergodic relaxor evolution in some Pb-free perovskites

A. Feteira^{*1}

1. Sheffield Hallam University, United Kingdom

Multiscale Modelling and Computational Materials Design of Relaxors

Room: Cypress C

Session Chairs: Antonio Feteira, Sheffield Hallam University

2:00 PM

(EMA-268-2022) Computational design strategy for disordered complex oxides (Invited)

V. R. Cooper^{*1}

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

2:30 PM

(EMA-269-2022) Understanding how composition controls properties in relaxor ferroelectrics (Invited)

I. Grinberg^{*1}

1. Bar Ilan University, Chemistry, Israel

S9: Ion-conducting Ceramics

Ionic-conducting Ceramics for Energy Storage / Synthesis and Processing Conditions on Ionic Conduction

Room: Magnolia A

Session Chair: Hua Zhou, Argonne National Lab

8:30 AM

(EMA-216-2022) Electrochemical properties of $\text{Sr}_3\text{Fe}_{1.8}\text{Co}_{0.2}\text{O}_7$ as solid oxide fuel cell cathode

- A. nemati^{*1}; A. Ghani Harzand²; M. Golmohammad³; A. Malek Khachatourian²
1. Sharif University of Technology, Tehran, Iran, Materials Science & Eng., Islamic Republic of Iran
2. Sharif University of Technology, Materials Science & Eng., Islamic Republic of Iran
3. Niroo Research Institute (NRI), Renewable Energy Department, Islamic Republic of Iran

8:45 AM

(EMA-217-2022) Controlling Defect Fluorites via Oxidative Charge Ordering in $\text{Sc}_2\text{V}_{1-x}\text{Ti}_x\text{O}_{5+\delta}$

- B. N. Richtik^{*1}; D. Vrublevskiy²; C. Wiebe³; M. Bieringer²
1. University of Calgary, Chemistry, Canada
2. University of Manitoba, Chemistry, Canada
3. University of Winnipeg, Chemistry, Canada

9:00 AM

(EMA-223-2022) In Situ Spatially-Resolved Thermal Conductivity Mapping of Battery Cell Degradation

- M. Milich^{*1}; Z. Nie²; G. Koenig²; J. Tomko¹; P. E. Hopkins¹
1. University of Virginia, Mechanical and Aerospace Engineering, USA
2. University of Virginia, Chemical Engineering, USA

9:15 AM

(EMA-218-2022) Effects of Li Vapor Overpressure on the Microstructure, Composition, and Ion Conductivity of Perovskite $\text{Li}_{3x}\text{La}_{1/3-x}\text{TaO}_3$ Ion Conductors

- I. A. Brummel^{*1}; H. J. Brown-Shaklee²; K. Wynne³; W. A. Lanford³; J. Ihlefeld¹
1. University of Virginia, Department of Materials Science and Engineering, USA
2. Sandia National Laboratories, USA
3. State University of New York at Albany, Department of Physics, USA
4.

9:30 AM

(EMA-219-2022) Structure-property relationship of garnet type $\text{Li}_5\text{La}_3(\text{Nb},\text{Ta}_{1-x})_2\text{O}_{12}$ solid-state solution as a function of sintering temperature.

- A. P. Kafle^{*1}; W. Wong_Ng²; B. Dutta³; G. R. Stafford²; V. P. Oleshko²; I. Pegg¹; J. Kaduk⁴
1. The Catholic University of America, Physics, USA
2. National Institute of Standards and Technology, USA
3. Catholic University of America, Physics, USA
4. Northern Central College, Chemistry, USA

9:45 AM - WITHDRAWN

(EMA-220-2022) Cold Sintering of Solid-State Sodium-ion Battery Composites which address Co-sintering and Mixed Conduction Issues

- Z. Grady^{*2}; A. Ndayishimiye¹; Z. Fan¹; C. Randall²
1. Materials Research Institute, USA
2. Penn State University, Materials Science and Engineering, USA

10:00 AM

Break

10:30 AM

(EMA-221-2022) Ultrafast high-temperature sintering of $\text{Li}_2\text{La}_3\text{Zr}_2\text{O}_{12}$ solid electrolyte

- M. Ihrig^{*1}; W. Rheinheimer¹; M. Finsterbusch¹; O. Guillou¹
1. Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Materials Synthesis and Processing (IEK-1), Germany

10:45 AM

(EMA-222-2022) Effect of oxygen vacancy on Li-ion diffusion in the Perovskite-Type Solid Electrolyte

- J. Hwang^{*1}; J. Lee¹; H. Ju²; E. Park²; Y. Kim²; J. Jang²; J. Shim²; Y. Kim²
1. Pusan National University, Physics, Republic of Korea
2. Sungkyunkwan University, Republic of Korea
3. Korea Basic Science Institute (KBSI), Republic of Korea
4. Dongshin University, Republic of Korea

11:00 AM

(EMA-224-2022) Structure-Property Relationships of Calcium Tin Gallate Garnets

- B. Zanca^{*1}; M. Dolgos²
1. University of Calgary, Chemistry, Canada
2. University of Calgary, Canada

S12: 5G Materials and Applications Telecommunications

Measurements

Room: Citrus A

Session Chairs: Florian Bergmann, NIST; Geoff Brennecke, Colorado School of Mines

8:30 AM

(EMA-225-2022) Introduction to the Session 12: Materials and Applications in Telecommunications

- N. Orloff^{*1}
1. NIST, Communications Technology Laboratory, USA

8:45 AM

(EMA-226-2022) Simulation-based resonant imaging of electronic materials for enhanced design in 5G and other emerging technologies (Invited)

- M. Celuch^{*1}; M. Olszewska-Placha¹; J. Rudnicki¹
1. QWED Sp. z o.o., Poland

9:15 AM

(EMA-227-2022) Optical arbitrary waveform generation for 5G millimeter-wave measurement (Invited)

- B. T. Bosworth^{*1}; N. Jungwirth¹; K. Smith¹; J. Cheron¹; F. Quinlan¹; M. Woodson²; J. Morgan⁴; A. Beling⁴; A. Feldman¹; D. Williams¹; N. Orloff²; C. Long¹
1. NIST, USA
2. Freedom Photonics, USA
3. NIST, Communications Technology Laboratory, USA
4. University of Virginia, USA

9:45 AM

(EMA-228-2022) Developing a Standard Reference Material for 5G millimeter wave

- L. Enright^{*2}; G. L. Brennecke¹; N. Orloff²
1. Colorado School of Mines, USA
2. NIST, Communications Technology Laboratory, USA

10:00 AM

Break

10:30 AM

(EMA-229-2022) Innovative Approaches to Solve Low loss Materials Characterization Challenges (Invited)

- U. Ray^{*1}
1. iNEMI, USA

11:00 AM

(EMA-230-2022) Differential measurement techniques for out-of-plane permittivity extraction (Invited)

- M. C. Papac^{*1}; N. Orloff¹
1. NIST, Communications Technology Laboratory, USA

11:30 AM

(EMA-231-2022) Beyond 5G Out-Of-Plane Component of Permittivity Materials Characterization with Latest Commercially Available Solution (Invited)

S. Phommakesone^{*}; D. Kato¹

1. Keysight Technologies, USA

12:00 PM

(EMA-232-2022) Industry Panel: Measurements, simulations, and how to do them (Invited)

N. Orloff^{*}

1. NIST, Communications Technology Laboratory, USA

Materials

Room: Citrus A

Session Chairs: Lucas Enright, National Institute of Standards and Technology

2:00 PM

(EMA-270-2022) Broadband permittivity of fused silica glass to 220 GHz

N. Orloff^{*}

1. NIST, Communications Technology Laboratory, USA

2:15 PM

(EMA-271-2022) High Sc-Content ($x > 0.30$) $\text{Al}_{1-x}\text{Sc}_x\text{N}$ Lamb Wave Piezoelectric RF Resonators (Invited)

G. Esteves^{*}; S. Yen¹; T. Young¹; Z. Tang²; E. Schmidt¹; L. Gastian¹; M. D. Henry¹; T. Bauer¹; C. Nordquist¹; R. Olsson²

1. Sandia National Laboratories, USA

2. University of Pennsylvania, Department of Electrical and Systems Engineering, USA

2:45 PM

(EMA-272-2022) Design and Modeling of Ferroelectric Based Switchable Multilayer Resonators for 5G Filters

W. Peng^{*}; S. Nam¹; M. Zolfaghari Koohi¹; A. Mortazawi¹

1. University of Michigan, Electrical and Computer Engineering, USA

3:00 PM

(EMA-273-2022) Do $\text{SrTiO}_3\text{-PbTiO}_3$ superlattices exhibit negative permittivity?

F. Bergmann^{*}; B. T. Bosworth²; E. Marks²; A. Hagerstrom²; S. Das³; R. Ramesh³; N. Orloff¹

1. NIST, Communications Technology Laboratory, USA

2. NIST, USA

3. UC Berkeley, MSE/Physics, USA

3:15 PM

(EMA-274-2022) High-frequency Dielectric Characterization of BST-loaded, (Meth)acrylate-based Composites

M. K. Forstmeier^{*}; M. Yuan²; S. Perini²; M. Lanagan³; B. M. Foley¹

1. The Pennsylvania State University, Mechanical Engineering, USA

2. The Pennsylvania State University, Materials Research Institute, USA

3. Penn State University, Dept. of Engineering Science and Mechanics, USA

3:30 PM

Break

4:00 PM

(EMA-275-2022) Modeling the relaxor dielectric dispersion of Ba $1-x$ Sr x TiO 3 with a local phase field method

A. Gurung¹; J. Mangeri²; P. Alpay³; S. Nakhamson^{*3}

1. University of Connecticut, Physics, USA

2. Luxembourg Institute of Science and Technology, Materials Research and Technology Department, Luxembourg

3. University of Connecticut, Materials Science and Engineering, USA

4:15 PM

(EMA-276-2022) Multi-Phase Microwave Dielectric Materials for Applications in 5G Wireless Communications

M. D. Hill^{*}; S. Polisetty¹

1. Trans-Tech, Inc., Research and Development, USA

4:30 PM

(EMA-277-2022) Industry Panel: Trends (Invited)

N. Orloff^{*}

1. NIST, Communications Technology Laboratory, USA

S13: Agile Design of Electronic Materials: Aligned Computational and Experimental Approaches and Materials Informatics

Design of Electronic Materials I

Room: Citrus B

Session Chair: Sergey Levchenko, Skolkovo Inst of Science & Tech; Mina Yoon, Oak Ridge National Lab; Payam Kaghazchi, FZ Juelich

8:30 AM

(EMA-233-2022) Combining High Performance First Principles Computation, Monte-Carlo and Machine-Learning Methods for Statistical Mechanics of Materials (Invited)

M. Eisenbach^{*}

1. Oak Ridge National Laboratory, Center for Computational Sciences, USA

9:00 AM

(EMA-234-2022) Enhancing the bond valence representation for prescreening of solid state ionic conductors (Invited)

K. Kameda¹; T. Ariga¹; S. Manzhos^{*1}; M. Ihara¹

1. Tokyo Institute of Technology, School of Materials and Chemical Technology, Japan

9:30 AM

(EMA-235-2022) Accelerating Simulations-Assisted Materials Design Using Machine Learning (Invited)

W. Saidi^{*}

1. University of Pittsburgh, Materials Science, USA

10:00 AM

Break

10:30 AM

(EMA-236-2022) Data-Enhanced Multiscale Theory of Operando Energy Conversion Systems (Invited)

K. Reuter^{*}

1. Fritz Haber Institute of the Max Planck Society, Germany

11:00 AM

(EMA-237-2022) ML Assisted Discovery of Electronic and Energy Materials (Invited)

A. K. Singh^{*}

1. Indian Institute of Science, Materials Research Centre, India

11:30 AM - WITHDRAWN

(EMA-238-2022) Machine Learning enabled Prediction of Adiabatic Temperature Change in Lead-Free BaTiO_3 -based Electrocaloric Ceramics

M. Su^{*3}; R. Grimes³; S. Garg¹; D. Xue²; P. Balachandran³

1. Birla Institute of Technology and Science, India

2. Xi'an Jiaotong University, China

3. University of Virginia, USA

11:45 AM

(EMA-239-2022) The effect of strain and boundary states on the electronic and topological properties ultrathin Bi_2Se_3

S. Kang^{*}; W. Ko¹; M. Brahlék²; R. Moore²; M. Yoon²

1. Oak Ridge National Lab, MSTD, USA

2. Oak Ridge National Lab, USA

12:00 PM - WITHDRAWN

(EMA-240-2022) Deep learning enabled design of optoelectronic organic materials and hybrid organic-inorganic interfaces (Invited)

R. Maurer^{*}

1. University of Warwick, Department of Chemistry, United Kingdom

12:30 PM

(EMA-241-2022) High-throughput first-principles exploration of 2D-tin structures and their topological properties

M. Yoon¹; S. Yeom^{*2}
1. Oak Ridge National Laboratory, USA
2. University of Tennessee, Department of Physics and Astronomy, USA

12:45 PM

(EMA-242-2022) Finding ferroelectric polarization from STEM and STM images

A. Ghosh^{*1}; C. T. Nelson¹; M. Oxley¹; X. Zhang²; M. Ziatdinov¹; I. Takeuchi²; S. Kalinin¹
1. Oak Ridge National Laboratory, USA
2. University of Maryland, USA

Design of Electronic Materials II

Room: Citrus B

Session Chair: Ghanshyam Pilania, Los Alamos National Lab;
Arun Mannodi-Kanakkithodi, Purdue University

2:00 PM

(EMA-278-2022) AI-Driven Design of High Entropy Halide Perovskite Alloys (Invited)

A. Mannodi-Kanakkithodi^{*1}
1. Purdue University, Materials Engineering, USA

2:30 PM

(EMA-279-2022) Data analytics accelerates the experimental discovery of new thermoelectric materials with extremely high figure of merit

Y. Zhong²; X. Hu³; D. Sarker¹; Q. Xia²; C. Yang²; L. Xu⁴; Z. Han^{*1}; S. Levchenko¹; J. Cui²
1. Skolkovo Institute of Science and Technology, Russian Federation
2. Ningbo University of Technology, School of Materials and Chemical Engineering, China
3. Fritz Haber Institute of the Max Planck Society, Germany
4. Hanyang University, Department of Electrical and Biomedical Engineering, Republic of Korea

2:45 PM

(EMA-280-2022) Experimental discovery of structure-property relationships in ferroelectric materials via active learning (Invited)

Y. Liu^{*1}; K. Kelley²; R. Vasudevan¹; H. Funakubo³; S. Trolier-McKinstry⁴; M. Ziatdinov¹; S. Kalinin³
1. Oak Ridge National Lab, USA
2. Oak Ridge National Lab, Center for Nanophase Materials Sciences, USA
3. Tokyo Institute of Technology, Japan
4. Pennsylvania State University, Materials Science and Engineering, USA
5. Oak Ridge National Lab, USA

3:15 PM

Break

3:45 PM

(EMA-281-2022) AtomAI for deep learning for microscopic images

A. Ghosh^{*1}; S. Kalinin¹; M. Ziatdinov¹
1. Oak Ridge National Laboratory, USA

4:00 PM

(EMA-282-2022) Scalable fabrication and microstructure optimization of garnet-based ceramic components (Invited)

D. Fattakhova-Rohlfing^{*1}
1. Forschungszentrum Juelich, Institute of energy and climate research (IEK-1), Germany

-NOTES-

CODE OF CONDUCT AND ANTI-HARASSMENT POLICIES



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:

1. ACerS Executive Director, **Mark Mecklenborg**, ph 614-794-5829 / email: ExecDirector@ceramics.org
2. ACerS President, **Elizabeth Dickey** / 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.

Visit the full Code of Conduct policy at ceramics.org/codeofconduct

Visit the full Anti-Harassment policy at ceramics.org/antiharassment



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