



IEEE International Symposium on Applications of Ferroelectrics (ISAF)  
International Symposium on Integrated Functionalities (ISIF)  
& Piezoresponse Force Microscopy Workshop (PFM)

# ISAF-ISIF-PFM 2023 SYMPOSIUM PROGRAM

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[2023.ieee-isaf.org](https://2023.ieee-isaf.org)



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## Welcome Message from the Chair

It is with great pleasure that we welcome you to the IEEE International Symposium on Applications of Ferroelectrics in Cleveland, Ohio (US), which is joined by Piezoresponse Force Microscopy (PFM) and International Symposium of Integrated Functionalities (ISIF). As we continue to adapt to the new realities post-Covid and apply the lessons learned, this year's conference will include a virtual component, providing an opportunity for those unable to attend in-person due to various reasons such as family, funding, or sustainability concerns. We are aware of the additional burden that uploading videos may place on in-person attendees, but we hope that they will appreciate the chance to contribute to the community members who cannot travel this year. We recognize that this is a new challenge in a changing world, and as scientists and engineers, we are committed to collecting more data and understanding what it means to hold a conference in a post-Covid world, where we can better reach out to people with limitations and where the contribution of travel to an unsustainable life is questioned.

To facilitate discussion beyond the technical aspects of the conference, we have added a new segment to ISAF called "featured invited talks," and this year's theme is sustainability. We hope that this new format will be embraced by future organizers as a way to expand the discussion to our contributions as citizens of the world beyond technical achievements. We are proud to include several training and discussion sessions aimed at promoting diversity and inclusion within IEEE-UFFC. As always, we will have the WIE event with a focus on young females in research and academia, particularly those from underprivileged backgrounds, as they make decisions about their future careers after graduation. Additionally, we will include the first-ever LGBTQ+ focused ally training event, which aims to create a safe zone for members who identify as such. We continue to prioritize our students' experiences and aim to make ISAF a student-oriented conference by offering many student events, including opportunities for social connections and professional development.

We extend our gratitude to the numerous volunteers who made this conference possible. Please take a moment to recognize their names in this booklet and on the website and express your appreciation to them in person. Without their efforts, this conference would not have happened.

Cleveland is a city with a rich history connected to ferroelectrics. It is the home of Joseph Valasek, who discovered ferroelectricity at the University of Minnesota, and the Clevite company, where many of the doping strategies of PZT were developed under the leadership of Dr. Hans Jaffe. Clevite company was also the home for Don Berlincourt, Bernard Jaffe, Helmut Krueger and William Cook, as well as Prof. Eric Cross, who made it his first stop after his Ph.D. The Hans Jaffe Ultrasonics Lab is still located at Case Western Reserve University (CWRU) and has been updated and functional under the leadership of several faculty members in Electrical and Electronics Engineering over the years.

We are grateful to Ferrocom for placing their trust in us and allowing us to hold ISAF in Cleveland this year. We hope you will enjoy both the conference and the city.

Best Regards,

Alp Sehirlioglu, General Chair, Case Western Reserve University, USA

## 2023 ISAF-ISIF-PFM Joint Conference Organizers

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### GENERAL CHAIR & ISAF CHAIR

Alp Sehirlioglu  
*Case Western Reserve University, USA*

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### ISIF CO-CHAIR

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*Institut de Ciència de Materials de Barcelona  
(ICMAB-CSIC), Spain*

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### STUDENT EVENTS CHAIR

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*University of Geneva, Switzerland*

Brooke Richtik  
*University of Calgary, Canada.*

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### POSTER COMPETITION CHAIR

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## Technical Program Committees

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Wook Jo  
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Do-Kyun Kwon  
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Soonil Lee  
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Yun Liu  
Barbara Malic

Jp Maria  
Hajime Nagata  
Ron Polcawich  
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Qifa Zhou

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### Conference Sponsors



### Partners





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## Plenary Speakers



**Jan Seidel**

*Professor, UNSW Sydney*

### **Functional Topological Defects: Materials at the Edge of Order**

**Abstract:** The study of fundamental properties of topological structures and their exploitation constitutes an emerging field in condensed matter research with new concepts being brought forward. I will discuss our recent work on various ferroelectric and multiferroic material systems using scanning probe microscopy as the main investigative tool, including a new method to investigate crackling noise of individual domain walls.

#### **Biography:**

Educational Background:

- Dr. rer. nat. (physics), TU Dresden, 2005

Professional Experience:

- since 2017, Professor, School of Materials Science & Engineering, UNSW Sydney
- 2015-2017, Associate Professor, UNSW Sydney
- 2016, Visiting Fellow, Materials Department, University of Oxford 2012-2014, Senior Lecturer & ARC Future Fellow, UNSW Sydney
- 2008-2011, Research Scientist, Materials Sciences Division, Lawrence Berkeley National Laboratory
- 2006-2007, Humboldt Fellow, Department of Physics, University of California, Berkeley
- 2001-2006, Research Associate, Institute of Applied Photophysics, TU Dresden

Academic Honors/Awards

- 2019 UNSW Outstanding Research Supervisor Award
- 2019 Asia-Pacific PFM 2019 travel award
- 2018 Arc Postgraduate Council Supervisor Award
- 2017 Arc Postgraduate Council Supervisor Award
- 2016 Visiting Fellowship, St Catherine's College, University of Oxford
- 2016 Visiting Fellowship, Materials Department, University of Oxford
- 2016 Endeavour Executive Fellowship, Australian Government
- 2016 Travel award by The Royal Society
- 2015 Theo Murphy Australian Frontiers of Science travel award, Australian Academy of Science
- 2012-2015 Future Fellowship, Australian Research Council
- 2006-2010 Feodor Lynen Research Fellowship, Alexander von Humboldt Foundation
- 2001-2004 German National Science Foundation (DFG) Graduate Fellowship

Other Experience and Professional Membership:

- Panel Member, Materials Research Society (MRS) Awards Committee
- International Advisory Board Member, Advanced Electronic Materials (Wiley-VCH)
- Editorial Board Member, Materials Today Electronics (Elsevier)



Selected Scientific Publications:

- D. Zhang, P. Schoenherr, P. Sharma, and J. Seidel, Ferroelectric order in van der Waals layered materials, *Nature Reviews Materials* 8, 25 (2023)
- D. Meier, J. Seidel, M. Gregg, R. Ramesh (eds.), *Domain walls: from fundamental properties to nanotechnology concepts*, Oxford (2020), ISBN: 978-0198-86249-9
- J. Seidel, Nanoelectronics based on topological structures, *Nature Materials* 18, 188 (2019)
- J. Seidel (ed.), *Topological structures in ferroic materials: domain walls, vortices and skyrmions*, Springer (2016), ISBN: 978-3-319-25299-5
- P. Milde, D. Köhler, J. Seidel et al., Unwinding of a skyrmion lattice by magnetic monopoles, *Science* 340, 1076 (2013)
- G. Catalan, J. Seidel, R. Ramesh, and J. F. Scott, Domain wall nanoelectronics, *Reviews of Modern Physics* 84, 119 (2012)
- J. Seidel et al., Conduction at domain walls in oxide multiferroics, *Nature Materials* 8, 229 (2009)

## Plenary Speakers (continued)



**Prof. Dr. Hong Wang**

*Southern University of Science and Technology*

### **High-Performance Dielectrics for Passive Integration and Energy Storage**

**Abstract:** With the development of electronic and information system towards miniaturization and high density integration, especially the speedy applications of wireless network and internet of things, it is required that the electronic materials and components should have the matching properties such as high performance, multifunctional, high frequency enabling and low energy consumption. The highlights of recent advances on the novel dielectric ceramics for microwave passive integration and electronic package, dielectric nanocomposites for energy storage applications will be presented, while the remaining challenges and the promising opportunities of the development will be discussed as well.

**Biography:** Hong Wang is a chair professor and dean of Graduate School at the Southern University of Science and Technology, China. Prior, she was a professor at Xi'an Jiaotong University. She received her BS, MS and PhD degrees in electronics materials and devices from Xi'an Jiaotong University. Her main research interests include dielectric materials, multifunctional composites, and dielectric measurements. She has (co)-authored over 350 peer-reviewed papers, 45 patents, and has delivered more than 60 invited talks in international academic conferences. She is a Fellow of IEEE. She was the chair for the Asian Electroceramic Association (AECA) and has been a member of AECA since 2005. She serves as an associate editor for IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control and editorial board members for the Journal of Advanced Ceramics, Journal of Materiomics, the Journal of Chinese Ceramic Society, and IET Nanodielectrics.

## Plenary Speakers (continued)



**Thomas Mikolajick**

*NaMLab gGmbH and Chair of Nanoelectronics TU Dresden*

### **Enhanced functionality of semiconductor devices enabled by ferroelectricity in hafnium oxide**

**Abstract:** Today, almost all aspects of live are influenced or even enabled by systems that require the application of semiconductor devices. Various types of data storage capabilities are essential in such systems and semiconductor memories on all hierarchy levels are becoming even more important by the increasing use of artificial intelligence in electronic systems [1]. Moreover, traditional charge-based memory devices are facing serious scaling limits. Therefore, the effort to bring memories based on other physical mechanisms like ferroelectric polarization, magnetoresistance, phase change, and various resistive switching effects have been continuously increased.

Among these mechanisms, ferroelectric polarization has two important unique selling points. First, in contrast to the other alternatives, the switching is field driven and, therefore, the energy required for writing is the lowest of all options that offer nonvolatility. Second, there are three different options for the readout. Direct sensing of the switched charge in a ferroelectric capacitor, coupling of the polarization to the gate of a field effect transistor and modulation of the resistance of a tunnel junction. Therefore, compared to other mechanisms ferroelectric switching offers higher flexibility of tailoring devices towards the application requirements while still using the same physical mechanism and material system. However, until about 15 years ago, these advantages could only be partially harvested due to the difficulties to integrate well-known ferroelectric materials like lead zirconium titanate or strontium bismuth tantalate etc. into state-of-the-art electronic fabrication processes.

The discovery of ferroelectricity in hafnium oxide [2] changed this situation. In this talk first, the basics of achieving ferroelectricity in ferroelectric hafnium oxide and the options to realize the above-mentioned readout mechanisms in practical devices as well as the status will be shown [3]. Moreover, the benefits of the unique properties for applications were memory and switching are no longer separated like in-memory computing or neuromorphic computing will be illustrated by recent results. Finally, an outlook to future developments including alternative material systems will be given.

**Biography:** Thomas Mikolajick received the Dipl.-Ing. and the Dr.-Ing. In electrical engineering in 1990 and 1996 both from the University Erlangen-Nuremberg. From 1996 till 2006 he was in semiconductor industry (Siemens Semiconductor, Infineon, Qimonda) developing CMOS processes and memory devices with a strong focus on nonvolatile memories. In 2006 he was appointed professor for material science of electron devices at TU Bergakademie Freiberg. Since 2009 he is a professor for nanoelectronics at TU Dresden and in parallel the scientific director of NaMLab GmbH. He is author or co-author of more than 500 publications (current h-index of 79 according to google scholar) and inventor or co-inventor in more than 50 patent families. He is listed as a highly cited researcher in the 2022 edition of Clarivate´s highly cited researchers list. In 2018 he served as the general chair of the IEEE

ESSDERC/ESSCIRC conference in Dresden and in 2020/21/22 as the local chair and in 2023 as the general chair of the IEEE International Memory Workshop (IMW). From 2010 till 2019 he was the speaker of the BMBF leading edge cluster “Cool Silicon”. Currently he is one of the speakers of the center for advancing electronics Dresden (cfaed). Since 2019 he is also the speaker of the BMBF ForLab consortium. He is a member of IEEE since 1999 and received the senior membership status in 2009 and was elevated to the grade of IEEE Fellow for “Contributions to Nonvolatile Memory” in 2023.

## Plenary Speakers (continued)



**Andrew Bell**  
*University of Leeds*

### **Take it to the Limit: A story of piezoelectric materials and devices for extreme conditions**

**Abstract:** This presentation will tell the story of how a curiosity-driven, ferroelectric materials research topic developed into a \$2 million p.a. business, manufacturing industrial ultrasound transducers for use under extreme conditions. On that journey we discovered some interesting materials science, we learnt how to process materials on the edge of instability, we overcame our academic sensitivities in order to finance a spin-out a company and followed some unexpected paths to gain moderate commercial success. The talk aims to provide a contemporary and perhaps idiosyncratic view of both the science and business of piezoelectric materials.

BiFeO<sub>3</sub>-PbTiO<sub>3</sub> is a ferroelectric solid solution with a morphotropic phase boundary (MPB) between the perovskite rhombohedral and tetragonal phases. It has a number of interesting features including the high Curie temperature (635°C at the MPB), an unprecedented spontaneous strain (~20%) on the tetragonal side of the MPB and the >300 K discontinuity in the antiferromagnetic Néel temperature across the MPB. These features provide a number of exciting opportunities in terms of exploiting the high temperature piezoelectricity and coupling the antiferromagnetism to strain and electric field, whilst the extreme tetragonality provides challenges in materials fabrication. Whilst studying these features the Functional Ceramics Group at the University of Leeds discovered methods to overcome the technical barriers to exploiting the piezoelectric properties and to produce materials capable of PZT-like performance up to and beyond 500°C.

In terms of exploitation, as most established piezoelectric materials producers felt that BiFeO<sub>3</sub>-based materials might be a challenge too far, the University of Leeds supported the founding of a company, funded by venture capital and private finance, to commercialise the new material. Although there was a market ready for devices spanning the material's temperature capability, no potential customers had the capability to build the material into high temperature transducers. Hence, what started as a materials company transformed into a device company, with products in the industrial ultrasound, automotive, aerospace and electronics sectors.

**Biography:** Andrew Bell is the IEEE-UFFC Distinguished Lecturer in Ferroelectrics for 2023. He has been Professor of Electronic Materials at the University of Leeds, School of Chemical and Process Engineering since 2000. He previously spent almost 15 years in industrial research posts and 4 years as a Senior Scientist in the Ceramics Laboratory at EPFL, Switzerland. He has undertaken research on a wide range of topics in ferroelectric and dielectric materials, encompassing basic science, materials processing, structural and electrical characterization and device physics, including pyroelectric materials and devices, microwave dielectrics and piezoelectrics. He has published over 200 papers with a total of more than 6000 citations.

From 2000 onwards, his research focussed almost exclusively on piezoelectric materials, particularly on those with capabilities beyond those of PZT. Consequently, in 2011 he founded Ionix Advanced Technologies Ltd to exploit the new high temperature piezoelectric compounds emerging from his research group; the company now manufactures a range of high temperature ultrasound transducers based on these materials.

Prof. Bell was elected a Fellow of the Royal Academy of Engineering in 2016 and was elevated to Fellow of IEEE in 2019. He has received the IEEE's Ferroelectrics Recognition Award (2012), The Robert E Newnham Ferroelectrics Award (2022) and the IEEE-UFFC Distinguished Lecturer Award (2023). He was awarded the Verulam Medal of the Institute of Materials in 2014.



## Invited Speakers

Thor Bakke, Tunable AS, Norway  
Andrew J. Bell, University of Leeds, United Kingdom  
Elena Buixaderas, Fyzikální ústav AV ČR, v. v. i., Institute of Physics of the Czech Academy of Sciences, Czech Rep.  
Yonatan Calahorra, Technion – IIT, Department of Materials Science and Engineering, Israel  
Long-Qing Chen, Pennsylvania State University, Materials Research Institute, United States  
Liam Collins, Oak Ridge National Laboratory, United States  
Runar Plünnecke Dahl-Hansen, SINTEF MiNaLab, Norway  
Laura Davidson, KBR Inc., United States  
Michelle Dolgos, University of Calgary, Canada  
Hiroshi Funakubo, Tokyo Institute of Technology, Japan  
Takuya Hoshina, Tokyo Institute of Technology, Japan  
Jiamian Hu, University of Wisconsin-Madison, United States  
Menka Jain, University of Connecticut, United States  
Pierre-Eymeric Janolin, Université Paris-Saclay, France  
Xiaoning Jiang, North Carolina State University, United States  
Jacob Jones, North Carolina State University, United States  
Isaku Kanno, Kobe University, Japan  
Lynette Keeney, Tyndall National Institute, University College Cork, Ireland  
Kyle P. Kelley, Oak Ridge National Laboratory, United States  
Jason Killgore, National Institute of Standards and Technology, United States  
Yunseok Kim, Sungkyunkwan University, Korea  
Yasuo Koide, National Institute for Materials Science NIMS, Japan  
Fei Li, Xi'an Jiaotong University, China  
Jinglei Li, Xi'an Jiaotong University, China  
Raymond G.P. McQuaid, Queen's University of Belfast, United Kingdom  
Thomas Mikolajick, NaMLab gGmbH, Technische Universität Dresden, Germany  
Beatriz Noheda, University of Groningen, Zernike Institute for Advanced Materials, Netherlands  
Min Hyuk Park, Seoul National University, Korea  
Vladimir Pozdin, Florida International University, United States  
Andrew Rappe, University of Pennsylvania, United States  
Jürgen Rödel, Technical University of Darmstadt, Germany  
Daniel Sando, University of Canterbury, New Zealand  
Jan Seidel, University of New South Wales, Australia  
Barbara Stadlober, Joanneum Research Forschungsgesellschaft mbH, Austria  
Nian Sun, Northeastern University, United States  
Shuji Tanaka, Tohoku University, Japan  
Hiroki Taniguchi, Nagoya University, Japan  
Constance Toulouse, University of Luxembourg, Luxembourg  
Hana Uršič, Jožef Stefan Institute, Slovenia  
Chun-Ming Wang, Shandong University, China  
Hong Wang, Southern University of Science and Technology, China  
Ke Wang, Tsinghua University, China  
Kaiyang Zeng, National University of Singapore, Singapore  
Nan Zhang, Xi'an Jiaotong University, China

## Young Scholar Invited Speakers

Denis Alikin, Universidade de Aveiro, Portugal

Astri Bjørnetun Haugen, Technical University of Denmark, Denmark

Alicia Manjón-Sanz, Oak Ridge National Laboratory, United States

Hiroki Matsuo, Kumamoto University, Japan

Mauro Antonio Pereira Gonçalves, Fyzikální ústav AV ČR, v. v. i., Institute of Physics of the Czech Academy of Sciences, Czech Rep.

Fangping Zhuo, Technical University of Darmstadt, Germany

## Women in Engineering

Wednesday, July 26<sup>th</sup>, 12:00 – 1:30 PM

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### Gender Inequality in Academic/Research Progression

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Younger women in science often face gendered barriers including feeling forced to choose between their future career and having a family, something that is typically a non-issue for young men in science.



The talk by dr. Amy Diehl - **Shattering gender barriers for young women in science** - will overview the six primary barriers which comprise gender bias against women at work. Then we will dive into challenges young women face at the start of their scientific careers, like postdoc time, mobility and CV buildup vs. family obligations - a rocky path to permanent position and financial security.

We will further discuss solutions that leaders, mentors, and colleagues can use to ease the barriers, enabling career success for female scientists, allowing them to reach decision-making positions.

Visible members of our community will join the panel discussion, share their experiences and views.

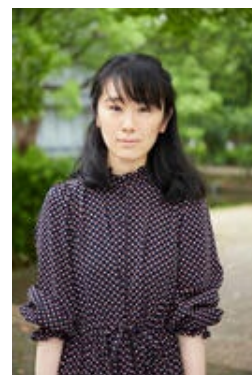
**Beatriz Noheda**



**Elizabeth Dickey**



**Hiroko Yokota**



*Welcome!*

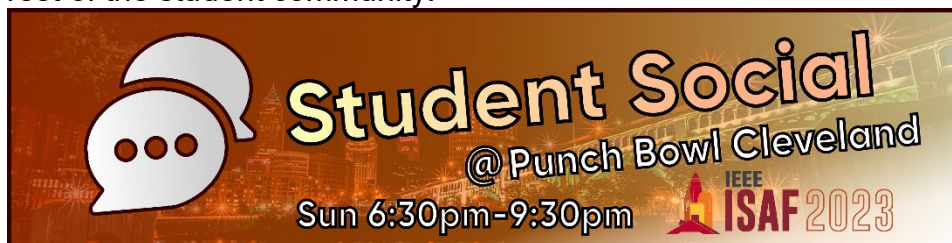
*Moderator:* Mojca Otoničar (Jožef Stefan Institute, Slovenia)

## Student Events

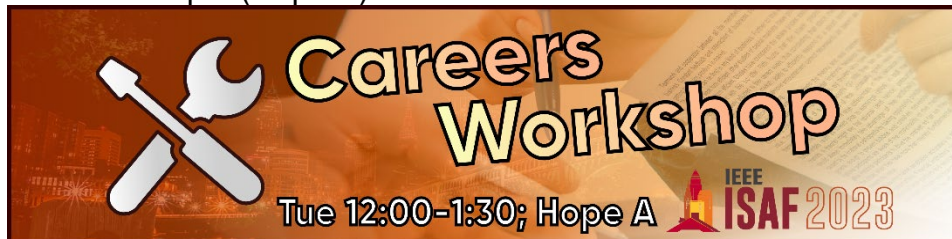
1. **Multimedia Competition:** This is a competition where you can submit your favorite ferroelectric-related multimedia creations to show off to the community. Feel free to submit anything from your favorite diagram or photograph to your most elaborate animation or website. Submissions will be shown during the poster sessions. For more information, and to register, [please click here!](#)



2. **Student Social:** We'll be hosting a **Social Event at Punch Bowl Social Cleveland, 1086 W 11th Street** from 6:30-9:30 PM. This is your chance to make new friends and get to know the rest of the student community!



3. **Careers Workshop:** In this seminar, with volunteers from academia, industry, and beyond, we'll learn how to take your CV and apply for jobs of all different career paths to maximize your chances of getting your dream job when you graduate. Workshop will be held on Tuesday July 25th 12-1:30pm (Hope A).



4. **Student Pitch Competition:** Our yearly event in which you'll get 90 seconds and one slide to talk about your work and research. The best, most exciting, and most accessible presentations will receive prizes. Slots for this event are limited, so sign up now! Presentations be on Wednesday July 26th 5:30-6:30pm (Hope A). [Register here!](#)





## Thursday Cultural Excursion

Thursday afternoon we will have an outing and walk to a summer concert by the historic U.S. coast guard station. The concert is by an 80's cover band (Breakfast Club) from 5 – 8 p.m. Happy hour starts 4pm, including a beer garden and a variety of food offerings featuring local food trucks and Cleveland Metroparks concessions. (<https://www.clevelandmetroparks.com/parks/calendar/summer-concert-series-presented-by-serpentini-chev>)

Please bring cash with you in case the food trucks do not accept credit cards (nowadays most do but we want to cover all the bases).

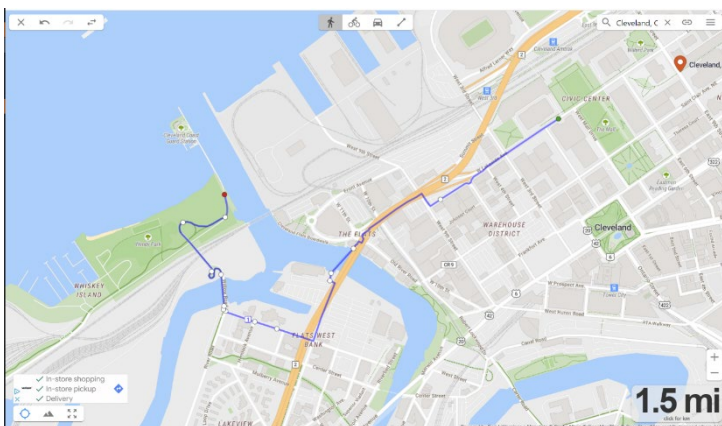
Please register using the link below:

<https://forms.gle/N7GmmD1oWvqqcXJu9>

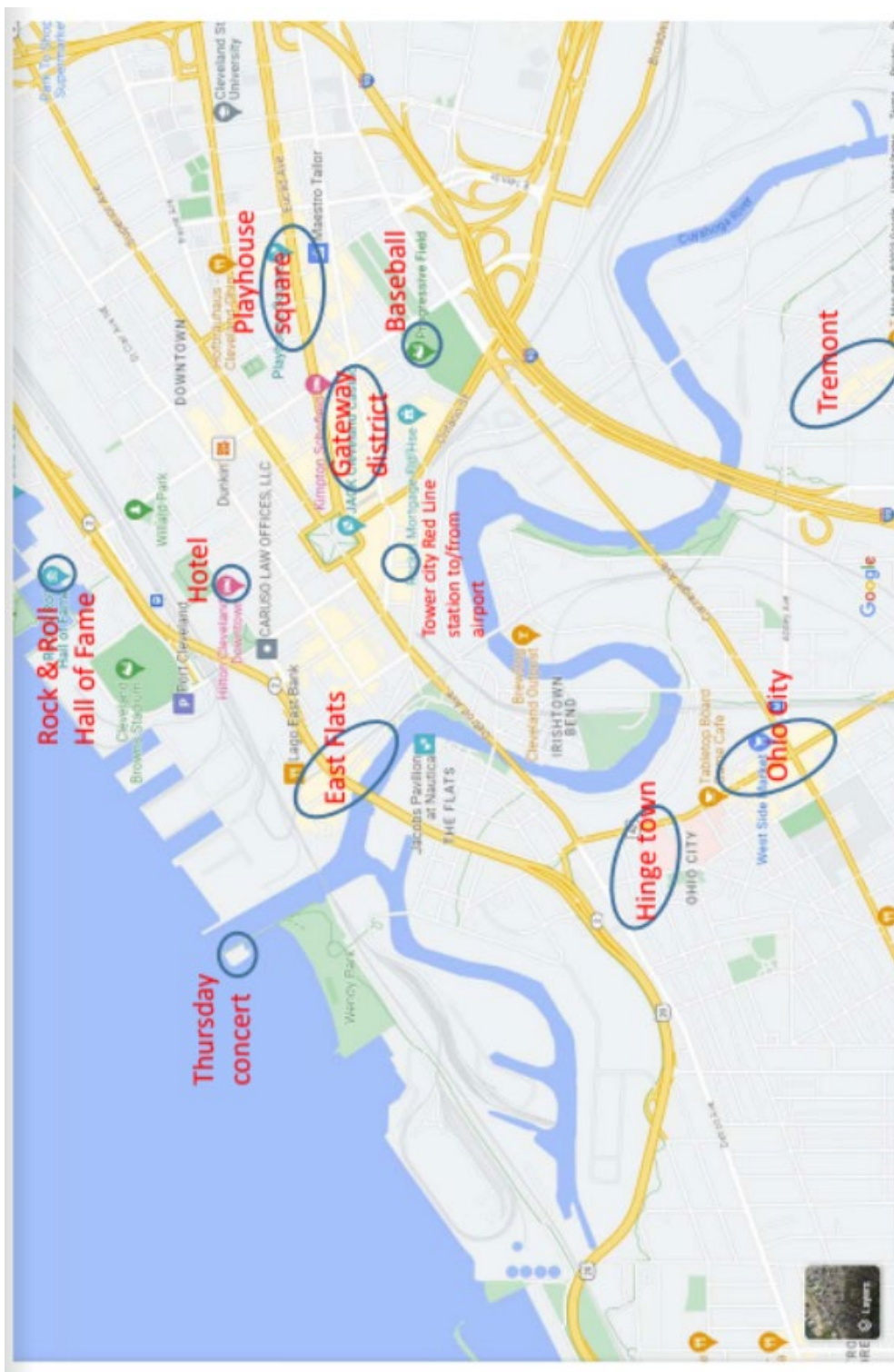
We are asking for your phone number to be able to communicate with you during the event. We will walk there (1.5 miles) and after the event is over at 8 pm we will walk back. However, you are free to leave whenever you want (please let us know if you do so). We want to make sure that nobody will be lost and that everybody has a way to reach out to the group. For that reason, we will add your phone number to a WhatsApp group and will communicate through that group only for this event.

Please let us know if you have mobility issues.

We will meet at 3:30 pm in front of the downtown Hilton and start walking at 3:40 pm. Please see the map below in case you get separated or late. There is a part that looks like you are walking on water. That's a short water taxi ride across the river. If we are more people than the boat can take, we will make several trips so please wait for everyone to cross before continuing walking.

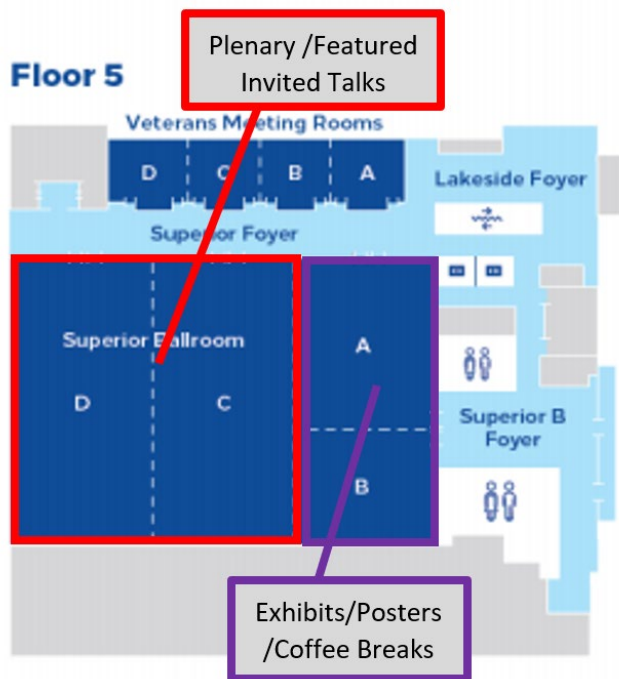
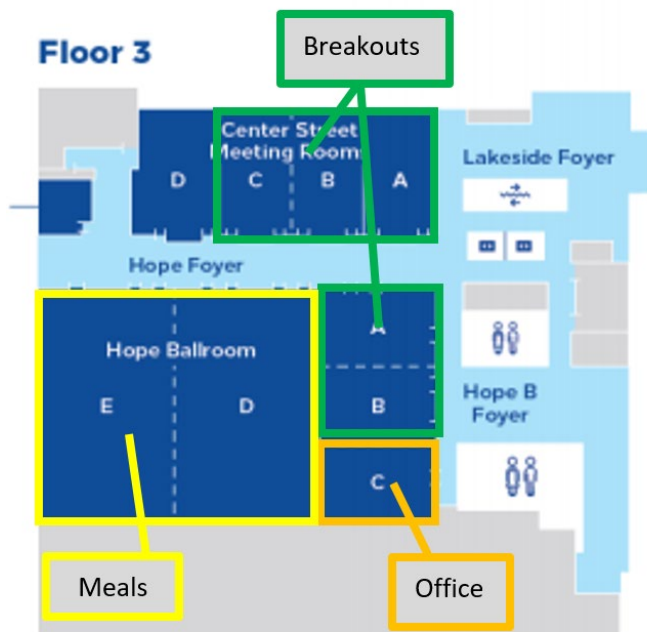


### Nearby Areas of Interest with Dining/Entertainment Options



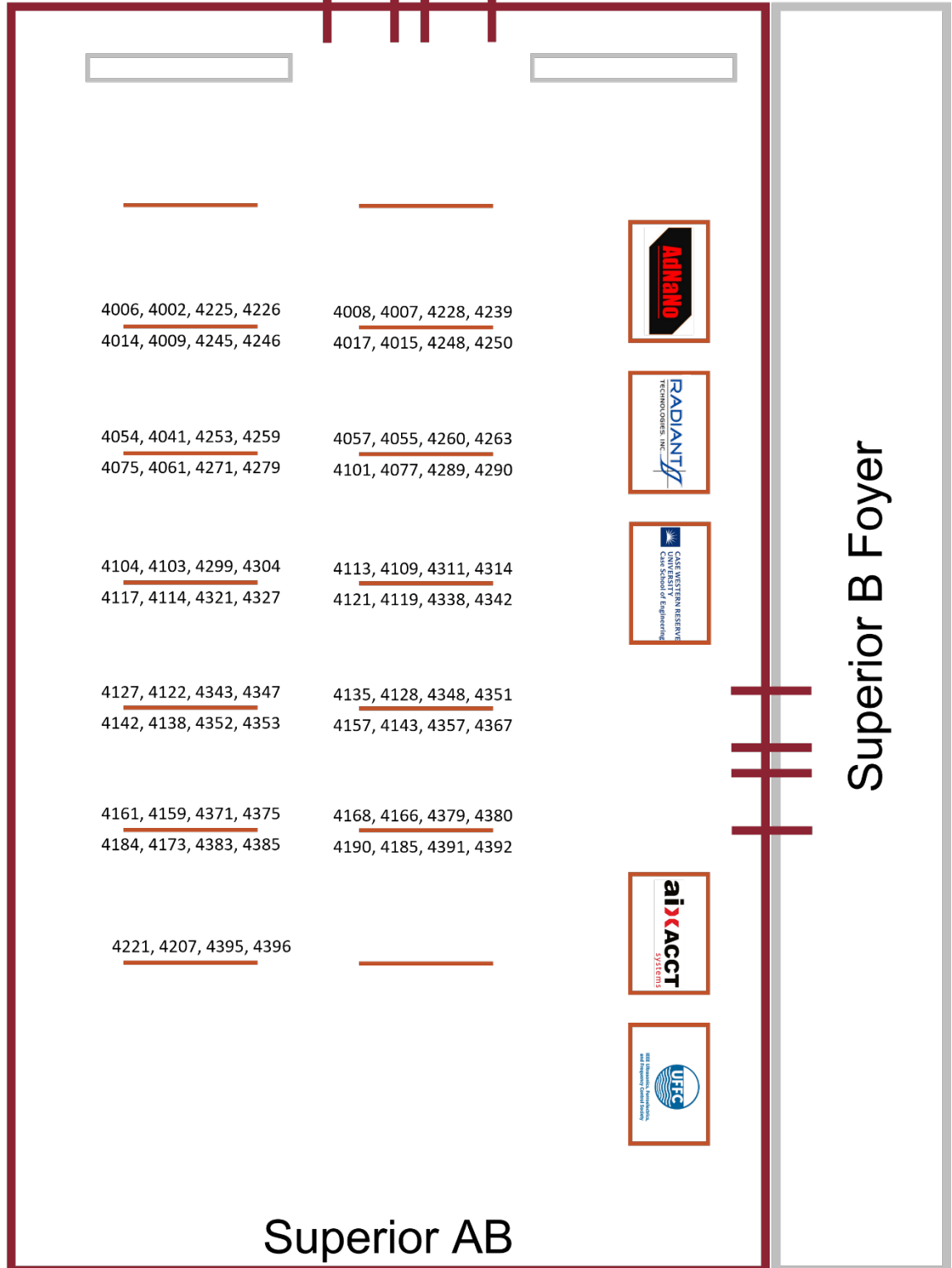


## Floorplan



## Exhibit & Poster Hall

### Floor 5



#### Author Information:

Authors are required to print their own poster and are responsible for hanging up their poster before the start of the session and removing them after the session end.

Authors should be present by their poster for questions for the full length of the session.

#### Exhibitor Information:

##### Set-Up:

- Monday, July 24
- 7:00 – 10:00 AM

##### Clean-Up:

- Thursday, July 27
- 10:30 AM – 12:30 PM

## Program Grid – Sunday, July 23<sup>rd</sup>

Time: ET	Center Street A	Center Street B	Center Street C	Hope C
9:00 – 10:30 AM	<b>Yun Liu</b> Ferroelectrics: General Introduction	<b>Silvia Picozzi</b> Theory and Simulation of Ferroelectric Materials and Related	<b>Satoshi Wada</b> Strain Effects in Ferroelectrics	
10:30 – 11:00 AM	Coffee Break <i>(Hope Ballroom A Foyer)</i>			
11:00 – 12:30 PM	<b>Susan E. Trolier- McKinstry</b> Piezoelectric microelectromechanical systems (In-person ONLY)	<b>Andreas Klein</b> Energy Band Alignment and Band Gaps of (anti)ferroelectrics	<b>JP Maria</b> Cold Sintering of Ferroelectric Materials	<b>ExCom</b> (Invitation ONLY)
12:30 – 2:00 PM	Lunch <i>(Superior A)</i>			
2:00 – 3:30 PM	<b>Laura Bégon-Lours</b> Neuromorphic Computing using Ferroelectric Based Devices	<b>Tony Schenk</b> Memory Applications of Ferroelectric Materials	<b>Neus Domingo</b> Piezoresponse Force Microscopy: electromechanics at the nanoscale	
3:30 – 4:00 PM	Coffee Break <i>(Hope Ballroom A Foyer)</i>			
4:00 – 5:30 PM	<b>Syvia Matzen</b> Photoinduced Effects in Ferroelectric		<b>Ignasi Fina Martínez</b> Electric Characterization of Ferroelectric Films	<b>FerroCom</b> (Invitation ONLY)
6:30 - 9:30 PM	<b>Student Social</b> (Punch Bowl Social Cleveland, 1086 W 11th Street)			

## Program Grid – Monday, July 24<sup>th</sup>

Time: ET	Hope A	Hope B	Center Street A	Center Street B	Center Street C
8:30 – 10:00 AM	Opening Session and Plenary: Prof. Dr. Hong Wang ( <i>Superior Ballroom DC</i> )				
10:00 – 10:30 AM	Coffee Break ( <i>Superior Ballroom AB</i> )				
10:30 – 12:30 PM	Strain Effects on Hafnia Phase Stability	Piezoelectric MEMS & NEMS I	Novel Optical Responses in Ferroelectrics	Domains 1	PFM 1
12:30 – 2:00 PM	Lunch ( <i>Hope Ballroom E</i> )		Training for LGBTQ+ allies Lunch ( <i>Hope C</i> )		
2:00 – 3:30 PM	Hafnia Reliability & Performance	Lead-Free 1	Energy Harvesting	Domains 2	PFM 2
3:30 – 4:00 PM	Coffee Break ( <i>Superior Ballroom AB</i> )				
4:00 – 5:30 PM	Poster Session & Multimedia Competition ( <i>Superior Ballroom AB</i> )				
6:00 – 8:30 PM	Welcome Reception @ The Arcade				

## Program Grid – Tuesday, July 25<sup>th</sup>

Time: ET	Hope D	Hope E	Hope A	Hope B	Center Street A	Center Street B	Center Street C
8:30 – 9:30 AM	Plenary: Dr. Thomas Mikolajick (Superior Ballroom DC)						
9:30 – 10:00 AM	Coffee Break (Superior Ballroom AB)						
10:00 – 12:00 PM			Hafnia-Based Devices	MEMS Material Characterization / Epitaxial Thin Films for MEMS	Energy Storage 1	Lead-Free 2	PFM 3
12:00 – 1:30 PM	Lunch (Hope Ballroom E)			PFM International Board Meeting (Hope C - Invitation ONLY)		Career Workshop (Hope A)	
1:30 – 2:30 PM	Plenary: Prof. Jan Seidel (Superior Ballroom DC)						
2:30 – 3:00 PM	Coffee Break (Superior Ballroom AB)						
3:00 – 5:00 PM	Environment & Biomedical	Single Crystal Piezoelectrics	Oxygen Vacancy & Electrode Effects on Hafnia	Materials for Non-volatile Memory & Neuromorphic Computing	Electrocaloric Effect & Antiferroelectrics	Lead-Free 3	Lead Free Ferroelectric Thin Films
5:30 - 7:00 PM	President's Reception (Invitation ONLY)						
7:00 – 9:00 PM	Optional Tour: Royals at Guardians Baseball Game						

## Program Grid – Wednesday, July 26<sup>th</sup>

Time: ET	Hope A	Hope B	Center Street A	Center Street B	Center Street C
8:30 – 10:00 AM	Featured Invited Talks on Sustainability <i>(Superior Ballroom DC)</i>				
10:00 – 10:30 AM	Coffee Break <i>(Superior Ballroom AB)</i>				
10:30 – 12:00 PM	Wake-up & Thickness Scaling of Wurzite Ferroelectrics	Piezo 1	Piezoelectric MEMS & NEMS 2	Lead-Free 4	Strain Effects on Ferroelectric Thin Films
12:00 – 1:30 PM	Lunch <i>(Hope Ballroom E)</i>			WIE Lunch <i>(Hope C)</i>	
1:30 – 3:30 PM	Wurzite Ferroelectric Properties & Devices	PFM 4	Piezo 2	Single Crystal Applications / Unusual & Novel Properties	Thin Film Devices & Performance
3:30 – 4:00 PM	Coffee Break <i>(Superior Ballroom AB)</i>				
4:00 – 6:00 PM	Poster Session & Multimedia Competition <i>(Superior Ballroom AB)</i>			ISAF 2025 Committee Meeting <i>(Hope C – Invitation ONLY)</i>	
5:30 - 6:30 PM	Student Pitch Competition <i>(Hope A)</i>				
6:30 – 8:30 PM	Gala Dinner <i>(Hope Ballroom DE)</i>				



### Program Grid – Thursday, July 27<sup>th</sup>

Time: ET	Hope A	Hope B	Center Street A	Center Street B	Center Steet C
8:30 – 9:30 AM	Wurzite Ferroelectrics: Electrodes & Measurements	Hafnia	Lead-Free 5	Domains 3	Energy Storage 2
9:30 – 10:00 AM	Coffee Break (Superior Ballroom AB)				
10:00 – 12: 00 PM	PiezoMEMS Materials & Devices	PFM 5	Piezo 3	Unusual & Novel Properties	Thin Film Multiferroics, Domains, & Antiferroelectrics
12:00 – 1:00 PM	Lunch (Hope Ballroom E)				
1:00 – 2:30 PM	UFFC Distinguished Speaker / Closing Ceremony (Superior Ballroom DC)				

35 Years of Radiant Technologies

# JOIN THE CELEBRATION & WIN AN RT66C MATERIALS TESTER IN OUR GIVEAWAY!



**RADIANT IS CELEBRATING ITS 35<sup>TH</sup> ANNIVERSARY!**

Since our founding in 1988, Radiant Technologies has remained dedicated to delivering cutting-edge solutions in the field of materials testing.

Today, we are proud to be the leading provider of advanced materials testing equipment, catering to a diverse range of industries and applications.

To mark this momentous occasion, we are thrilled to announce a special giveaway of our materials tester, the RT66C. This remarkable instrument represents the embodiment of our company's heritage, paying tribute to the very first ferroelectric materials tester invented by Radiant in 1988, the RT66A. The RT66C serves as a testament to our commitment to innovation and our enduring passion for excellence. **The giveaway will begin on our anniversary date, June 3rd, and continue until mid-August.** We invite you to participate in this celebration of our journey by acquiring entries through various social media actions on [gleam.io](https://gleam.io) (this link will be at the end of the article).

It is our way of expressing our gratitude for your unwavering support throughout the years.

We are immensely grateful for the individuals who have played a pivotal role in our success. Our incredible team members, customers, partners, and community have been instrumental in shaping Radiant Technologies into the thriving organization it is today.

With your unwavering support, we are confident that the next 35 years will be even more extraordinary. On behalf of the entire Radiant Technologies, Inc. team, we extend our deepest gratitude for being an integral part of our success!

**THANK YOU FOR 35 INCREDIBLE YEARS,  
AND HERE'S TO THE REMARKABLE JOURNEY AHEAD!**



2835B Pan American Fwy NE  
Albuquerque, New Mexico 87107  
Tel: (505) 842-8007 | Fax: (505) 842-0366  
[FerroDevices.com](https://FerroDevices.com) | [Radiant@ferrodevices.com](mailto:Radiant@ferrodevices.com)



[tinyurl.com/RadiantTechnologiesGiveAway](https://tinyurl.com/RadiantTechnologiesGiveAway)

## Technical Program – Sunday, July 23<sup>rd</sup>

### **Ferroelectrics: general introduction**

7/23/2023 9:00 AM - 7/23/2023 10:30 AM America/New York  
Center Street A

Yun Liu, The Australian National University

### **Theory and simulation of ferroelectric materials and related**

7/23/2023 9:00 AM - 7/23/2023 10:30 AM America/New York  
Center Street B

Silvia Picozzi, Consiglio Nazionale delle Ricerche, CNR-SPIN

### **Strain effects in ferroelectrics**

7/23/2023 9:00 AM - 7/23/2023 10:30 AM America/New York  
Center Street C

Satoshi Wada, University of Yamanashi

### **Sunday Morning Coffee Break**

7/23/2023 10:30 AM - 7/23/2023 11:00 AM America/New York  
Hope Ballroom A Foyer

### **Piezoelectric microelectromechanical systems (In-person ONLY)**

7/23/2023 11:00 AM - 7/23/2023 12:30 PM America/New York  
Center Street A

Susan E. Trolier-McKinstry, Pennsylvania State University, Materials Research Institute, United States

### **Energy band alignment and band gaps of (anti)ferroelectrics**

7/23/2023 11:00 AM - 7/23/2023 12:30 PM America/New York  
Center Street B

Andreas Klein, Technische Universität Darmstadt

### **Cold sintering of ferroelectric materials**

7/23/2023 11:00 AM - 7/23/2023 12:30 PM America/New York  
Center Street C

JP Maria, Penn State University

## Technical Program – Sunday, July 23<sup>rd</sup>

### **Sunday Lunch**

7/23/2023 12:30 PM - 7/23/2023 2:00 PM America/New York  
Superior A

### **Neuromorphic computing using ferroelectric based devices**

7/23/2023 2:00 PM - 7/23/2023 3:30 PM America/New York  
Center Street A

Laura Begon-Lours, Zurich Research Laboratory

### **Memory Applications of Ferroelectric Materials**

7/23/2023 2:00 PM - 7/23/2023 3:30 PM America/New York  
Center Street B

Tony Schenk, Ferroelectric Memory GmbH (FMC)

### **Piezoresponse Force Microscopy: electromechanics at the nanoscale**

7/23/2023 2:00 PM - 7/23/2023 3:30 PM America/New York  
Center Street C

Neus Domingo, Oak Ridge National Laboratory

### **Sunday Afternoon Coffee Break**

7/23/2023 3:30 PM - 7/23/2023 4:00 PM America/New York  
Hope Ballroom A Foyer

### **Photoinduced effects in ferroelectric**

7/23/2023 4:00 PM - 7/23/2023 5:30 PM America/New York  
Center Street A

Sylvia Matzen, C2N, Universite Paris-Saclay

### **Electric Characterization of Ferroelectric Films**

7/23/2023 4:00 PM - 7/23/2023 5:30 PM America/New York  
Center Street C

Ignasi Fina Martínez, Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)

### **Student Social**

7/23/2023 6:30 PM - 7/23/2023 9:30 PM America/New York  
Punch Bowl Social Cleveland

## Technical Program – Monday, July 24<sup>th</sup>

### Opening Session & Plenary: Prof. Dr. Hong Wang

7/24/2023 8:30 AM - 7/24/2023 10:00 AM America/New York

Superior Ballroom DC

*Julia Glaum, Norwegian University of Science and Technology*

### 4369: High-Performance Dielectrics for Passive Integration and Energy Storage

Prof. Dr. Hong Wang, Southern University of Science and Technology, China

### Monday Morning Coffee Break

7/24/2023 10:00 AM - 7/24/2023 10:30 AM America/New York

Superior Ballroom AB

### Novel Optical Responses in Ferroelectrics

7/24/2023 10:30 AM - 7/24/2023 12:30 PM America/New York

Center Street A

*Geoffrey Brenneka, Colorado School of Mines*

10:30 AM

### 4058: Photo-Dielectric Effects in Aluminates (Invited)

Hiroki Taniguchi

Nagoya University, Japan

11:00 AM

### 4175: Achieving Ultra-High Bulk Photovoltaic Effect Responsivity in Thin Films: Teaching an Old Dog New Tricks

Ilya Grinberg<sup>{1}</sup>, Jonathan Spanier<sup>{2}</sup>, Lane W. Martin<sup>{3}</sup>

<sup>{1}</sup>Bar-Ilan University, Israel; <sup>{2}</sup>Drexel University, United States; <sup>{3}</sup>University of California, Berkeley, Lawrence Berkeley National Laboratory, United States

11:15 AM

### 4167: Dynamic and Reversible Photostriction of Co-Doped BaTiO<sub>3</sub> Thin Films Reaching 10<sup>-2</sup> Strain Under Visible Light

Gaëlle Vitali-Derrien<sup>{2}</sup>, Thomas Antoni<sup>{4}</sup>, Houssny Bouyanfif<sup>{1}</sup>, Mouna Khiari<sup>{1}</sup>, Thomas Maroutian<sup>{3}</sup>, Sylvia Matzen<sup>{3}</sup>, Pierre-Eymeric Janolin<sup>{2}</sup>, Charles Paillard<sup>{5}</sup>

<sup>{1}</sup>Université de Picardie Jules Verne, Laboratoire de physique de la matière condensée UR2081, France; <sup>{2}</sup>Université Paris-Saclay, CentraleSupélec, SPMS, UMR CNRS 8580, France; <sup>{3}</sup>Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, France; <sup>{4}</sup>Université Paris-Saclay, ENS Paris-Saclay, CNRS, LuMIn, France; <sup>{5}</sup>University of Arkansas, United States



## Technical Program – Monday, July 24<sup>th</sup>

11:30 AM

### 4181: **Rare-Earth Doped Ferroelectrics Towards Optical Temperature Sensing**

Jingye Zou<sup>{1}</sup>, Shenglan Hao<sup>{1}</sup>, Pascale Gemeiner<sup>{3}</sup>, Nicolas Guiblin<sup>{3}</sup>, Charles Paillard<sup>{2}</sup>,  
Brahim Dkhil<sup>{3}</sup>

<sup>{1}</sup>Université Paris-Saclay, France; <sup>{2}</sup>Université Paris-Saclay, CentraleSupélec, France;  
<sup>{3}</sup>Université Paris-Saclay, CentraleSupélec, SPMS, UMR CNRS 8580, France

11:45 AM

### 4094: **Visible-Light-Active Ferroelectrics for Photovoltaic Applications (Young Investigator)**

Hiroki Matsuo, Yuji Noguchi

Kumamoto University, Japan

#### Domains 1

7/24/2023 10:30 AM - 7/24/2023 11:45 AM America/New York

Center Street B

*Yuri Genenko, TU Darmstadt*

10:30 AM

### 4303: **Complex and Topological Domain Textures in Epitaxial Ferroelectric BiFeO<sub>3</sub> Thin Films and Superlattices (Invited)**

Daniel Sando

University of Canterbury, New Zealand

11:00 AM

### 4062: **Switching Ferroelectric Polarization with an Infrared Laser Pulse**

Maarten Kwaaitaal, Daniel Lourens, Carl Davies, Andrei Kirilyuk

Radboud University, Netherlands

11:15 AM

### 4063: **Visualization of Ferroaxial Domains Using Circularly Polarized Second Harmonic Generation Microscopy**

Hiroko Yokota<sup>{1}</sup>, Takeshi Hayashida<sup>{2}</sup>, Dan Kitahara<sup>{1}</sup>, Tsuyoshi Kimura<sup>{2}</sup>

<sup>{1}</sup>Chiba University, Japan; <sup>{2}</sup>University of Tokyo, Japan

11:30 AM

### 4174: **Multilevel Analytical Theory for Prediction of Ferroelectric Perovskite Oxide Properties from Composition**

Ilya Grinberg, Suhas Yadav, Atanu Samanta, Or Shafir

Bar-Ilan University, Israel



## Technical Program – Monday, July 24<sup>th</sup>

### PFM 1

7/24/2023 10:30 AM - 7/24/2023 12:00 PM America/New York

Center Street C

*Raymond McQuaid, Queen's University Belfast*

10:30 AM

#### 4398: **Spatially-Resolved Study of the Electronic Transport and Resistive Switching in Polycrystalline Bismuth Ferrite (Young Investigator)**

Denis Alikin<sup>{1}</sup>, Alexander Abramov<sup>{2}</sup>, Boris Slautin<sup>{2}</sup>, Andrei Kholkin<sup>{1}</sup>

<sup>{1}</sup>Universidade de Aveiro, Portugal; <sup>{2}</sup>Ural Federal University, Russia

11:00 AM

#### 4254: **Ferroelectric Switching Event Statistics Affected by Point and Extended Defect Interplay**

Ralph Bulanadi<sup>{3}</sup>, Kumara Cordero-Edwards<sup>{3}</sup>, Philippe Tückmantel<sup>{3}</sup>, Sahar Saremi<sup>{1}</sup>, Giacomo Morpurgo<sup>{3}</sup>, Qi Zhang<sup>{4}</sup>, Lane W. Martin<sup>{2}</sup>, Valanoor Nagarajan<sup>{4}</sup>, Patrycja Paruch<sup>{3}</sup>

<sup>{1}</sup>University of California, Berkeley, United States; <sup>{2}</sup>University of California, Berkeley, Lawrence Berkeley National Laboratory, United States; <sup>{3}</sup>University of Geneva, Switzerland; <sup>{4}</sup>University of New South Wales, Australia

11:15 AM

#### 4158: **Unveiling Conduction Pathways Through Functional Tomographic AFM**

Niyorjyoti Sharma<sup>{2}</sup>, Conor J. McCluskey<sup>{2}</sup>, Jesi R. Maguire<sup>{2}</sup>, Jiali He<sup>{1}</sup>, Dennis Meier<sup>{1}</sup>, J. Marty Gregg<sup>{2}</sup>, Raymond G.P. McQuaid<sup>{2}</sup>, Amit Kumar<sup>{2}</sup>

<sup>{1}</sup>Norwegian University of Science and Technology, Norway; <sup>{2}</sup>Queen's University of Belfast, United Kingdom

### **Strain Effects on Hafnia Phase Stability**

7/24/2023 10:30 AM - 7/24/2023 12:15 PM America/New York

Hope A

*Ruben Alcalá, NaMLab gGmbH*

10:30 AM

#### 4397: **Strain-Induced Two-Step Phase Transition and Polar-Antipolar Mode Coupling Stabilize Robust Ferroelectricity in Thin-Film Hafnia (Invited)**

Songsong Zhou, Jiahao Zhang, Andrew Rappe

University of Pennsylvania, United States

11:00 AM

#### 4123: **Quantification of Stress During Field Cycling of Hafnium Zirconium Oxide Thin Films**

Samantha Jaszewski, Shelby Fields, Jon Ihlefeld

University of Virginia, United States

## Technical Program – Monday, July 24<sup>th</sup>

11: 15 AM

### 4355: **Engineering the electro-Optic Effect in HfO<sub>2</sub> and ZrO<sub>2</sub> Through Strain and Polarization Control**

Francesco Delodovici<sup>{1}</sup>, Ran Xu<sup>{1}</sup>, Pierre-Eymeric Janolin<sup>{2}</sup>, Charles Paillard<sup>{1}</sup>, Cassidy Atkinson<sup>{3}</sup>, S.Pamir Alpay<sup>{3}</sup>

<sup>{1}</sup>Université Paris-Saclay, CentraleSupélec, France; <sup>{2}</sup>Université Paris-Saclay, CentraleSupélec, SPMS, UMR CNRS 8580, France; <sup>{3}</sup>University of Connecticut, Department of Materials Science and Engineering, United States

11:30 AM

### 4021: **Interface-Engineered Ferroelectricity of Epitaxial Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Thin Films**

Shu Shi<sup>{4}</sup>, Haolong Xi<sup>{7}</sup>, Tengfei Cao<sup>{5}</sup>, Weinan Lin<sup>{6}</sup>, Zhongran Liu<sup>{7}</sup>, Jiangzhen Niu<sup>{2}</sup>, Da Lan<sup>{4}</sup>, Chenghang Zhou<sup>{4}</sup>, Jing Cao<sup>{1}</sup>, Hanxin Su<sup>{4}</sup>, Tiejang Zhao<sup>{4}</sup>, Ping Yang<sup>{4}</sup>, Yao Zhu<sup>{3}</sup>, Xiaobing Yan<sup>{2}</sup>, Evgeny Tsymbal<sup>{5}</sup>, He Tian<sup>{7}</sup>, Jingsheng Chen

<sup>{1}</sup>Agency for Science, Technology and Research, Singapore; <sup>{2}</sup>Hebei University, China; <sup>{3}</sup>Institute of Microelectronics, Agency for Science, Technology and Research, Singapore; <sup>{4}</sup>National University of Singapore, Singapore; <sup>{5}</sup>University of Nebraska, United States; <sup>{6}</sup>Xiamen University, China; <sup>{7}</sup>Zhejiang University, China

11:45 AM

### 4033: **Toward Highly Pure Ferroelectric Hf<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub> Thin Films by Tailoring the Strain in an Unstable Thermodynamic System**

Yu-Cheng Kao<sup>{2}</sup>, Hao-Kai Peng<sup>{2}</sup>, Kuo-An Wu<sup>{2}</sup>, Yung-Hsien Wu<sup>{2}</sup>, Pin-Jiun Wu<sup>{1}</sup>

<sup>{1}</sup>National Synchrotron Radiation Research Center, Taiwan; <sup>{2}</sup>National Tsing Hua University, Taiwan

12:00 PM

### 4096: **Stress Effects on Ferroelectric Doped Epitaxial HfO<sub>2</sub> Oxide Films and its Impact on Functional Properties**

Ignasi Fina Martínez, Tingfeng Song, Huan Tan, Florencio Sánchez  
ICMAB-CSIC Institut de Ciència de Materials de Barcelona, Spain

## **Piezoelectric MEMS & NEMS 1**

7/24/2023 10:30 AM - 7/24/2023 12:00 PM America/New York

Hope B

*Runar Plünnecke Dahl-Hansen, SINTEF MiNaLab*

10:30 AM

### 4052: **Multiferroic Magnetolectrics: a Path Toward Novel Electronics with Ultra-Low SWaP-C (Invited)**

Nian Sun

Northeastern University, United States

## Technical Program – Monday, July 24<sup>th</sup>

11:00 AM

**4102: Ferroelectric AlScN-Based Programmable MEMS Mac Unit**

Shubham Jadhav, Ved Gund, Amit Lal  
Cornell University, United States

11:15 AM

**4171: Quantitative Piezoresponse Force Microscopy for Process Optimization of Scandium-Doped Aluminum Nitride in Acoustic Resonator RF Filters**

Benjamin Ohler, Ted Limpoco, Roger Proksch  
Oxford Instruments Asylum Research Inc, United States

11:30 AM

**4191: Demonstration of Acoustically Driven Ferromagnetic Resonance Using Leaky Surface Acoustic Waves in Lithium Tantalate**

Sidhant Tiwari, Amun Jarzembki, Aleem Siddiqui, Robert Reyna, Robynne Paldi, Darren Branch  
Sandia National Laboratories, United States

11:45 AM

**4153: Piezoelectric Properties of Epitaxial PZT Thin Films on Si Substrates (Invited)**

Isaku Kanno<sup>{1}</sup>, Sang Hyo Kweon<sup>{1}</sup>, Goon Tan<sup>{2}</sup>  
<sup>{1}</sup>Kobe University, Japan; <sup>{2}</sup>Osaka Metropolitan University, Japan

**Safe Zone Training for LGBTQ + allies Lunch**

7/24/2023 12:30 PM - 7/24/2023 2:00 PM America/New York  
Hope C

**Monday Lunch**

7/24/2023 12:30 PM - 7/24/2023 2:00 PM America/New York  
Hope Ballroom E

## Technical Program – Monday, July 24<sup>th</sup>

### Energy Harvesting

7/24/2023 2:00 PM - 7/24/2023 3:30 PM America/New York

Center Street A

*Mojca Otonicar, Jozef Stefan Institute*

2:00 PM

#### 4272: **Environmentally Friendly and Cost-Efficient Multisource Energy Harvesters Relying on Printable Ferroelectric Materials (Invited)**

Jonas Groten<sup>{2}</sup>, Oliver Werzer<sup>{2}</sup>, Krzysztof Krawczyk<sup>{2}</sup>, Philipp Schäffner<sup>{2}</sup>, Asier Alvarez<sup>{2}</sup>, Xin Wang<sup>{3}</sup>, C. Rusu<sup>{3}</sup>, Benedikt Schug<sup>{1}</sup>, Gerhard Domann<sup>{1}</sup>, Jürgen Clade<sup>{1}</sup>, Barbara Stadlober<sup>{2}</sup>

<sup>{1}</sup>Fraunhofer Institute for Photonic Microsystems Silicate Research ISC, Germany; <sup>{2}</sup>Joanneum Research Forschungsgesellschaft mbH, Austria; <sup>{3}</sup>RISE Research Institutes of Sweden, Sweden

2:30 PM

#### 4043: **Ferroelectric Materials and Their Phase Transitions for Energy Harvesting**

Gaspard Taxil<sup>{5}</sup>, Mickaël Lallart<sup>{3}</sup>, Gaël Sebald<sup>{2}</sup>, Benjamin Ducharne<sup>{4}</sup>, Tung Thanh Nguyen<sup>{1}</sup>, Takahito Ono<sup>{6}</sup>, Hiroki Kuwano<sup>{6}</sup>

<sup>{1}</sup>ELyTMaX CNRS, Japan; <sup>{2}</sup>ELyTMaX, CNRS, Université de Lyon, Tohoku University, INSA Lyon, Japan; <sup>{3}</sup>INSA Lyon, France; <sup>{4}</sup>INSA Lyon, CNRS, Tohoku University, ELyTMaX, France; <sup>{5}</sup>INSA Lyon, Tohoku University, France; <sup>{6}</sup>Tohoku University, Japan

2:45 PM

#### 4126: **Piezoelectric Energy Harvesting from a Direct Force Application: an Experimental Proof of Concept for Ultra-High Output Energy**

Gaël Sebald<sup>{2}</sup>, Nguyen Thanh Tung<sup>{1}</sup>, Gaspard Taxil<sup>{5}</sup>, Benjamin Ducharne<sup>{4}</sup>, Jhordan Chavez<sup>{7}</sup>, Takahito Ono<sup>{6}</sup>, Hiroki Kuwano<sup>{6}</sup>, Elie Lefeuvre<sup>{7}</sup>, Mickaël Lallart<sup>{3}</sup>

<sup>{1}</sup>CNRS, Tohoku University, Japan; <sup>{2}</sup>ELyTMaX, CNRS, Université de Lyon, Tohoku University, INSA Lyon, Japan; <sup>{3}</sup>INSA Lyon, France; <sup>{4}</sup>INSA Lyon, CNRS, Tohoku University, ELyTMaX, Japan; <sup>{5}</sup>INSA Lyon, Tohoku University, France; <sup>{6}</sup>Tohoku University, Japan; <sup>{7}</sup>Université Paris-Saclay, France

3:00 PM

#### 4070: **Processing-Microstructure-Properties Relations in Screen-Printed Potassium Sodium Niobate-Based Thick Films on Platinized Alumina Substrates**

Brigita Kmet, Hana Uršič, Andreja Benčan, Barbara Malič  
Jožef Stefan Institute, Slovenia

## Technical Program – Monday, July 24<sup>th</sup>

3:15 PM

### 4261: **More Than 10 Joules Harvested with Pyroelectric Modules**

Youri Nouchokgwe<sup>{1}</sup>, Pierre Lheritier<sup>{1}</sup>, Alvar Torello<sup>{1}</sup>, Tomoyasu Usui<sup>{4}</sup>, Ashwath Aravindhan<sup>{1}</sup>, Junning Li<sup>{1}</sup>, Uros Prah<sup>{1}</sup>, Veronika Kovacova<sup>{2}</sup>, Olivier Bouton<sup>{1}</sup>, Sakyo Hirose<sup>{3}</sup>, Emmanuel Defay<sup>{2}</sup>

<sup>{1}</sup>Luxembourg Institute of Science and Technology, Luxembourg; <sup>{2}</sup>Luxembourg Institute of Science and Technology, MRT, FMT, Luxembourg; <sup>{3}</sup>Murata Manufacturing Co., Ltd., Luxembourg; <sup>{4}</sup>University of Luxembourg, Luxembourg

### **Domains 2**

7/24/2023 2:00 PM - 7/24/2023 3:30 PM America/New York

Center Street B

*Hiroki Yokota, Chiba University*

2:00 PM

### 4129: **Domain Size Effect on Piezoelectricity of Ferroelectric Crystals (Invited)**

Bo Wang<sup>{1}</sup>, Fei Li<sup>{2}</sup>, Long-Qing Chen<sup>{1}</sup>

<sup>{1}</sup>Pennsylvania State University, Materials Research Institute, United States; <sup>{2}</sup>Xi'an Jiaotong University, China

2:30 PM

### 4045: **The Effect of Stochastic Depolarization Fields on Domain Formation Kinetics in Ferroelectrics**

Yuri Genenko<sup>{2}</sup>, Olga Mazur<sup>{1}</sup>, Leonid Stefanovich<sup>{1}</sup>

<sup>{1}</sup>M.S. Poliakov Institute of Geotechnical Mechanics of the National Academy of Ukraine, Ukraine; <sup>{2}</sup>Technical University of Darmstadt, Germany

2:45 PM

### 4227: **From Skyrmions to Anti-Skyrmions in Ferroelectric Perovskites (Young Investigator)**

Mauro Antonio Pereira Gonçalves

Fyzikální ústav AV ČR, v. v. i., Institute of Physics of the Czech Academy of Sciences, Czech Rep.

3:15 PM

### 4394: **Skyrmion-Like Polar Nanodomains with Conductive Domain Wall in SrTiO<sub>3</sub>/PbTiO<sub>3</sub> Heterostructures**

Hongying Chen, Peijie Jiao, Di Wu

Nanjing University, China

## Technical Program – Monday, July 24<sup>th</sup>

### PFM 2

7/24/2023 2:00 PM - 7/24/2023 3:15 PM America/New York

Center Street C

Yonatan Calahorra, Technion - IIT

2:00 PM

#### 4085: **Highly Enhanced Ferroelectricity in HfO<sub>2</sub>-Based Thin Films via Oxygen Vacancy Engineering (Invited)**

Yunseok Kim

Sungkyunkwan University, Korea

2:30 PM

#### 4060: **Probing the Behaviour of Surface Water on Ferroelectric PbTiO<sub>3</sub> Thin Films As a Function of Relative Humidity and Temperature**

Loïc Musy, Céline Lichtensteiger, Christian Weymann, Iaroslav Gaponenko, Patrycja Paruch  
University of Geneva, Switzerland

2:45 PM

#### 4078: **Research on Correlation Between Grain Boundaries and Ferroelectric Switching Behaviors Through Statistical Analysis of Local C-V Map Datasets**

Yoshiomi Hiranaga<sup>{2}</sup>, Yuki Noguchi<sup>{2}</sup>, Takanori Mimura<sup>{3}</sup>, Takao Shimizu<sup>{1}</sup>, Hiroshi Funakubo<sup>{3}</sup>,  
Yasuo Cho<sup>{2}</sup>

<sup>{1}</sup>National Institute for Materials Science NIMS, Tokyo Institute of Technology, Japan; <sup>{2}</sup>Tohoku University, Japan; <sup>{3}</sup>Tokyo Institute of Technology, Japan

3:00 PM

#### 4402: **Strain-Driven Mixed-Phase Domain Architectures and Topological Transitions in Pb<sub>1-x</sub>Sr<sub>x</sub>TiO<sub>3</sub> Thin Films**

Pravin Kavle<sup>{2}</sup>, Jacob A. Zorn<sup>{1}</sup>, Arvind Dasgupta<sup>{2}</sup>, Bo Wang<sup>{1}</sup>, Maya Ramesh<sup>{2}</sup>, Long-Qing Chen<sup>{1}</sup>, Lane W. Martin<sup>{2}</sup>

<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>University of California at Berkeley, United States

### Hafnia Reliability & Performance

7/24/2023 2:00 PM - 7/24/2023 3:15 PM America/New York

Hope A

Sean Smith, Radiant Technologies Inc.

2:00 PM

#### 4120: **Impact of Duty Cycle on the Endurance of Hafnium Zirconium Oxide Thin Film Capacitors**

Megan Lenox, Samantha Jaszewski, Shelby Fields, Nikhil Shukla, Jon Ihlefeld  
University of Virginia, United States



## Technical Program – Monday, July 24<sup>th</sup>

2:15 PM

### 4079: **Insights Into the Electrical Stress Response and Endurance of Ferroelectric Hafnium Zirconium Oxide Thin Films**

Antik Mallick<sup>{2}</sup>, Megan Lenox<sup>{2}</sup>, Thomas Beechem<sup>{1}</sup>, Jon Ihlefeld<sup>{2}</sup>, Nikhil Shukla<sup>{2}</sup>  
{1}Purdue University, United States; {2}University of Virginia, United States

2:30 PM

### 4282: **Study of Imprint Dynamics in HZO Ferroelectric Capacitors**

Benoît Manchon<sup>{3}</sup>, Greta Segantini<sup>{1}</sup>, Pedro Rojo Romeo<sup>{2}</sup>, Ingrid Cañero Infante<sup>{4}</sup>, Dominique Drouin<sup>{5}</sup>, Bertrand Vilquin<sup>{2}</sup>, Damien Deleruyelle<sup>{4}</sup>  
{1}École Centrale de Lyon, France; {2}École Centrale de Lyon, CNRS, INSA Lyon, Université Claude Bernard Lyon 1, CPE Lyon, CNRS, INL, France; {3}INSA Lyon, France; {4}INSA Lyon, CNRS, Ecole Centrale de Lyon, Université Claude Bernard Lyon 1, CPE Lyon, INL, France; {5}Université de Sherbrooke, Canada

2:45 PM

### 4308: **Piezoelectricity in Doped Hf<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub> from Ab Initio**

Richard Ganser, Luis Azevedo Antunes, Alfred Kersch  
Munich University of Applied Sciences, Germany

3:00 PM

### 4295: **Electronic Properties of A<sub>6</sub>B<sub>2</sub>O<sub>17</sub> (a = Zr, Hf; B = Nb, Ta) Disordered Oxides**

Jackson Spurling<sup>{1}</sup>, Chloe Skidmore<sup>{1}</sup>, Jon-Paul Maria<sup>{2}</sup>  
{1}Pennsylvania State University, United States; {2}Pennsylvania State University, Materials Research Institute, United States

### **Lead-Free 1**

7/24/2023 2:00 PM - 7/24/2023 3:00 PM America/New York

Hope B

*Michelle Dolgos, University of Calgary*

2:00 PM

### 4319: **Defect Engineering Field-Induced Piezoelectric Strain**

Shujun Zhang<sup>{3}</sup>, Yiping Guo<sup>{1}</sup>, Jun Chen<sup>{2}</sup>  
{1}Shanghai Jiao Tong University, China; {2}University of Science and Technology Beijing, China; {3}University of Wollongong, ISEM, AIIIM, Australia

2:15 PM

### 4323: **DC Bias Characteristics of Nano-Grain BaTiO<sub>3</sub> Based Ceramics**

Takashi Teranishi, Ruku Ozaki, Mizuki Katsura, Shinya Kondo, Akira Kishimoto  
Okayama University, Japan

## Technical Program – Monday, July 24<sup>th</sup>

2:30 PM

### 4234: **Characterization of Phase and Domain Switching in Sn-Doped BCZT Piezoceramics with Coexisting Ferroelectric Phases**

Abhijit Pramanick<sup>{3}</sup>, Laurent Daniel<sup>{4}</sup>, Sarangi Venkateshwarlu<sup>{1}</sup>, Valentin Segouin<sup>{3}</sup>, Yang Ren<sup>{2}</sup>

<sup>{1}</sup>City University of Hong Kong, Hong Kong; <sup>{2}</sup>City University of Hong Kong, Argonne National Laboratory, Hong Kong; <sup>{3}</sup>Université Paris-Saclay, CentraleSupélec, CNRS, Sorbonne Université, France; <sup>{4}</sup>Université Paris-Saclay, CentraleSupélec, GeePs, CNRS, Sorbonne Université, France

### **Monday Afternoon Coffee Break**

7/24/2023 3:30 PM - 7/24/2023 4:00 PM America/New York

Superior Ballroom AB

### **Monday Posters**

7/24/2023 4:00 PM - 7/24/2023 5:30 PM America/New York

Superior Ballroom AB

*Brendan Hanrahan, U.S. Army Research Laboratory*

### 4002: **Hard-to-Soft Transition-Enhanced Piezoelectricity in Poly(Vinylidene Fluoride) via Relaxor-Like Secondary Crystals Activated by High-Power Ultrasonication**

Guanchun Rui, Qin Zou, Elshad Allahyarov, Philip Taylor, Lei Zhu

Case Western Reserve University, United States

### 4006: **Perovskite High Entropy Oxide Films**

Yeongwoo Son<sup>{1}</sup>, Susan Trolier-McKinstry<sup>{2}</sup>

<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>Pennsylvania State University, Materials Research Institute, United States

### 4007: **Modeling of Normal and Relaxor Ferroelectrics with Various DFT Exchange-Correlation Functionals**

Yenny Cardona Quintero, Richard Pérez-Moyet

Naval Undersea Warfare Center, United States

### 4008: **Anisotropy Free Energy Contribution of the Ferroelectric Domain Dynamics in PMN-PT and PIN-PMN-PT Relaxor Ferroelectrics**

Richard Pérez-Moyet, Yenny Cardona Quintero, Adam Heitmann

Naval Undersea Warfare Center, United States

## Technical Program – Monday, July 24<sup>th</sup>

### 4009: **Flexible Ultrasound-Induced Piezoelectric Energy Harvesting Device for Biomedical Application**

Yushun Zeng, Laiming Jiang, Qifa Zhou  
University of Southern California, United States

### 4014: **Analysis of Commercial Polymers for Developing Next-Generation Film Capacitors**

Michael Chen<sup>{1}</sup>, Grace Gilson<sup>{2}</sup>, Tianxiong Ju<sup>{1}</sup>, Lei Zhu<sup>{1}</sup>  
<sup>{1}</sup>Case Western Reserve University, United States; <sup>{2}</sup>Hathaway Brown School, United States

### 4015: **Improved Polarization by Interface Layer Insertion in Ferroelectric HfO<sub>2</sub>-Based MFM Capacitors**

Ayse Sünbül<sup>{1}</sup>, David Lehninger<sup>{1}</sup>, Maximilian Lederer<sup>{1}</sup>, Thomas Kämpfe<sup>{1}</sup>, Konrad Seidel<sup>{1}</sup>, Lukas M. Eng<sup>{2}</sup>  
<sup>{1}</sup>Fraunhofer Institute for Photonic Microsystems IPMS, CNT, Germany; <sup>{2}</sup>Technische Universität Dresden, Germany

### 4017: **Tailoring the Coercive Field of Ferroelectric HfO<sub>2</sub> – Towards Energy Efficient FeFETs and FeRAMs**

David Lehninger<sup>{2}</sup>, Ayse Sünbül<sup>{2}</sup>, Aditya Prabhu<sup>{1}</sup>, Maximilian Lederer<sup>{2}</sup>, Konrad Seidel<sup>{2}</sup>  
<sup>{1}</sup>Fraunhofer Institute for Photonic Microsystems IPMS, Germany; <sup>{2}</sup>Fraunhofer Institute for Photonic Microsystems IPMS, CNT, Germany

### 4054: **Phase Transitions of BaxSr<sub>1-x</sub>TiO<sub>3</sub> Characterized Using Temperature-Dependent Raman Spectroscopy**

Brian Hosterman, Taylor Guerra  
Colorado Mesa University, United States

### 4055: **The Impact of Aging on the Electrocaloric Effect in (Na<sub>0.5</sub>Bi<sub>0.5</sub>)TiO<sub>3</sub> - BaTiO<sub>3</sub> - Bi(Mg<sub>0.5</sub>Ti<sub>0.5</sub>)O<sub>3</sub> Perovskite Ceramics**

Sobhan Mohammadi Fathabad<sup>{2}</sup>, Vladimir Shvartsman<sup>{2}</sup>, Ekaterina Politova<sup>{1}</sup>, Galina Kaleva<sup>{1}</sup>, Doru Lupascu<sup>{2}</sup>  
<sup>{1}</sup>N.N. Semenov Institute of Chemical Physics of the Russian Academy of Sciences, Russia; <sup>{2}</sup>Universität Duisburg-Essen, Germany

### 4057: **Comparative Study of CdTe Bulk System Co-Doped with Two Different Transition Metal Atoms Using Different Exchange-Corelation Energy Functionals: GGA, GGA+U and Hybrid Functional**

Sutapa Chattopadhyay, Anjali Kshirsagar  
Savitribai Phule Pune University, India

## Technical Program – Monday, July 24<sup>th</sup>

### 4061: **First Principles Calculations of Cu Doped Bulk and Monolayer ZnO: a Potential Spintronic Material**

Ashwini Mali, Anjali Kshirsagar  
Savitribai Phule Pune University, India

### 4075: **Orientation Dependent Pyroelectric and Electrocaloric Effects in PbZr<sub>0.2</sub>Ti<sub>0.8</sub>O<sub>3</sub> Thin Films**

Ching-Che Lin<sup>{1}</sup>, Djamila Lou<sup>{1}</sup>, Jiyeob Kim<sup>{1}</sup>, Ashwath Bhat<sup>{1}</sup>, Chris Dames<sup>{1}</sup>, Lane W. Martin<sup>{2}</sup>  
<sup>{1}</sup>University of California, Berkeley, United States; <sup>{2}</sup>University of California, Berkeley, Lawrence Berkeley National Laboratory, United States

### 4077: **Damaged-Free Release Method via ZnO Sacrificial Layer for DRIE Backside Etching**

Pannawit Tipsawat<sup>{1}</sup>, Quyen Tran<sup>{1}</sup>, Xiaojun Zheng<sup>{1}</sup>, Thomas N. Jackson<sup>{1}</sup>, Susan Trolier-McKinstry<sup>{2}</sup>  
<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>Pennsylvania State University, Materials Research Institute, United States

### 4101: **Impedance-Loaded SAW Reflective Delay Lines for Monitoring Corrosion in Pipelines**

Jagannath Devkota<sup>{2}</sup>, David Greve<sup>{1}</sup>, Nathan Diemler<sup>{2}</sup>, Ruishu Wright<sup>{2}</sup>  
<sup>{1}</sup>Carnegie Mellon University, United States; <sup>{2}</sup>National Energy Technology Laboratory, Department of Energy, United States

### 4103: **Electrical Characteristics of Polar-Textured Wurtzite MgGeN<sub>2</sub> and MgSiN<sub>2</sub> Thin Films**

Nate Bernstein<sup>{1}</sup>, Amanda Loutris<sup>{1}</sup>, Ann Greenaway<sup>{3}</sup>, Prashun Gorai<sup>{1}</sup>, Andriy Zakutayev<sup>{3}</sup>, Keisuke Yazawa<sup>{2}</sup>, Geoff L. Brennecke<sup>{1}</sup>  
<sup>{1}</sup>Colorado School of Mines, United States; <sup>{2}</sup>Colorado School of Mines, Materials Science Center, National Renewable Energy Laboratory, United States; <sup>{3}</sup>Materials Science Center, National Renewable Energy Laboratory, United States

### 4104: **Electrode Composition Effects on Retention Characteristics of Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Capacitors**

Benjamin Aronson<sup>{3}</sup>, Megan Lenox<sup>{3}</sup>, Samantha Jaszewski<sup>{3}</sup>, Leonard Jacques<sup>{1}</sup>, Susan Trolier-McKinstry<sup>{2}</sup>, Jon Ihlefeld<sup>{3}</sup>  
<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>Pennsylvania State University, Materials Research Institute, United States; <sup>{3}</sup>University of Virginia, United States

### 4109: **Broadband Dielectric Properties of Re-Entrant Relaxor Nb-Doped BiFeO<sub>3</sub>-BaTiO<sub>3</sub> Ceramics**

Vadzim Haronin<sup>{2}</sup>, Robertas Grigalaitis<sup>{2}</sup>, Jūras Banys<sup>{2}</sup>, Ziqi Yang<sup>{1}</sup>, Yizhe Li<sup>{1}</sup>, David Hall<sup>{1}</sup>  
<sup>{1}</sup>University of Manchester, United Kingdom; <sup>{2}</sup>Vilnius University, Lithuania

## Technical Program – Monday, July 24<sup>th</sup>

### 4113: **Systematic Study on Acid-Base Reactions of Dion-Jacobson Phases**

Benjamin Hirt, Alp Sehirlioglu  
Case Western Reserve University, United States

### 4114: **Broadband Dielectric Spectra of Mixed Hybrid Halide Perovskites**

Robertas Grigalaitis<sup>{2}</sup>, Sergejus Balčiūnas<sup>{2}</sup>, Mantas Šimėnas<sup>{2}</sup>, Šarūnas Svirskas<sup>{2}</sup>, Jūras Banys<sup>{2}</sup>, Miroslaw Maczka<sup>{1}</sup>  
<sup>{1}</sup>Trzebiatowski Institute of Low Temperature and Structure Research of the Polish Academy of Sciences, Poland; <sup>{2}</sup>Vilnius University, Lithuania

### 4117: **Point Defects and Conduction Mechanisms in 0.67BiFeO<sub>3</sub>-0.33BaTiO<sub>3</sub> Ceramics Prepared by Mechanochemical Activation**

Antonio Iacomini, Maja Koblar, Tadej Rojac  
Jožef Stefan Institute, Slovenia

### 4119: **Impact of Oxygen During Reactive RF Sputtered Deposition on HZO Thin Film Phase Assemblage**

Megan Lenox, Samantha Jaszewski, Jon Ihlefeld  
University of Virginia, United States

### 4121: **Piezoelectric Sensors for Flexible Electronic Stress Monitoring**

Kathleen Coleman, Sean Heintzelman, Harvey Tsang, Brendan Hanrahan, Wayne Churaman  
DEVCOM Army Research Laboratory, United States

### 4122: **Investigations of Magneto-Electric Coupling Through Direct and Indirect methods in Eco-Friendly Ferroelectric-Ferrite Magnetolectric Composite**

Munendra Pal<sup>{3}</sup>, Adiraj Srinivas<sup>{1}</sup>, Saket Asthana<sup>{3}</sup>, Deepa Xavier<sup>{2}</sup>, Venkatachalam Subramanian<sup>{2}</sup>  
<sup>{1}</sup>Defence Metallurgical Research Laboratory, Defence Research and Development Organisation, India; <sup>{2}</sup>Indian Institute of Technology Madras, India; <sup>{3}</sup>Indian Institute of Technology, Hyderabad, India

### 4127: **Origin of Fatigue Phenomenon in Aluminum Scandium Nitride**

Kyung Do Kim, Yong Bin Lee, Suk Hyun Lee, In Soo Lee, Seung Kyu Ryoo, Seung Yong Byun, Jae Hoon Lee, Hani Kim, Hyeon Woo Park, Cheol Seong Hwang  
Seoul National University, Korea

### 4128: **Unveiling the Impact of Elevated Temperature Annealing on AlScN Films Under Nitrogen and Ammonia Ambient Conditions**

Seung Kyu Ryoo, Kyung Do Kim, Cheol Seong Hwang  
Seoul National University, Korea

## Technical Program – Monday, July 24<sup>th</sup>

### 4135: **Batio<sub>3</sub>/PDMS Composites As High-Frequency Nanogenerators: Dielectric, Ultrasonic, and Piezoelectric Properties**

Darya Meisak<sup>{3}</sup>, Artyom Plyushch<sup>{3}</sup>, Jan Macutkevic<sup>{3}</sup>, Martynas Kinka<sup>{3}</sup>, Sébastien Schaefer<sup>{1}</sup>, Vytautas Samulionis<sup>{3}</sup>, Aleksej Zarkov<sup>{3}</sup>, Polina Kuzhir<sup>{2}</sup>, Alain Celzard<sup>{1}</sup>, Jūras Banys<sup>{3}</sup>  
<sup>{1}</sup>Université de Lorraine, France; <sup>{2}</sup>University of Eastern Finland, Finland; <sup>{3}</sup>Vilnius University, Lithuania

### 4138: **Preparation of Electrocaloric Epitaxial Layer Architectures for Freestanding Oxide Membranes**

Jonas Wawra, Robin Adlung, Kornelius Nielsch, Ruben Hühne  
Leibniz IFW Dresden, Technische Universität Dresden, Germany

### 4142: **Advancing Solid State Reaction Science Through in Situ X-Ray Diffraction and Processing Control**

Andre Hillsman, Leah Bellcase, Jennifer Forrester, Jacob Jones  
North Carolina State University, United States

### 4143: **Crowdsourced Materials Data Engine for Unpublished X-Ray Diffraction**

Abhishek Daundkar, Mengying Wang, Hanchao Ma, Yiyang Bian, Alp Sehirlioglu, Yinghui Wu  
Case Western Reserve University, United States

### 4157: **Visualization of Polarization Fatigue in Piezoelectric Energy Harvester Using Piezoresponse Force Microscopy**

Seongmun Eom, Jeongjae Ryu, Seongwoo Cho, Jiwon Yeom, Seungbum Hong  
Korea Advanced Institute of Science and Technology, Korea

### 4159: **Free-Standing Functional Oxide Membrane Through Remote Epitaxy**

Asraful Haque<sup>{1}</sup>, Suman Kumar Mandal<sup>{1}</sup>, Shankar Kumar Selvaraja<sup>{1}</sup>, Pavan Nukala<sup>{2}</sup>, Srinivasan Raghavan<sup>{2}</sup>  
<sup>{1}</sup>Center for Nanoscience Engineering, Indian Institute of Science, India; <sup>{2}</sup>Indian Institute of Science, Center for Nanoscience Engineering, India

### 4161: **The Atomic Layer Deposited 5nm Ferroelectric/Antiferroelectric Hafnium Zirconium Oxide Using Heteroleptic Hf/Zr Precursor**

Seongjae Shin, Seung Yong Byun, Hani Kim, Cheol Seong Hwang  
Seoul National University, Korea



## Technical Program – Monday, July 24<sup>th</sup>

### 4166: **An Antipolar-Driven Ferroelectric: Phase Transition of Cu-CI Boracite**

Charlotte Cochard<sup>{6}</sup>, Torsten Granzow<sup>{3}</sup>, Carmen Fernandez-Posada<sup>{5}</sup>, Michael Carpenter<sup>{5}</sup>, Roger Whatmore<sup>{2}</sup>, J. Marty Gregg<sup>{4}</sup>, Peter Nockemann<sup>{4}</sup>, Mael Guennou<sup>{7}</sup>, Michael Josse<sup>{1}</sup>  
<sup>{1}</sup>ICMBCB, UMR5026, CNRS, Université de Bordeaux, Bordeaux INP, France; <sup>{2}</sup>Imperial College London, United Kingdom; <sup>{3}</sup>Luxembourg Institute of Science and Technology, MRT, FMT, Luxembourg; <sup>{4}</sup>Queen's University of Belfast, United Kingdom; <sup>{5}</sup>University of Cambridge, United Kingdom; <sup>{6}</sup>University of Dundee, United Kingdom; <sup>{7}</sup>University of Luxembourg, Luxembourg

### 4168: **Solid-State Synthesis of Boracites**

Alice Barkley<sup>{2}</sup>, Laszlo Csetenyi<sup>{2}</sup>, Michael Josse<sup>{1}</sup>, Charlotte Cochard<sup>{2}</sup>  
<sup>{1}</sup>ICMBCB, UMR5026, CNRS, Université de Bordeaux, Bordeaux INP, France; <sup>{2}</sup>University of Dundee, United Kingdom

### 4173: **Effective Moisture Protection for Bulk and Thin Film Piezoelectric Actuators**

Anthony Diaz-Huemme, Susan Trolier-McKinstry  
Pennsylvania State University, Materials Research Institute, United States

### 4184: **Theoretical Calculation of Raman Spectra for Large Systems from Atomistic Molecular Dynamics Simulations**

Ilya Grinberg, Atanu Paul  
Bar-Ilan University, Israel

### 4185: **Lead-Free Piezoceramic Materials for Transducer Applications**

William Schulz, Andrew J. Bell  
University of Leeds, United Kingdom

### 4190: **Uncovering the Origin of Piezoelectric Response in BFTM-PT**

Brooke Richtik<sup>{2}</sup>, Thomas Rowe<sup>{2}</sup>, Jacob Jones<sup>{1}</sup>, Michelle Dolgos<sup>{2}</sup>  
<sup>{1}</sup>North Carolina State University, United States; <sup>{2}</sup>University of Calgary, Canada

### 4207: **Combined Ferroelectric and Negative Differential Resistance Film Stacks for Oscillatory Neural Networks**

Ruben Hamming-Green<sup>{1}</sup>, Marcel van Den Broek<sup>{1}</sup>, Ewout van der Veer<sup>{1}</sup>, Beatriz Noheda<sup>{2}</sup>  
<sup>{1}</sup>University of Groningen, Netherlands; <sup>{2}</sup>University of Groningen, Zernike Institute for Advanced Materials, Netherlands

### 4221: **Stabilization of Antiferroelectric Phase in K<sub>2</sub>NdNb<sub>5</sub>O<sub>15</sub> at Room Temperature by Ta Substitution**

Hodaka Abe, Yasuhara Sou, Takaaki Tsurumi, Takuya Hoshina  
Tokyo Institute of Technology, Japan

## Technical Program – Monday, July 24<sup>th</sup>

2040: **Pulsed Laser Deposition (PLD) In-Situ Neutron And X-Ray Investigations. Lab-Scale PLD In-Situ ARPES, XRD, XRR On Liquid Jet X-Ray Source**

*Svetlana Antipina & Aleksandr Goikhman, KönigsSystems*

### **Welcome Reception**

7/24/2023 6:00 PM - 7/24/2023 8:30 PM America/New York

The Arcade Cleveland

## Technical Program – Tuesday, July 25<sup>th</sup>

### Plenary: Dr. Thomas Mikolajick

7/25/2023 8:30 AM - 7/25/2023 9:30 AM America/New York

Superior Ballroom DC

*Sandwip Dey, Arizona State University*

### 4399: Enhanced Functionality of Semiconductor Devices Enabled by Ferroelectricity in Hafnium Oxide

Thomas Mikolajick

NaMLab gmbH, Technische Universität Dresden, Germany

### Tuesday Morning Coffee Break

7/25/2023 9:30 AM - 7/25/2023 10:00 AM America/New York

Superior Ballroom AB

### Energy Storage 1

7/25/2023 10:00 AM - 7/25/2023 12:00 PM America/New York

Center Street A

*Aiping Chen, Los Alamos National Laboratory*

10:00 AM

### 4148: Low Temperature Sintered Lead-Free Ceramics for Energy Storage Applications

Jincymol Joseph<sup>{1}</sup>, Zhenxiang Cheng<sup>{2}</sup>, Shujun Zhang<sup>{2}</sup>

<sup>{1}</sup>Australian Institute of Innovative Materials, Australia; <sup>{2}</sup>University of Wollongong, ISEM, AIIM, Australia

10:15 AM

### 4016: Rapid Discovery of Superior Energy Storage Performance in Lead-Free Ferroelectric Films with Slush Polar States via Machine Learning

Aiping Chen

Los Alamos National Laboratory, United States

10:30 AM

### 4360: Giant and Temperature-Insensitive Strain and Energy-Storage Density in Fine PbHfO<sub>3</sub>

Zenghui Liu<sup>{2}</sup>, Hongyan Wan<sup>{2}</sup>, Jingrui Li<sup>{2}</sup>, Wei Ren<sup>{2}</sup>, Zuo-Guang Ye<sup>{1}</sup>

<sup>{1}</sup>Simon Fraser University, Canada; <sup>{2}</sup>Xi'an Jiaotong University, China

10:45 AM

### 4092: Enhanced Energy Storage Properties in Bi<sub>0.5</sub>Na<sub>0.5</sub>TiO<sub>3</sub>-Based Thin Films from Chemical Solution Deposition

Herbert Kobald, Alexander Kobald, Marco Deluca

Materials Center Leoben Forschung GmbH, Austria

## Technical Program – Tuesday, July 25<sup>th</sup>

11:00 AM

**4093: Synthesis and Characterization of NaNbO<sub>3</sub>-Based Thin Films for Capacitor Applications from Chemical Solution Deposition**

Alexander Kobald, Herbert Kobald, Marco Deluca  
Materials Center Leoben Forschung GmbH, Austria

11:15 AM

**4302: Achieving Ultrahigh Energy Storage Density at Low Voltage in Lead Hafnate-Based Novel Perovskite Solid Solution**

Vidhi Chauhan, Bixia Wang, Alexei A Bokov, Zuo-Guang Ye  
Simon Fraser University, Canada

11:30 AM

**4346: Silver Niobate Tantalate-Based Ceramics and Thin Films for Energy Storage**

Jack Leber, Ahmad Safari  
Rutgers University, United States

11:45 AM

**4264: Dielectric Polymer Composite with Ultra-High Thermal Conductivity and Low Dielectric Loss**

Xiangyan Yu<sup>{2}</sup>, Michael Reece<sup>{2}</sup>, Emiliano Bilotti<sup>{1}</sup>  
<sup>{1}</sup>Imperial College London, United Kingdom; <sup>{2}</sup>Queen Mary University of London, United Kingdom

### Lead-Free 2

7/25/2023 10:00 AM - 7/25/2023 12:00 PM America/New York

Center Street B

*Andrea Roberto Insinga, Technical University of Denmark*

10:30 AM

**4140: Synthesis of New Sn(II)-Containing Perovskite Oxides in Pursuit of Lead-Free Ferroelectrics (Invited)**

Jacob Jones, Ryan Newell, Rachel Broughton, Eric Gabilondo, Shaun O'donnell, Paul Maggard  
North Carolina State University, United States

11:00 AM

**4035: Local Structure and Local Polar Order in Lead-Free Perovskite Relaxors**

Marco Deluca<sup>{3}</sup>, Florian Mayer<sup>{3}</sup>, Martin Kempa<sup>{2}</sup>, Venkata Raveendra Nallagatla<sup>{3}</sup>, Maxim N. Popov<sup>{3}</sup>, Klaus Reichmann<sup>{4}</sup>, Scott Mixture<sup>{1}</sup>, Petr Ondrejko<sup>{2}</sup>, Jiri Hlinka<sup>{2}</sup>, Jürgen Spitaler<sup>{3}</sup>  
<sup>{1}</sup>Alfred University, United States; <sup>{2}</sup>Fyzikální ústav AV ČR, v. v. i., Institute of Physics of the Czech Academy of Sciences, Czech Rep.; <sup>{3}</sup>Materials Center Leoben Forschung GmbH, Austria; <sup>{4}</sup>Technische Universität Graz, Austria

## Technical Program – Tuesday, July 25<sup>th</sup>

11:15 AM

**4216: Additive Manufacturing of Lead-Free Piezoelectric Ceramics (Young Investigator)**

Astri Bjørnetun Haugen

Technical University of Denmark, Denmark

11:45 AM

**4387: Flash Sintering and Dielectric Properties of  $K_{0.5}Na_{0.5}NbO_3$**

Enver Koray Akdoğan<sup>{2}</sup>, Ilyas Şavklıyıldız<sup>{1}</sup>

<sup>{1}</sup>Konya Technical University, Turkey; <sup>{2}</sup>Rutgers University, United States

### PFM 3

7/25/2023 10:00 AM - 7/25/2023 11:30 AM America/New York

Center Street C

*Yunseok Kim, Sungkyunkwan University*

10:00 AM

**4318: Ferroelectric Memristors (and Beyond) for Brain-Inspired Computing (Invited)**

Beatriz Noheda

University of Groningen, Zernike Institute for Advanced Materials, Netherlands

10:30 AM

**4098: Imprint Electric Field Control of Optical Polarization Switch Sign in  $BaTiO_3$  Films**

Ignasi Fina Martínez<sup>{2}</sup>, Huan Tan<sup>{2}</sup>, Gustavo Castro-Olivera<sup>{1}</sup>, Jike Lyu<sup>{2}</sup>, Pablo Loza-Alvarez<sup>{1}</sup>, Florencio Sánchez<sup>{2}</sup>, Josep Fontcuberta<sup>{2}</sup>

<sup>{1}</sup>ICFO, Barcelona Institute of Science and Technology, Spain; <sup>{2}</sup>ICMAB-CSIC Institut de Ciència de Materials de Barcelona, Spain

10:45 AM

**4374: Reduction of Voltage for Low Power Ferroelectric Devices, Through Graphene-Based Interfacial Engineering**

Shreyam Natani, Wade Shipley, Andrea Tao, Prabhakar Bandaru

University of California, San Diego, United States

11:00 AM

**4177: Spatially Resolved High Voltage Kelvin Probe Force Microscopy: a Novel Avenue for Examining Electrical Phenomena at Nanoscale**

Amit Kumar<sup>{1}</sup>, Conor J. McCluskey<sup>{1}</sup>, Jesi R. Maguire<sup>{1}</sup>, Niyorjyoti Sharma<sup>{1}</sup>, Serene Pauly<sup>{1}</sup>, Navneet Soin<sup>{2}</sup>, Kristina M. Holsgrove<sup>{1}</sup>, Brian Rodriguez<sup>{3}</sup>, J. Marty Gregg<sup>{1}</sup>, Raymond G.P. McQuaid<sup>{1}</sup>

<sup>{1}</sup>Queen's University of Belfast, United Kingdom; <sup>{2}</sup>Ulster University, United Kingdom; <sup>{3}</sup>University College Dublin, United Kingdom



## Technical Program – Tuesday, July 25<sup>th</sup>

11:15 AM

### 4262: **DART-SSPFM Multi-Imaging of Ferroelectric and Electrostatic Properties of KNN Thin Film at Nanoscale**

Hugo Valloire<sup>{1}</sup>, Nicolas Vaxelaire<sup>{2}</sup>, Hugo Kuentz<sup>{1}</sup>, Gwenael Le Rhun<sup>{1}</sup>, Lukasz Borowik<sup>{1}</sup>  
<sup>{1}</sup>CEA-Leti, France; <sup>{2}</sup>CEA-Leti, Université Grenoble Alpes, France

### **Hafnia-Based Devices**

7/25/2023 10:00 AM - 7/25/2023 11:45 AM America/New York

Hope A

*Samantha Jaszewski, University of Virginia*

10:00 AM

### 4195: **Material Issues in Ferroelectric Memory Devices and Potential Solutions (Invited)**

Min Hyuk Park

Seoul National University, Korea

10:30 AM

### 4165: **Hard X-Ray Photoelectron Spectroscopy of Polarization-Set Electronic Conditions Across Interfaces of Ferroelectric Epitaxial Y-Doped HfO<sub>2</sub> Films**

Megan O. Hill<sup>{2}</sup>, Nives Strkalj<sup>{2}</sup>, Mortiz L. Müller<sup>{2}</sup>, Maximilian T. Becker<sup>{2}</sup>, Ji Soo Kim<sup>{2}</sup>, Dibya Phuyal<sup>{1}</sup>, Judith L. Macmanus-Driscoll<sup>{2}</sup>

<sup>{1}</sup>KTH Royal Institute of Technology, Sweden; <sup>{2}</sup>University of Cambridge, United Kingdom

10:45 AM

### 4223: **Ferroelectric Controlled Electronic Band Structure in Doped $\beta$ -Ga<sub>2</sub>O<sub>3</sub>**

Anthony Boucly<sup>{2}</sup>, Tyson Back<sup>{1}</sup>, Thaddeus Asel<sup>{1}</sup>, Uwe Schroeder<sup>{4}</sup>, Claudia Richter<sup>{4}</sup>, Christoph Schlueter<sup>{3}</sup>, Nicolas Barrett<sup>{2}</sup>

<sup>{1}</sup>Air Force Research Laboratory, United States; <sup>{2}</sup>CEA Saclay, France; <sup>{3}</sup>German Electron Synchrotron DESY, Germany; <sup>{4}</sup>NaMLab gGmbH, Germany

11:00 AM

### 4393: **Flexoelectricity-Stabilized Ferroelectric Phase with Enhanced Reliability in Ultrathin La:HfO<sub>2</sub> Films**

Peijie Jiao, Yurong Yang, Di Wu

Nanjing University, China

11:15 AM

### 4082: **Electrode Work Function Impacts to Imprint in Ferroelectric and Antiferroelectric Hafnium Zirconium Oxide Thin Films**

Jon Ihlefeld, Shelby Fields, Samantha Jaszewski, Megan Lenox

University of Virginia, United States

## Technical Program – Tuesday, July 25<sup>th</sup>

11:30 AM

### 4156: **Influence of Interfaces on the Enhanced Ferroelectricity of Ultra-Thin HZO-Based Tunnel Junctions**

Greta Segantini<sup>{1}</sup>, Benoît Manchon<sup>{3}</sup>, Ingrid Cañero Infante<sup>{4}</sup>, Matthieu Bugnet<sup>{5}</sup>, Rabei Barhoumi<sup>{1}</sup>, Shruti Nirantar<sup>{8}</sup>, Edwin Mayes<sup>{7}</sup>, Pedro Rojo Romeo<sup>{2}</sup>, Nicholas Blanchard<sup>{6}</sup>, Damien Deleruyelle<sup>{4}</sup>, Sharath Sriram<sup>{8}</sup>, Bertrand Vilquin<sup>{2}</sup>  
<sup>{1}</sup>École Centrale de Lyon, France; <sup>{2}</sup>École Centrale de Lyon, CNRS, INSA Lyon, Université Claude Bernard Lyon 1, CPE Lyon, CNRS, INL, France; <sup>{3}</sup>INSA Lyon, France; <sup>{4}</sup>INSA Lyon, CNRS, Ecole Centrale de Lyon, Université Claude Bernard Lyon 1, CPE Lyon, INL, France; <sup>{5}</sup>INSA Lyon, MATEIS laboratory, CNRS, France; <sup>{6}</sup>Institut Lumière Matière, UMR5306, Université Lyon 1-CNRS, Université de Lyon, France; <sup>{7}</sup>RMIT Microscopy and Microanalysis Facility, RMIT University, Australia; <sup>{8}</sup>RMIT University, Australia

### **MEMS Material Characterization / Epitaxial Thin Films for MEMS**

7/25/2023 10:00 AM - 7/25/2023 12:00 PM America/New York

Hope B

*Yasuo Koide, National Institute for Materials Science and Hiroshi Funkubo, Tokyo Institute of Technology*

10:00 AM

### 4154: **Characterization of Piezoelectric (K, Na)NbO<sub>3</sub> Films for MEMS Applications (Invited)**

Hiroshi Funakubo<sup>{2}</sup>, Akinori Tateyama<sup>{2}</sup>, Yuichiro Orino<sup>{2}</sup>, Yoshiharu Ito<sup>{2}</sup>, Takahisa Shiraishi<sup>{2}</sup>, Takao Shimizu<sup>{1}</sup>, Minoru Kurosawa<sup>{2}</sup>  
<sup>{1}</sup>National Institute for Materials Science NIMS, Tokyo Institute of Technology, Japan; <sup>{2}</sup>Tokyo Institute of Technology, Japan

10:30 AM

### 4215: **What Affects the Measurements of Effective Longitudinal Piezoelectric Coefficient for Thin Films**

Jie Zhou<sup>{1}</sup>, Mingsheng Zhang<sup>{1}</sup>, Jianwei Chai<sup>{1}</sup>, Yasmin Mohamed Yousry<sup>{2}</sup>, Acharya Shashidhara<sup>{1}</sup>, Qinwen Xu<sup>{1}</sup>, Chengliang Sun<sup>{3}</sup>, Kui Yao<sup>{2}</sup>  
<sup>{1}</sup>Agency for Science, Technology and Research, Singapore; <sup>{2}</sup>Institute of Materials Research and Engineering, Agency for Science, Technology and Research, Singapore; <sup>{3}</sup>Wuhan University, China

10:45 AM

### 4108: **New Piezoelectric Polymer Characterization Tool Enabling the Development of Highly Reliable and Homogeneous Materials for Ductile Sensor Applications**

Tom Kremers<sup>{1}</sup>, Markys Cain<sup>{2}</sup>, Peter Mardilovich<sup>{1}</sup>, Thorsten Schmitz-Kempen<sup>{1}</sup>  
<sup>{1}</sup>aixACCT systems, Germany; <sup>{2}</sup>Electrosiences Ltd., United Kingdom

## Technical Program – Tuesday, July 25<sup>th</sup>

11:00 AM

### 4202: **MEMS Using Epitaxial PZT Family (Invited)**

Shuji Tanaka<sup>{1}</sup>, Shinya Yoshida<sup>{2}</sup>

<sup>{1}</sup>Tohoku University, Japan; <sup>{2}</sup>Tohoku University, Shibaura Institute of Technology, Japan

11:30 AM

### 4110: **High Piezoelectricity in Epitaxial BiFeO<sub>3</sub> Microcantilevers**

Sylvia Matzen<sup>{4}</sup>, Stéphane Gable<sup>{2}</sup>, Nathan Lequet<sup>{2}</sup>, Said Yousfi<sup>{1}</sup>, Komalika Rani<sup>{3}</sup>, Thomas Maroutian<sup>{4}</sup>, Guillaume Agnus<sup>{3}</sup>, Houssny Bouyanfif<sup>{1}</sup>, Philippe Lecoeur<sup>{3}</sup>

<sup>{1}</sup>Université de Picardie Jules Verne, Laboratoire de physique de la matière condensée UR2081, France; <sup>{2}</sup>Université Paris-Saclay, France; <sup>{3}</sup>Université Paris-Saclay, Center for Nanoscience and Nanotechnology, France; <sup>{4}</sup>Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, France

11:45 AM

### 4293: **Giant Electromechanical Response from Defective Epitaxial BaTiO<sub>3</sub> Integrated on Si (100)**

Shubham Kumar Parate<sup>{1}</sup>, Sandeep Vura<sup>{1}</sup>, Subhajit Pal<sup>{3}</sup>, Rajeev Rai<sup>{5}</sup>, Upanya Khandelwal<sup>{1}</sup>, Sri Harsha Molleti<sup>{1}</sup>, Girish Patil<sup>{1}</sup>, Mudit Jain<sup>{1}</sup>, Ambresh Malaya<sup>{1}</sup>, Majid Ahmadi<sup>{4}</sup>, Bart Kooi<sup>{4}</sup>, Rama Satya Sandilya<sup>{1}</sup>, Vishnu Kumar<sup>{1}</sup>, Sushobhan Ava

<sup>{1}</sup>Indian Institute of Science, India; <sup>{2}</sup>Indian Institute of Science, Center for Nanoscience Engineering, India; <sup>{3}</sup>Queen Mary University of London, United Kingdom; <sup>{4}</sup>University of Groningen, Netherlands; <sup>{5}</sup>University of Pennsylvania, United States

### **Tuesday Lunch**

7/25/2023 12:00 PM - 7/25/2023 1:30 PM America/New York

Hope Ballroom E

### **PFM International Board Meeting (Invitation ONLY)**

7/25/2023 12:00 PM - 7/25/2023 1:30 PM America/New York

Hope C

### **Career Workshop**

7/25/2023 12:00 PM - 7/25/2023 1:30 PM America/New York

Hope A

## Technical Program – Tuesday, July 25<sup>th</sup>

### Plenary: Prof. Jan Seidel

7/25/2023 1:30 PM - 7/25/2023 2:30 PM America/New York

Superior Ballroom DC

*Yonatan Calahorra, Technion – IIT, Department of Materials Science and Engineering, Israel*

### 4149: Functional Topological Defects: Materials at the Edge of Order

Jan Seidel

University of New South Wales, Australia

### Tuesday Afternoon Break

7/25/2023 2:30 PM - 7/25/2023 3:00 PM America/New York

Superior Ballroom AB

### Electrocaloric Effect & Antiferroelectrics

7/25/2023 3:00 PM - 7/25/2023 5:00 PM America/New York

Center Street A

*Brahim Dkhil, Univ. Paris-Saclay, CentraleSupélec*

3:00 PM

### 4068: Energy Storage and Caloric Ceramic Thick Films on Flexible Polymer Substrates

(Invited)

Hana Uršič<sup>{1}</sup>, Matej Šadl<sup>{1}</sup>, Victor Regis<sup>{1}</sup>, Ivana Gorican<sup>{1}</sup>, Uros Prah<sup>{2}</sup>, Emmanuel Defay<sup>{3}</sup>, Andrej Lebar<sup>{4}</sup>, Josko Valentincic<sup>{4}</sup>

<sup>{1}</sup>Jožef Stefan Institute, Slovenia; <sup>{2}</sup>Luxembourg Institute of Science and Technology, Luxembourg; <sup>{3}</sup>Luxembourg Institute of Science and Technology, MRT, FMT, Luxembourg; <sup>{4}</sup>University of Ljubljana, Slovenia

3:30 PM

### 4325: Nano-Scale Manipulation of Polar Entropy in Ferroelectric Polymers Generates Giant Electrocaloric Effect for Cooling

Shanyu Zheng, Donglin Han, Xiaoshi Qian

Shanghai Jiao Tong University, China

3:45 PM

### 4034: Contribution of Volumetric Changes to Caloric Response of Ferroelectric Thin Films

Cihan Arli, Ali Atilgan, Burc Misirlioglu

Sabancı University, Turkey

## Technical Program – Tuesday, July 25<sup>th</sup>

4:00 PM

**4366: Well-Defined Double Hysteresis Loop in NaNbO<sub>3</sub> Antiferroelectrics**

Nengneng Luo<sup>{2}</sup>, Li Ma<sup>{2}</sup>, Gengguang Luo<sup>{2}</sup>, Chao Xu<sup>{3}</sup>, Lixiang Rao<sup>{1}</sup>, Ye Zhu<sup>{3}</sup>, Jiawang Hong<sup>{1}</sup>, Jing-Feng Li<sup>{4}</sup>, Shujun Zhang<sup>{5}</sup>  
{1}Beijing Institute of Technology, China; {2}Guangxi University, China; {3}Hong Kong Polytechnic University, Hong Kong; {4}Tsinghua University, China; {5}University of Wollongong, ISEM, AIIIM, Australia

4:15 PM

**4023: PbZrO<sub>3</sub>-Based Antiferroelectric Ceramics with Ultrahigh Energy Efficiency**

Binzhi Liu, Anand P S Gaur, Jun Cui, Xiaoli Tan  
Iowa State University, United States

4:30 PM

**4152: Thermal Switching and Phase Transitions in Antiferroelectrics (Invited)**

Elena Buixaderas  
Fyzikální ústav AV ČR, v. v. i., Institute of Physics of the Czech Academy of Sciences, Czech Rep.

**Lead-Free 3**

7/25/2023 3:00 PM - 7/25/2023 4:45 PM America/New York

Center Street B

Brice Gautier, INSA Lyon, CNRS, Ecole Centrale de Lyon, Université Claude Bernard Lyon 1, CPE Lyon, INL

3:00 PM

**4131: Textured Calcium Bismuth Niobate (CaBi<sub>2</sub>Nb<sub>2</sub>O<sub>9</sub>) for High-Temperature Piezoelectric Applications (Invited)**

Chun-Ming Wang, Juan-Nan Chen, Qian Wang, Chun-Lei Wang  
Shandong University, China

3:30 PM

**4233: Enhanced Piezoelectric Properties and DC Electrical Resistivity of Tungsten-Substituted Bi<sub>3</sub>TiTaO<sub>9</sub> for High-Temperature Applications**

Qian Wang, Chen-Yang Liu, Chun-Ming Wang  
Shandong University, China

3:45 PM

**4145: Investigating the Structure-Property Relationships of Lead-Free Functional Ceramics (Young Investigator)**

Alicia Manjón-Sanz<sup>{1}</sup>, Caitlin Berger<sup>{2}</sup>, Charles Culbertson<sup>{2}</sup>, Michelle Dolgos<sup>{3}</sup>  
{1}Oak Ridge National Laboratory, United States; {2}Oregon State University, United States; {3}University of Calgary, Canada



## Technical Program – Tuesday, July 25<sup>th</sup>

4:15 PM

### 4141: **Importance of Domain Texture of Na<sub>1/2</sub>Bi<sub>1/2</sub>TiO<sub>3</sub>-Based Materials for High-Power Applications and Evaluation of its Temperature-Dependence**

Laura Cangini<sup>{1}</sup>, Andreas Wohninsland<sup>{1}</sup>, Daniel Bremecker<sup>{1}</sup>, Lovro Fulanović<sup>{2}</sup>, Changhao Zhao<sup>{1}</sup>, Jürgen Rödel<sup>{1}</sup>

<sup>{1}</sup>Technical University of Darmstadt, Germany; <sup>{2}</sup>Technical University of Darmstadt, Jožef Stefan Institute, Germany

4:30 PM

### 4231: **Rietveld Structural Analysis of New Bi-Based Piezoceramics with Morphotropic Phase Boundary**

Akhilesh Kumar Singh

Indian Institute of Technology BHU Varanasi, India

### **Lead Free Ferroelectric Thin Films**

7/25/2023 3:00 PM - 7/25/2023 4:45 PM America/New York

Center Street C

*Betul Akkopru-Akgun, The Pennsylvania State University*

3:00 PM

### 4042: **Thickness Scaling of Ultrathin Ferroelectric BaTiO<sub>3</sub> Films Grown by Pulsed Laser Deposition**

Pratik Bagul<sup>{2}</sup>, Sean McMitchell<sup>{1}</sup>, Jan Van Houdt<sup>{2}</sup>, Ingrid De Wolf<sup>{2}</sup>

<sup>{1}</sup>IMEC, Belgium; <sup>{2}</sup>IMEC, Katholieke Universiteit Leuven, Belgium

3:15 PM

### 4099: **Structural, Chemical and Electronic Structure Interplay in BaTiO<sub>3</sub> Ultrathin Films Probed Using X-Ray and Electron Spectroscopies**

Sara Gonzalez<sup>{2}</sup>, Matthieu Bugnet<sup>{3}</sup>, Patrick Schöffmann<sup>{4}</sup>, Edwige Otero<sup>{4}</sup>, Pedro Rojo Romeo<sup>{1}</sup>, Bertrand Vilquin<sup>{1}</sup>, Brice Gautier<sup>{2}</sup>, G. Herrera<sup>{5}</sup>, O. Boisron<sup>{5}</sup>, V. Dupuis<sup>{5}</sup>, Quentin M. Ramasse<sup>{6}</sup>, Philippe Ohresser<sup>{4}</sup>, Ingrid Canero Infante<sup>{2}</sup>

<sup>{1}</sup>École Centrale de Lyon, CNRS, INSA Lyon, Université Claude Bernard Lyon 1, CPE Lyon, CNRS, INL, France; <sup>{2}</sup>INSA Lyon, CNRS, Ecole Centrale de Lyon, Université Claude Bernard Lyon 1, CPE Lyon, INL, France; <sup>{3}</sup>INSA Lyon, MATEIS laboratory, CNRS, France; <sup>{4}</sup>Synchrotron SOLEIL, France; <sup>{5}</sup>Université de Lyon, Université Claude Bernard Lyon 1, Institut Lumière Matière, CNRS UMR 5306, France; <sup>{6}</sup>University of Leeds, SuperSTEM Laboratory, United Kingdom

3:30 PM

### 4362: **Investigations of Growth Spiral Formation and Their Influence on Ferroelectric Properties of Ultra-Thin Aurivillius Films**

Debismita Dutta, Louise Colfer, Lynette Keeney

Tyndall National Institute, University College Cork, Ireland

## Technical Program – Tuesday, July 25<sup>th</sup>

3:45 PM

### 4107: **Nanoscale Design of Layered Ferroelectrics Using Polarization Monitoring In-Situ**

Ipek Efe<sup>{2}</sup>, Elzbieta Gradauskaite<sup>{2}</sup>, Alexander Vogel<sup>{1}</sup>, Marta D. Rossell<sup>{1}</sup>, Manfred Fiebig<sup>{2}</sup>, Morgan Trassin<sup>{2}</sup>

<sup>{1}</sup>Electron Microscopy Center, Empa Swiss Federal Laboratories for Materials Science and Technology, Switzerland; <sup>{2}</sup>ETH Zürich, Switzerland

4:00 PM

### 4359: **Curie Temperature Characterization of Submicronic LiTaO<sub>3</sub> Thin Film in Poi Structure by In-Situ Raman Spectroscopy and X-Ray Diffraction**

Soazig Leforestier<sup>{1}</sup>, Van-Hoan Le<sup>{1}</sup>, Nicolas Vaxelaire<sup>{1}</sup>, Capucine Delage<sup>{1}</sup>, Alexis Drouin<sup>{2}</sup>, Isabelle Huyet<sup>{2}</sup>

<sup>{1}</sup>CEA-Leti, Université Grenoble Alpes, France; <sup>{2}</sup>SOITEC, France

4:15 PM

### 4040: **Environmentally-Friendly Lead-Free Perovskite Thin Films for Energy Storage Applications**

Martina Angermann<sup>{2}</sup>, Ivana Panzic<sup>{2}</sup>, Herbert Kobald<sup>{2}</sup>, Alexander Kobald<sup>{2}</sup>, Theresa Gindel<sup>{2}</sup>, Kristine Bakken<sup>{1}</sup>, Marco Deluca<sup>{2}</sup>

<sup>{1}</sup>Chalmers University of Technology, Sweden; <sup>{2}</sup>Materials Center Leoben Forschung GmbH, Austria

4:30 PM

### 4277: **Joint Influence of the Indium and Cooper Cation Sublattices on the Origin of Ferrielectricity in 2D CuInP<sub>2</sub>S<sub>6</sub>**

Yulian Vysochanskii<sup>{1}</sup>, Vitalii Liubachko<sup>{1}</sup>, Ruslan Yevych<sup>{1}</sup>, Konstantin Glukhov<sup>{1}</sup>, Anton Kohutych<sup>{1}</sup>, Viacheslav Hryts<sup>{1}</sup>, Andrius Dziaugys<sup>{2}</sup>, Jūras Banys<sup>{2}</sup>

<sup>{1}</sup>Uzhhorod University, Ukraine; <sup>{2}</sup>Vilnius University, Lithuania

### **Oxygen Vacancy & Electrode Effects on Hafnia**

7/25/2023 3:00 PM - 7/25/2023 4:45 PM America/New York

Hope A

*Min Hyuk Park, Seoul National University*

3:00 PM

### 4036: **Impact of Oxygen Content on the Ferroelectric Wake-Up Behavior in 45 nm Thick as-Deposited ZrO<sub>2</sub> Films**

Bohan Xu<sup>{1}</sup>, Patrick Lomenzo<sup>{1}</sup>, Liam Collins<sup>{3}</sup>, Kristina M. Holsgrove<sup>{4}</sup>, Thomas Mikolajick<sup>{2}</sup>, Uwe Schroeder<sup>{1}</sup>

<sup>{1}</sup>NaMLab gGmbH, Germany; <sup>{2}</sup>NaMLab gGmbH, Technische Universität Dresden, Germany; <sup>{3}</sup>Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, United States; <sup>{4}</sup>Queen's University of Belfast, United Kingdom

## Technical Program – Tuesday, July 25<sup>th</sup>

3:15 PM

### 4329: **Charged Oxygen Vacancies Promoted Phase Transitions in HfO<sub>2</sub>**

Li-Yang Ma, Shi Liu

Westlake University, Key Laboratory for Quantum Materials of Zhejiang Province, Westlake Institute, China

3:30 PM

### 4249: **Optimizing Oxygen Content and Stress in Doped HZO Using Kinetic Barriers and Free Energy Calculated from Density Functional Theory**

Luis Azevedo Antunes, Richard Ganser, Alfred Kersch

Munich University of Applied Sciences, Germany

3:45 PM

### 4083: **Impact of Electrode Materials on the Reliability Performance of Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub>-Based Ferroelectric Capacitors**

Ruben Alcalá<sup>{2}</sup>, Monica Materano<sup>{2}</sup>, Patrick Lomenzo<sup>{2}</sup>, Wassim Hamouda<sup>{1}</sup>, Nicolas Barrett<sup>{1}</sup>, Thomas Mikolajick<sup>{3}</sup>, Uwe Schroeder<sup>{2}</sup>

<sup>{1}</sup>CEA Saclay, France; <sup>{2}</sup>NaMLab gGmbH, Germany; <sup>{3}</sup>NaMLab gGmbH, Technische Universität Dresden, Germany

4:00 PM

### 4133: **A Study of Ferroelectric Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Thin Film on Mo Electrodes**

Younghwan Lee, Se Hyun Kim, Min Hyuk Park

Seoul National University, Korea

4:15 PM

### 4073: **Epitaxial Growth of Electrode-Free Ferroelectric Hf<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub> Films**

Eduardo Barriuso<sup>{3}</sup>, Ricardo Jiménez<sup>{1}</sup>, Eric Langenberg<sup>{4}</sup>, César Magén<sup>{2}</sup>, Panagiotis Koutsogiannis<sup>{2}</sup>, Manuel Varela<sup>{4}</sup>, Pedro Algarabel<sup>{2}</sup>, Miguel Algueró<sup>{1}</sup>, José Angel Pardo<sup>{3}</sup>  
<sup>{1}</sup>Instituto de Ciencia de Materiales de Madrid, CSIC, Spain; <sup>{2}</sup>Instituto de Nanociencia y Materiales de Aragón, CSIC-Universidad de Zaragoza, Spain; <sup>{3}</sup>Universidad de Zaragoza, Instituto de Nanociencia y Materiales de Aragón, CSIC, Spain; <sup>{4}</sup>Universitat de Barcelona, Spain

4:30 PM

### 4086: **Laser-Induced Selective Crystallization of Ferroelectric Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Films**

Alejandro Frechilla<sup>{1}</sup>, Mari Napari<sup>{4}</sup>, César Magén<sup>{1}</sup>, Kham Niang<sup>{3}</sup>, Eduardo Barriuso<sup>{2}</sup>, Germán F. de la Fuente<sup>{1}</sup>, Andrew Flewitt<sup>{3}</sup>, Judith L. Macmanus-Driscoll<sup>{3}</sup>, Luis A. Angurel<sup>{1}</sup>, José Angel Pardo<sup>{2}</sup>

<sup>{1}</sup>Instituto de Nanociencia y Materiales de Aragón, CSIC-Universidad de Zaragoza, Spain;

<sup>{2}</sup>Universidad de Zaragoza, Instituto de Nanociencia y Materiales de Aragón, CSIC, Spain;

<sup>{3}</sup>University of Cambridge, United Kingdom; <sup>{4}</sup>University of Southampton, Zepler Institute, United Kingdom

## Technical Program – Tuesday, July 25<sup>th</sup>

### Materials for Non-volatile Memory & Neuromorphic Computing

7/25/2023 3:00 PM - 7/25/2023 4:30 PM America/New York

Hope B

*Ignasi Fina Martinez, Institut de Ciència de Materials de Barcelona*

3:00 PM

#### 4012: **Dynamic Stabilization of Metastable States in Triple-Well Ferroelectric Sn<sub>2</sub>P<sub>2</sub>S<sub>6</sub>**

Sabine Neumayer<sup>{2}</sup>, Nora Bauer<sup>{3}</sup>, Sergey Basun<sup>{1}</sup>, Benjamin Conner<sup>{1}</sup>, Michael Susner<sup>{1}</sup>, Maxim Lavrentovich<sup>{3}</sup>, Petro Maksymovych<sup>{2}</sup>

<sup>{1}</sup>Air Force Research Laboratory, United States; <sup>{2}</sup>Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, United States; <sup>{3}</sup>University of Tennessee, Knoxville, United States

3:15 PM

#### 4020: **New Materials for Three Dimensional Ferroelectric Microelectronics**

Wanlin Zhu<sup>{2}</sup>, Jack Hayden<sup>{2}</sup>, Kevin Ferri<sup>{1}</sup>, Leonard Jacques<sup>{1}</sup>, Fan He<sup>{2}</sup>, Jung In Yang<sup>{1}</sup>, Jon-Paul Maria<sup>{2}</sup>, Thomas N. Jackson<sup>{1}</sup>, Susan Trolier-McKinstry<sup>{2}</sup>

<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>Pennsylvania State University, Materials Research Institute, United States

3:30 PM

#### 4199: **Resistive Switching Mechanism in AlFeO<sub>3</sub> Thin-Films Probed Using Synchrotron X-Ray**

Badari Narayana Rao<sup>{1}</sup>, Yuri Endo<sup>{1}</sup>, Nobu Nakajima<sup>{2}</sup>, Hiroko Yokota<sup>{1}</sup>

<sup>{1}</sup>Chiba University, Japan; <sup>{2}</sup>Hiroshima University, Japan

3:45 PM

#### 4201: **Ferroelectric Properties of Zinc Magnesium Oxide**

Leonard Jacques<sup>{1}</sup>, Gyunghyun Ryu<sup>{1}</sup>, Devin Goodling<sup>{1}</sup>, Smitha Shetty<sup>{1}</sup>, Betul Akkopru-Akgun<sup>{1}</sup>, Jon-Paul Maria<sup>{2}</sup>, Susan Trolier-McKinstry<sup>{2}</sup>

<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>Pennsylvania State University, Materials Research Institute, United States

4:00 PM

#### 4237: **Polarization Switching Fatigue Characteristics in B-Doped AlN Thin Films**

Fan He, Wanlin Zhu, John Hayden, Jon-Paul Maria, Susan Trolier-McKinstry

Pennsylvania State University, Materials Research Institute, United States

4:15 PM

#### 4197: **Understanding the Effect of Depolarization on Polarization in Ultra-Thin BaTiO<sub>3</sub> Films**

Thomas Lee<sup>{3}</sup>, Pravin Kavle<sup>{3}</sup>, Yizhe Jiang<sup>{3}</sup>, Christoph Klewe<sup>{1}</sup>, Padraic Shafer<sup>{1}</sup>, Ramamoorthy Ramesh<sup>{2}</sup>, Lane W. Martin<sup>{4}</sup>

<sup>{1}</sup>Lawrence Berkeley National Laboratory, United States; <sup>{2}</sup>Rice University, United States; <sup>{3}</sup>University of California, Berkeley, United States; <sup>{4}</sup>University of California, Berkeley, Lawrence Berkeley National Laboratory, United States

## Technical Program – Tuesday, July 25<sup>th</sup>

### Environment & Biomedical

7/25/2023 3:00 PM - 7/25/2023 4:45 PM America/New York

Hope D

Julia Glaum, *Norwegian University of Science and Technology*

3:00 PM

#### 4307: **Conformable Health Monitoring Platform with Organic-Inorganic Electronics (Invited)**

Vladimir Pozdin<sup>{1}</sup>, Pulak Bhushan<sup>{1}</sup>, Mauro Victorio<sup>{1}</sup>, Tanner Songkakul<sup>{2}</sup>, James Dieffenderfer<sup>{2}</sup>, Alper Bozkurt<sup>{2}</sup>, Michael Daniele<sup>{3}</sup>  
<sup>{1}</sup>Florida International University, United States; <sup>{2}</sup>North Carolina State University, United States; <sup>{3}</sup>University of North Carolina at Chapel Hill, United States

3:30 PM

#### 4053: **Structure-Property Relationships in Core-Shell Magnetoelectric Nanowires – Towards Minimally Invasive Neural Stimulation**

Noah Ferson, John Ganiban, Jennifer Andrew  
University of Florida, United States

3:45 PM

#### 4384: **Compositional Engineering of Functional Properties in (K,Na)NbO<sub>3</sub>-Based Bioceramics**

Caitlin Guzzo, Julia Glaum  
Norwegian University of Science and Technology, Norway

4:00 PM

#### 4328: **Competing Contributions to the Catalytic Activity of Barium Titanate**

Alain Pignolet<sup>{2}</sup>, Hossein Kalhori<sup>{1}</sup>, Ifeanyichukwu Amaechi<sup>{1}</sup>, Andreas Ruediger<sup>{1}</sup>  
<sup>{1}</sup>INRS - Centre Énergie Matériaux Télécommunications, Canada; <sup>{2}</sup>INRS - Institut National de la Recherche Scientifique, Canada

4:15 PM

#### 4146: **Piezocatalytic Hydrogen Evolution in Pure Water by Centrosymmetric Bi<sub>2</sub>Fe<sub>4</sub>O<sub>9</sub> Nanoplates**

Yumeng Du, Shujun Zhang, Zhenxiang Cheng  
University of Wollongong, ISEM, AIIM, Australia

4:30 PM

#### 4336: **Application and Improvement of Piezoelectric Materials in Medical Atomizer**

Jie You<sup>{2}</sup>, Haoqi Wu<sup>{2}</sup>, Haer Chu<sup>{3}</sup>, Yao Ma<sup>{1}</sup>  
<sup>{1}</sup>First Affiliated Hospital of Baotou Medical College, China; <sup>{2}</sup>Idaville Medical Technology Co., LTD, China; <sup>{3}</sup>Inner Mongolia Medical University, China



## Technical Program – Tuesday, July 25<sup>th</sup>

### Single Crystal Piezoelectrics

7/25/2023 3:00 PM - 7/25/2023 5:00 PM America/New York

Hope E

*Benjamin Ducharne, INSA Lyon, CNRS, Tohoku University, ELyTMax*

3:00 PM

#### 4056: **Enhanced Properties of Relaxor-PbTiO<sub>3</sub> Single Crystals via Alternating Current Poling (Invited)**

Xiaoning Jiang<sup>{1}</sup>, Hwang-Pill Kim<sup>{1}</sup>, Yohachi John Yamashita<sup>{2}</sup>

<sup>{1}</sup>North Carolina State University, United States; <sup>{2}</sup>Toyama Prefectural University, North Carolina State University, United States

3:30 PM

#### 4088: **Macro- and Microstructure of Ternary System Piezoelectric Relaxor-PbTiO<sub>3</sub> Single Crystals by AC Poling**

Hiroshi Maiwa<sup>{1}</sup>, Yu Xiang<sup>{1}</sup>, Yohachi John Yamashita<sup>{3}</sup>, Yiqin Sun<sup>{2}</sup>, Tomoaki Karaki<sup>{2}</sup>

<sup>{1}</sup>Shonan Institute of Technology, Japan; <sup>{2}</sup>Toyama Prefectural University, Japan; <sup>{3}</sup>Toyama Prefectural University, North Carolina State University, Japan

3:45 PM

#### 4235: **Solid State Crystal Growth of PMN-PT Using Uniaxial Hot Press**

Ashleigh Buck, Andrew J. Bell

University of Leeds, United Kingdom

4:00 PM

#### 4335: **Solid-State Crystal Growth of Potassium Sodium Niobate Ferroelectrics**

Peter Kabakov<sup>{1}</sup>, Sihai Zhou<sup>{2}</sup>, Shujun Zhang<sup>{2}</sup>

<sup>{1}</sup>Thales Underwater Systems, Australia; <sup>{2}</sup>University of Wollongong, ISEM, AIIIM, Australia

4:15 PM

#### 4004: **Dynamic Measurement of Capacitance Variation Under Applied Electric Field for Lithium Tantalate Single Crystal with Nonlinear Dielectric Constants**

Yasuo Cho<sup>{2}</sup>, Ryo Nakagawa<sup>{1}</sup>, Toshimaro Yoneda<sup>{1}</sup>, Takeshi Nakao<sup>{1}</sup>, Mamoru Ikeura<sup>{1}</sup>

<sup>{1}</sup>Murata Manufacturing Co., Ltd., Japan; <sup>{2}</sup>Tohoku University, Japan

4:30 PM

#### 4047: **Transparent Ferroelectric Crystals with Ultrahigh Piezoelectricity (Invited)**

Fei Li

Xi'an Jiaotong University, China

## Technical Program – Tuesday, July 25<sup>th</sup>

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**President's Reception (Invitation ONLY)**

7/25/2023 5:30 PM - 7/25/2023 7:00 PM America/New York

Hope C

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**Optional Tour: Royals @ Guardians Baseball Game**

7/25/2023 7:00 PM - 7/25/2023 10:00 PM America/New York

Progressive Field, Cleveland, Ohio

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## Technical Program – Wednesday, July 26<sup>th</sup>

### Featured Invited Talks on Sustainability

7/26/2023 8:30 AM - 7/26/2023 10:00 AM America/New York

Superior Ballroom DC

*Alp Sehirliglu, Case Western Reserve University*

8:30 AM

#### 4401: **A Sustainable Planet Earth? Past Developments and Future Options**

Jürgen Rödel

Technical University of Darmstadt, Germany

9:30 AM

#### 4275: **PiezoMEMS Applied in Environmental Monitoring**

Thor Bakke

Tunable AS, Norway

### Wednesday Morning Coffee Break

7/26/2023 10:00 AM - 7/26/2023 10:30 AM America/New York

Superior Ballroom AB

### Piezoelectric MEMS & NEMS 2

7/26/2023 10:30 AM - 7/26/2023 12:00 PM America/New York

Center Street A

*Susan Trolrier-McKinstry, Penn State*

10:30 AM

#### 4155: **Piezoelectric Sensors and Actuators: Micromechanical Motions That Make a Difference (Invited)**

Runar Plünnecke Dahl-Hansen, Christopher Andrew Dirdal, Paul Conrad Thrane, Zeljko Skokic  
SINTEF MiNaLab, Norway

11:00 AM

#### 4268: **Characterization of Thermally and Electrically Stressed Resonators Built on Poi Substrates**

Alexis Drouin<sup>{2}</sup>, Frederic Allibert<sup>{2}</sup>, Sebastien Ledrappier<sup>{2}</sup>, Florent Bernard<sup>{1}</sup>, Saly N'Diaye<sup>{1}</sup>,  
Emilie Courjon<sup>{1}</sup>

<sup>{1}</sup>frec'n'sys, France; <sup>{2}</sup>SOITEC, France

## Technical Program – Wednesday, July 26<sup>th</sup>

11:15 AM

**4340: Study on Thermoelectric-Piezoelectric Energy Supply Method for Autonomous Underwater Robot**

Ruoyan Chai, Linye Wang, Deshen Han, Wenqian Xu, Tianxiao Chen, Ting Ma  
Xi'an Jiaotong University, China

11:30 AM

**4370: Direct Deposition of BiFeO<sub>3</sub> Films on Flexible Substrates for Multisource Harvesting Devices**

Sergio López-Fajardo, Ricardo Jiménez, Íñigo Bretos, M. Lourdes Calzada, Jesús Ricote  
Instituto de Ciencia de Materiales de Madrid, CSIC, Spain

11:45 AM

**4373: Engineering Ferroelectricity with Large Piezoelectricity in Wurtzite Nitrides**

Mohammad Noor-A-Alam, Michael Nolan  
Tyndall National Institute, University College Cork, Ireland

**Lead-Free 4**

7/26/2023 10:30 AM - 7/26/2023 11:45 AM America/New York

Center Street B

*Juras Bany, Vilnius University*

10:30 AM

**4090: Lattice Defects in Lead-Free Potassium Sodium Niobate Ferroelectrics (Invited)**

Ke Wang, Yi-Xuan Liu, Ze Xu, Hao-Cheng Thong  
Tsinghua University, China

11:00 AM

**4091: Engineered Thermal Stability in Potassium Sodium Niobate Piezoceramics**

Yi-Xuan Liu, Hao-Cheng Thong, Jing-Feng Li, Ke Wang  
Tsinghua University, China

11:15 AM

**4376: Dielectric Properties of Low Temperature Sintering by SPS of Piezoelectric Lead Free (K,Na)NbO<sub>3</sub> Ceramics**

Christopher Castro Chavarría<sup>{3}</sup>, Catherine Elissalde<sup>{1}</sup>, U-Chan Seu Chung<sup>{2}</sup>, Mario Maglione<sup>{2}</sup>,  
Hélène Debeda<sup>{3}</sup>  
<sup>{1}</sup>CNRS, Université de Bordeaux, ICMCB, UMR 5026, France; <sup>{2}</sup>ICMCB, UMR5026, CNRS,  
Université de Bordeaux, Bordeaux INP, France; <sup>{3}</sup>Université de Bordeaux, Laboratoire IMS, UMR  
5218, CNRS, Université de Bordeaux, ICMCB, UMR 5026, France

## Technical Program – Wednesday, July 26<sup>th</sup>

11:30 AM

### 4229: **Local Structural Insights Into Antiferroelectric-Ferroelectric Phase Transitions in NaNbO<sub>3</sub>-Based Ceramics**

Cho Sandar Htet<sup>{2}</sup>, Alicia Manjón-Sanz<sup>{4}</sup>, Jue Liu<sup>{4}</sup>, Jing Kong<sup>{2}</sup>, Frederick Marlton<sup>{6}</sup>, Sanjib Nayak<sup>{3}</sup>, Daniel Sørensen<sup>{1}</sup>, Mads Ry Vogel Jørgensen<sup>{1}</sup>, Abhijit Pramanick<sup>{5}</sup>  
<sup>{1}</sup>Aarhus University, Denmark; <sup>{2}</sup>City University of Hong Kong, Hong Kong; <sup>{3}</sup>Indian Institute of Technology, Madras, India; <sup>{4}</sup>Oak Ridge National Laboratory, United States; <sup>{5}</sup>Université Paris-Saclay, CentraleSupélec, CNRS, Sorbonne Université, France; <sup>{6}</sup>University of Technology, Sydney, Australia

### **Strain Effects on Ferroelectric Thin Films**

7/26/2023 10:30 AM - 7/26/2023 11:30 AM America/New York

Center Street C

*Amit Kumar, Queen's University Belfast*

10:30 AM

### 4270: **Helium Implantation for Strain-Engineering: a New Route Towards Negative Pressures? (Invited)**

Constance Toulouse<sup>{6}</sup>, Alfredo Blázquez Martínez<sup>{1}</sup>, Lluís Yedra Cardona<sup>{3}</sup>, Pierre Fertey<sup>{2}</sup>, Vincent Garcia<sup>{4}</sup>, Stéphane Fusil<sup>{4}</sup>, Sebastjan Glinšek<sup>{1}</sup>, Veronika Kovacova<sup>{1}</sup>, Jean-Nicolas Audinot<sup>{1}</sup>, Torsten Granzow<sup>{1}</sup>, Emmanuel Defay<sup>{1}</sup>, Beatriz Noheda  
<sup>{1}</sup>Luxembourg Institute of Science and Technology, MRT, FMT, Luxembourg; <sup>{2}</sup>SOLEIL Synchrotron, CRISTAL Beamline, France; <sup>{3}</sup>Universitat de Barcelona, Spain; <sup>{4}</sup>Université Paris-Saclay, Unité Mixte de Physique, CNRS-Thales, France; <sup>{5}</sup>University of Groningen, Zernike Institute for Advanced Materials, Netherlands; <sup>{6}</sup>University of Luxembourg, Luxembourg

11:00 AM

### 4286: **Ferroelectricity in Epitaxially Strained Thin Films of a Binary Oxide**

Nives Strkalj, Zhuotong Sun, Ming Xiao, Sunil Taper, Atif Jan, Chuck Witt, Bartomeu Monserrat, Giuliana Di Martino, Judith L. Macmanus-Driscoll  
University of Cambridge, United Kingdom

11:15 AM

### 4241: **Impact of Strain Engineering of Antiferroelectricity in NaNbO<sub>3</sub> Thin Films**

Thorsten Schneider<sup>{2}</sup>, Juliette Cardoletti<sup>{1}</sup>, Philipp Komissinskiy<sup>{2}</sup>, Lambert Alff<sup>{2}</sup>  
<sup>{1}</sup>Luxembourg Institute of Science and Technology, Luxembourg; <sup>{2}</sup>Technical University of Darmstadt, Germany

## Technical Program – Wednesday, July 26<sup>th</sup>

### Wake-up & Thickness Scaling of Wurzite Ferroelectrics

7/26/2023 10:30 AM - 7/26/2023 12:00 PM America/New York

Hope A

*Brendan Hanrahan, U.S. Army Research Laboratory*

10:30 AM

#### 4164: **Are Ferroelectric Al<sub>1-x</sub>Sc<sub>x</sub>N Films Wake-Up Free?**

Simon Fichtner<sup>{2}</sup>, Maik Gremmel<sup>{1}</sup>, Niklas Wolff<sup>{1}</sup>, Georg Schönweger<sup>{2}</sup>, Md Redwanul Islam<sup>{1}</sup>, Adrian Petraru<sup>{1}</sup>, Hermann Kohlstedt<sup>{1}</sup>, Lorenz Kienle<sup>{1}</sup>, Fabian Lofink<sup>{3}</sup>  
<sup>{1}</sup>Christian-Albrechts-Universität zu Kiel, Germany; <sup>{2}</sup>Christian-Albrechts-Universität zu Kiel, Fraunhofer ISIT, Germany; <sup>{3}</sup>Fraunhofer Silicon Technology ISIT, Germany

10:45 AM

#### 4187: **Mechanism of Switching Dynamics and Wakeup Behavior of Wurtzite Ferroelectrics**

Keisuke Yazawa<sup>{3}</sup>, Daniel Drury<sup>{2}</sup>, John Hayden<sup>{5}</sup>, Jon-Paul Maria<sup>{5}</sup>, Wanlin Zhu<sup>{5}</sup>, Susan Troler-McKinstry<sup>{5}</sup>, Andriy Zakutayev<sup>{4}</sup>, Geoff L. Brennecke<sup>{1}</sup>  
<sup>{1}</sup>Colorado School of Mines, United States; <sup>{2}</sup>Colorado School of Mines, DEVCOM Army Research Laboratory, United States; <sup>{3}</sup>Colorado School of Mines, Materials Science Center, National Renewable Energy Laboratory, United States; <sup>{4}</sup>Materials Science Center, National Renewable Energy Laboratory, United States; <sup>{5}</sup>Pennsylvania State University, Materials Research Institute, United States

11:00 AM

#### 4095: **First Order Reversal Curves for the Evaluation of Thickness Dependent Ferroelectric Switching in Al<sub>0.7</sub>Sc<sub>0.3</sub>N Film**

Subhranu Samanta, Chen Liu, Zichu Wang, Li Chen, Yao Zhu, Minghua Li, Binni Varghese, Huamao Lin, Hock Koon Lee  
Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

11:15 AM

#### 4169: **Influence of Nitrogen Process Gas Flow on the Coercive and Breakdown Fields of 10 nm Thick Sputtered Aluminum Scandium Nitride**

Yinuo Zhang<sup>{2}</sup>, Jeffrey Zheng<sup>{2}</sup>, Giovanni Esteves<sup>{1}</sup>, Eric Stach<sup>{2}</sup>, Roy Olsson III<sup>{2}</sup>  
<sup>{1}</sup>Sandia National Laboratories, United States; <sup>{2}</sup>University of Pennsylvania, United States

11:30 AM

#### 4243: **Ferroelectricity in High-K BAIN Films Grown by Molecular Beam Epitaxy**

Chandrashekhar Savant, Ved Gund, Kazuki Nomoto, Takuya Maeda, Shubham Jadhav, Thai-Son Nguyen, Yu-Hsin Chen, Joseph Casamento, Amit Lal, Huili-Grace Xing, Debdeep Jena  
Cornell University, United States



## Technical Program – Wednesday, July 26<sup>th</sup>

11:45 AM

### 4186: **Thickness Scaling of Ferroelectric Wurtzite $\text{Al}_{1-x}\text{B}_x\text{N}$**

Joseph Casamento<sup>{2}</sup>, John Hayden<sup>{3}</sup>, Devin Goodling<sup>{2}</sup>, Joseph Shepard Jr.<sup>{1}</sup>, Giovanni Esteves<sup>{4}</sup>, Susan Trolier-McKinstry<sup>{3}</sup>, Jon-Paul Maria<sup>{3}</sup> <sup>{1}</sup>Applied Materials Inc., United States; <sup>{2}</sup>Pennsylvania State University, United States; <sup>{3}</sup>Pennsylvania State University, Materials Research Institute, United States; <sup>{4}</sup>Sandia National Laboratories, United States

### **Piezo 1**

7/26/2023 10:30 AM - 7/26/2023 11:30 AM America/New York

Hope B

*Brian Hosterman, Colorado Mesa University*

10:30 AM

### 4010: **Development and Characterization of Epoxy-Based Polymer Composites Containing Piezoelectric and Electrically Conductive Fillers**

Miray Yasar, Neal Murphy, Alojz Ivankovic  
University College Dublin, Ireland

10:45 AM

### 4059: **Enhancement of Acoustic Energy Conversion in Shear-Mode Piezoelectric PLLA Foam**

Yasmin Mohamed Yousry, Ayman Mahmoud Mohamed, Poh Chong Lim, Kui Yao  
Institute of Materials Research and Engineering, Agency for Science, Technology and Research, Singapore

11:00 AM

### 4069: **Towards Miniature Single Sample Characterisation (MSSC) of Piezoelectric Material with a Single Experimental Measurement**

Sakineh Fotouhi<sup>{4}</sup>, Zhen Zhang<sup>{1}</sup>, Mingwei He<sup>{2}</sup>, Yijia Hao<sup>{4}</sup>, Nathan Giles-Donovan<sup>{3}</sup>, Nicola Giuseppe Fenu<sup>{4}</sup>, Bo Liu<sup>{4}</sup>, Sandy Cochran<sup>{4}</sup>  
<sup>{1}</sup>Guangzhou University, China; <sup>{2}</sup>Nanyang Technological University, Singapore; <sup>{3}</sup>University of California, Berkeley, United States; <sup>{4}</sup>University of Glasgow, United Kingdom

11:15 AM

### 4285: **Pressure-Solution-Induced Features in Selected Cold-Sintered Perovskites**

Samir Salmanov<sup>{1}</sup>, Minghai Yao<sup>{2}</sup>, Maja Koblar<sup>{1}</sup>, Katarina Žiberna<sup>{1}</sup>, Andreja Benčan<sup>{1}</sup>, Brahim Dkhil<sup>{3}</sup>, Andraž Kocjan<sup>{1}</sup>, Barbara Malič<sup>{1}</sup>, Tadej Rojac<sup>{1}</sup>, Danjela Kuščer<sup>{1}</sup>, Mojca Otoničar<sup>{1}</sup>  
<sup>{1}</sup>Jožef Stefan Institute, Slovenia; <sup>{2}</sup>Université Paris-Saclay, CentraleSupélec, France; <sup>{3}</sup>Université Paris-Saclay, CentraleSupélec, SPMS, UMR CNRS 8580, France

## Technical Program – Wednesday, July 26<sup>th</sup>

### Wednesday Lunch

7/26/2023 12:00 PM - 7/26/2023 1:30 PM America/New York  
Hope Ballroom E

### WIE Lunch

7/26/2023 12:00 PM - 7/26/2023 1:30 PM America/New York  
Hope C

### 2016: Shattering Gender Barriers for Young Women in Science

#### Piezo 2

7/26/2023 1:30 PM - 7/26/2023 2:45 PM America/New York  
Center Street A  
*Andrew Bell, University of Leeds*

1:30 PM

#### 4377: Enhanced Electromechanical Properties in BiScO<sub>3</sub>-PbTiO<sub>3</sub> High Temperature Textured Ceramics

Xiaodan Ren<sup>{1}</sup>, Xin Liu<sup>{1}</sup>, Mingyang Tang<sup>{1}</sup>, Yike Wang<sup>{1}</sup>, Zhuo Xu<sup>{2}</sup>, Yongke Yan<sup>{2}</sup>  
<sup>{1}</sup>Electronic Materials Research Laboratory, Key Lab of Education Ministry, Xi'an Jiaotong University, China; <sup>{2}</sup>Xi'an Jiaotong University, Electronic Materials Research Laboratory, Key Lab of Education Ministry, China

1:45 PM

#### 4065: Inside Piezoelectricity: New Design Rules for High Performance Piezoelectric Materials

Andrew J. Bell  
University of Leeds, United Kingdom

2:00 PM

#### 4118: Transient Phase and Heating Rate Effects on Microstructure and Mechanical Strength of Cold Sintered ZnO Using Non-Destructive Ultrasonic Evaluation

Haley Jones<sup>{2}</sup>, Abdullah Jabr<sup>{1}</sup>, Clive Randall<sup>{2}</sup>, Raul Bermejo<sup>{1}</sup>, Andrea Argüelles<sup>{2}</sup>, Susan Trolier-McKinstry<sup>{3}</sup>  
<sup>{1}</sup>Montanuniversitaet Leoben, Austria; <sup>{2}</sup>Pennsylvania State University, United States; <sup>{3}</sup>Pennsylvania State University, Materials Research Institute, United States

2:15 PM

#### 4032: Terahertz Spectroscopy of Dielectric Materials for 6G Applications (Invited)

Takuya Hoshina  
Tokyo Institute of Technology, Japan

## Technical Program – Wednesday, July 26<sup>th</sup>

### Single Crystal Applications / Unusual & Novel Properties

7/26/2023 1:30 PM - 7/26/2023 4:00 PM America/New York

Center Street B

Shujun Zhang, University of Wollongong

1:30 PM

#### 4312: Piezoelectric Actuators Based on Ferroelectric Relaxor Crystals

Xiangyu Gao<sup>{2}</sup>, Jinfeng Liu<sup>{2}</sup>, Liao Qiao<sup>{2}</sup>, Haonan Jin<sup>{2}</sup>, Kaile Ren<sup>{2}</sup>, Shuxiang Dong<sup>{1}</sup>, Zhuo Xu<sup>{3}</sup>, Fei Li<sup>{2}</sup>

<sup>{1}</sup>Shenzhen University, China; <sup>{2}</sup>Xi'an Jiaotong University, China; <sup>{3}</sup>Xi'an Jiaotong University, Electronic Materials Research Laboratory, Key Lab of Education Ministry, China

1:45 PM

#### 4339: Ultra-High Frequency Self-Focusing Ultrasonic Transducer with Half-Concave Geometric

Jianxin Zhao, Chunlong Fei, Jun Chen, Yi Quan, Tianlong Zhao, Lifei Lou, Yintang Yang  
Xidian University, China

2:00 PM

#### 4356: Comparing Generation III Relaxor-PT Single Crystal with Modified PZT-4 for Power Ultrasonics Devices

Abdul Hadi Chibli<sup>{1}</sup>, Margaret Lucas<sup>{1}</sup>, Anthony Gachagan<sup>{2}</sup>, Sandy Cochran<sup>{1}</sup>

<sup>{1}</sup>University of Glasgow, United Kingdom; <sup>{2}</sup>University of Strathclyde, United Kingdom

2:15 PM

#### 4081: Polar and Tunable Anti-Phase Domain Boundary in Antiferroelectric PbZr<sub>1-x</sub>Ti<sub>x</sub>O<sub>3</sub> (Invited)

Nan Zhang<sup>{4}</sup>, Zheyi An<sup>{4}</sup>, Hiroko Yokota<sup>{1}</sup>, Marek Paściak<sup>{2}</sup>, Wei Ren<sup>{4}</sup>, Zuo-Guang Ye<sup>{3}</sup>

<sup>{1}</sup>Chiba University, Japan; <sup>{2}</sup>Fyzikální ústav AV ČR, v. v. i., Institute of Physics of the Czech Academy of Sciences, Czech Rep.; <sup>{3}</sup>Simon Fraser University, Canada; <sup>{4}</sup>Xi'an Jiaotong University, China

2:45 PM

#### 4067: Translational Boundaries As Incipient Ferrielectric Domains in Antiferroelectric PbZrO<sub>3</sub>

Ying Liu, Gustau Catalán

Institut Català de Nanociència i Nanotecnologia ICN2, Universitat Autònoma de Barcelona, Spain

3:00 PM

#### 4232: 3D Structure of Defects in Antiferroelectric NaNbO<sub>3</sub> Single Crystal

Leonardo Oliveira<sup>{2}</sup>, Leif Carstensen<sup>{1}</sup>, Hugh Simons<sup>{2}</sup>

<sup>{1}</sup>Technical University of Darmstadt, Germany; <sup>{2}</sup>Technical University of Denmark, Denmark

## Technical Program – Wednesday, July 26<sup>th</sup>

3:15 PM

### 4137: **Permissible Domain Walls in Monoclinic Ferroelectrics Phases**

Ido Biran, Semën Gorfman  
Tel Aviv University, Israel

3:30 PM

### 4242: **Record Efficiency Values of the Piezo-Photo-Catalytic Response with BiFeO<sub>3</sub>**

W. Amdouni<sup>{3}</sup>, Mojca Otoničar<sup>{1}</sup>, M. Fricaudet<sup>{5}</sup>, Pascale Gemeiner<sup>{5}</sup>, Nicolas Guiblin<sup>{5}</sup>, V. Butin<sup>{4}</sup>, Vincent Garcia<sup>{6}</sup>, Stéphane Fusil<sup>{6}</sup>, Jens Kreisel<sup>{7}</sup>, H. Maghraoui-Meherzi<sup>{2}</sup>, Brahim Dkhil<sup>{5}</sup>

<sup>{1}</sup>Jožef Stefan Institute, Slovenia; <sup>{2}</sup>Université de Tunis El-Manar, Faculté des Sciences de Tunis, LCAE LR99ES15, Tunisia; <sup>{3}</sup>Université de Tunis El-Manar, Université Paris-Saclay, Tunisia; <sup>{4}</sup>Université Paris-Saclay, CentraleSupélec, LGPM EA4038, France; <sup>{5}</sup>Université Paris-Saclay, CentraleSupélec, SPMS, UMR CNRS 8580, France; <sup>{6}</sup>Université Paris-Saclay, Unité Mixte de Physique, CNRS-Thales, France; <sup>{7}</sup>University of Luxembourg, Luxembourg

3:45 PM

### 4030: **Flexo-Photovoltaic Effect in MoS<sub>2</sub>**

Jian Shi  
Rensselaer Polytechnic Institute, United States

## Thin Film Devices & Performance

7/26/2023 1:30 PM - 7/26/2023 3:30 PM America/New York

Center Street C

*Yao Kui, Institute of Materials Research and Engineering, Agency for Science, Technology and Research*

1:30 PM

### 4112: **Role of Polarization-Photon Coupling in Ultrafast Terahertz Excitation of Ferroelectrics (Invited)**

Shihao Zhuang, Jiamian Hu  
University of Wisconsin-Madison, United States

2:00 PM

### 4258: **Optical Reading of Multistate Nonvolatile Oxide Memories Based on the Switchable Ferroelectric Photovoltaic Effect**

Alexandre Zing<sup>{1}</sup>, Sylvia Matzen<sup>{3}</sup>, Komalika Rani<sup>{2}</sup>, Thomas Maroutian<sup>{3}</sup>, Guillaume Agnus<sup>{2}</sup>, Philippe Lecoeur<sup>{2}</sup>

<sup>{1}</sup>Center for Nanoscience and Nanotechnology, Université Paris-Saclay, France; <sup>{2}</sup>Université Paris-Saclay, Center for Nanoscience and Nanotechnology, France; <sup>{3}</sup>Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, France

## Technical Program – Wednesday, July 26<sup>th</sup>

2:15 PM

**4029: Giant Pyroelectricity in Nanomembranes**

Jian Shi

Rensselaer Polytechnic Institute, United States

2:30 PM

**4134: Interface Modulation to Control Dead Layer Effect and Leakages in BST-Based Varactors**

Mudit Upadhyay<sup>{2}</sup>, Beatrice Negulescu<sup>{2}</sup>, Kevin Nadaud<sup>{2}</sup>, Julien Varignon<sup>{1}</sup>, Antoine Ruyter<sup>{1}</sup>,  
Jerome Wolfman<sup>{2}</sup>

<sup>{1}</sup>ENSICAEN, Laboratoire de Cristallographie et Sciences des Matériaux CRISMAT, France;

<sup>{2}</sup>Université de Tours, Greman UMR, CNRS, France

2:45 PM

**4344: Lead-Loss Compensation for Chemical Solution Processed Oriented PbZrO<sub>3</sub> Thin Films**

Milan Haddad, Zachary Beller, Nazanin Bassiri-Gharb

Georgia Institute of Technology G.W. Woodruff School of Mechanical Engineering, United States

3:00 PM

**4265: Aging in Potassium Sodium Niobate Thin Films**

Sona Hříbalová<sup>{1}</sup>, Betul Akkopru-Akgun<sup>{1}</sup>, Susan Trolier-McKinstry<sup>{2}</sup>

<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>Pennsylvania State University, Materials  
Research Institute, United States

3:15 PM

**4116: Electrical Degradation of Lead Zirconate Titanate (PZT) Films Under Superimposed AC and DC Electrical Fields**

Betul Akkopru-Akgun<sup>{1}</sup>, Susan Trolier-McKinstry<sup>{2}</sup>

<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>Pennsylvania State University, Materials  
Research Institute, United States

## Technical Program – Wednesday, July 26<sup>th</sup>

### Wurzite Ferroelectric Properties & Devices

7/26/2023 1:30 PM - 7/26/2023 4:00 PM America/New York

Hope A

*Simon Fichtner, Kiel University*

1:30 PM

#### 4251: **Strong Electro-Optic Effect in Mg-Doped ZnO Thin Films**

Tomoaki Yamada<sup>{2}</sup>, Xueyou Yuan<sup>{2}</sup>, Lei Meng<sup>{1}</sup>

<sup>{1}</sup>Chinese Academy of Sciences, China; <sup>{2}</sup>Nagoya University, Japan

1:45 PM

#### 4388: **Understanding Leakage Currents in Ferroelectric Al<sub>1-x</sub>B<sub>x</sub>N Thin Films**

John Hayden<sup>{3}</sup>, Joseph Casamento<sup>{2}</sup>, Joseph Shepard Jr.<sup>{1}</sup>, Susan Trolier-McKinstry<sup>{3}</sup>, Jon-Paul Maria<sup>{3}</sup>

<sup>{1}</sup>Applied Materials Inc., United States; <sup>{2}</sup>Pennsylvania State University, United States;

<sup>{3}</sup>Pennsylvania State University, Materials Research Institute, United States

2:00 PM

#### 4182: **Polarization and Switching in B-Doped AlN: Atomic -Scale Analysis via Scanning Transmission Electron Microscopy**

Elizabeth Dickey<sup>{1}</sup>, Sebastian Calderon<sup>{1}</sup>, John Hayden<sup>{2}</sup>, Jon-Paul Maria<sup>{2}</sup>

<sup>{1}</sup>Carnegie Mellon University, United States; <sup>{2}</sup>Pennsylvania State University, Materials Research Institute, United States

2:15 PM

#### 4050: **Leakage Mechanism of Ferroelectric Al<sub>0.7</sub>Sc<sub>0.3</sub>N Ultra-Thin Film**

Li Chen, Zichu Wang, Chen Liu, Minghua Li, Wendong Song, Weijie Wang, Binni Varghese, Hock Koon Lee, Huamao Lin, Yao Zhu

Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

2:30 PM

#### 4024: **In-Wafer Stress-Dependent Leakage Current in Ferroelectric Scandium-Doped Aluminum Nitride**

Li Chen, Chen Liu, Zichu Wang, Minghua Li, Wendong Song, Weijie Wang, Yao Zhu

Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

2:45 PM

#### 4100: **Structural and Ferroelectric Properties of All Epitaxial Al<sub>0.72</sub>Sc<sub>0.28</sub>N on Pt/n-GaN**

Md Redwanul Islam<sup>{1}</sup>, Georg Schönweger<sup>{2}</sup>, Niklas Wolff<sup>{1}</sup>, Maïke Gremmel<sup>{1}</sup>, Hermann Kohlstedt<sup>{1}</sup>, Simon Fichtner<sup>{2}</sup>, Lorenz Kienle<sup>{1}</sup>

<sup>{1}</sup>Christian-Albrechts-Universität zu Kiel, Germany; <sup>{2}</sup>Christian-Albrechts-Universität zu Kiel, Fraunhofer ISIT, Germany



## Technical Program – Wednesday, July 26<sup>th</sup>

3:00 PM

### 4125: **The Integration of Ferroelectric AlScN with Nitride Power Electronics**

Brendan Hanrahan<sup>{4}</sup>, Keisuke Yazawa<sup>{3}</sup>, Daniel Drury<sup>{2}</sup>, David Mackie<sup>{4}</sup>, Randy Tompkins<sup>{4}</sup>, Geoff L. Brennecka<sup>{1}</sup>  
<sup>{1}</sup>Colorado School of Mines, United States; <sup>{2}</sup>Colorado School of Mines, DEVCOM Army Research Laboratory, United States; <sup>{3}</sup>Colorado School of Mines, Materials Science Center, National Renewable Energy Laboratory, United States; <sup>{4}</sup>DEVCOM Army Research Laboratory, United States

3:15 PM

### 4300: **Reversible Hysteresis in AlScN/GaN Ferroelectric Field Effect Transistors**

Thai-Son Nguyen<sup>{1}</sup>, Jimmy Encomendero<sup>{1}</sup>, Kazuki Nomoto<sup>{1}</sup>, Joseph Casamento<sup>{2}</sup>, Chandrashekhar Savant<sup>{1}</sup>, Huili-Grace Xing<sup>{1}</sup>, Debdeep Jena<sup>{1}</sup>  
<sup>{1}</sup>Cornell University, United States; <sup>{2}</sup>Pennsylvania State University, United States

3:30 PM

### 4284: **Ferroelectric AIBN on Mo/SiC Operating at 400 °C for Non-Volatile Memory**

Daniel Drury<sup>{2}</sup>, Brendan Hanrahan<sup>{4}</sup>, Glen Fox<sup>{5}</sup>, Keisuke Yazawa<sup>{3}</sup>, Emad Andarawis<sup>{6}</sup>, David Shaddock<sup>{6}</sup>, Geoff L. Brennecka<sup>{1}</sup>  
<sup>{1}</sup>Colorado School of Mines, United States; <sup>{2}</sup>Colorado School of Mines, DEVCOM Army Research Laboratory, United States; <sup>{3}</sup>Colorado School of Mines, Materials Science Center, National Renewable Energy Laboratory, United States; <sup>{4}</sup>DEVCOM Army Research Laboratory, United States; <sup>{5}</sup>Fox Materials Consulting, LLC, United States; <sup>{6}</sup>GE Global Research, United States

3:45 PM

### 4150: **Patterning of Sc<sub>0.3</sub>Al<sub>0.7</sub>N Film for Piezoelectric MEMS Devices**

Zhan Jiang Quek, Minghua Li, Yan Hong, Yijun Lim, Huamao Lin  
Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

#### **PFM 4**

7/26/2023 1:30 PM - 7/26/2023 4:00 PM America/New York

Hope B

*Beatriz Noheda, University of Groningen*

1:30 PM

### 4309: **Probing Domains and Domain Walls Near Defect Regions in Layered Ferroelectrics (Invited)**

Lynette Keeney, Debismita Dutta, Louise Colfer  
Tyndall National Institute, University College Cork, Ireland

## Technical Program – Wednesday, July 26<sup>th</sup>

2:00 PM

### 4106: **How Random Is the Domain Distribution Upon the Emergence of Ferroelectricity?**

Asaf Hershkovitz<sup>{1}</sup>, Doaa Khorshid<sup>{1}</sup>, Elangovan Hemaprabha<sup>{1}</sup>, Li-Yang Ma<sup>{2}</sup>, Shi Liu<sup>{2}</sup>, Yachin Ivry<sup>{1}</sup>

<sup>{1}</sup>Technion – Israel Institute of Technology, Solid State Institute, Israel; <sup>{2}</sup>Westlake University, Key Laboratory for Quantum Materials of Zhejiang Province, Westlake Institute, China

2:15 PM

### 4386: **AFM-Assisted Electrical Approach for the Surface Functionalization of Poly(L-Lactic Acid)**

Maxim Ivanov, Júlio Rocha, Paula Vilarinho  
Universidade de Aveiro, Portugal

2:30 PM

### 4011: **Nanoscale Ferroelectric Characterization with Advanced Multi-Frequency Scanning Probe Microscopies (Invited)**

Kaiyang Zeng  
National University of Singapore, Singapore

3:00 PM

### 4390: **Information Recovery in Resonant Piezoresponse Force Microscopy**

Kerisha Williams<sup>{1}</sup>, Henry Yuchi<sup>{1}</sup>, Kevin Gardy Ligonde<sup>{1}</sup>, Matthew Repasky<sup>{1}</sup>, Yao Xie<sup>{1}</sup>, Nazanin Bassiri-Gharb<sup>{2}</sup>

<sup>{1}</sup>Georgia Institute of Technology, United States; <sup>{2}</sup>Georgia Institute of Technology G.W. Woodruff School of Mechanical Engineering, United States

3:15 PM

### 4274: **Exploring Sub-Coercive Field Domain Wall Motion Dynamics with Piezo Response Scanning Oscillator Microscopy**

Shivaranjan Raghuraman, Kyle P. Kelley, Stephen Jesse  
Oak Ridge National Laboratory, United States

3:30 PM

### 4130: **Switchable Tribology of Ferroelectrics**

Seongwoo Cho<sup>{4}</sup>, Iaroslav Gaponenko<sup>{4}</sup>, Kumara Cordero-Edwards<sup>{4}</sup>, Jordi Barceló-Mercader<sup>{3}</sup>, Irene Arias<sup>{3}</sup>, Céline Lichtensteiger<sup>{4}</sup>, Loïc Musy<sup>{4}</sup>, Gustau Catalán<sup>{1}</sup>, Seungbum Hong<sup>{2}</sup>, Patrycja Paruch<sup>{4}</sup> <sup>{1}</sup>Institut Català de Nanociència i Nanotecnologia ICN2, Universitat Autònoma de Barcelona, Spain; <sup>{2}</sup>Korea Advanced Institute of Science and Technology, Korea; <sup>{3}</sup>Universitat Politècnica de Catalunya, Spain; <sup>{4}</sup>University of Geneva, Switzerland

## Technical Program – Wednesday, July 26<sup>th</sup>

3:45 PM

### 4144: **High Speed Imaging of Surface Charge Dynamics via Spiral Scanning KPFM and Gaussian Process inpainting**

Marti Checa<sup>{1}</sup>, Kyle P. Kelley<sup>{1}</sup>, Rama K. Vasudevan<sup>{1}</sup>, Maxim Ziatdinov<sup>{1}</sup>, Seok Joon Yun<sup>{1}</sup>, Stephen Jesse<sup>{1}</sup>, Liam Collins<sup>{2}</sup>

<sup>{1}</sup>Oak Ridge National Laboratory, United States; <sup>{2}</sup>Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, United States

### Wednesday Afternoon Break

7/26/2023 4:00 PM - 7/26/2023 4:30 PM America/New York  
Superior Ballroom AB

### Wednesday Posters

7/26/2023 4:00 PM - 7/26/2023 5:30 PM America/New York  
Superior Ballroom AB  
*Brendan Hanrahan, U.S. Army Research Laboratory*

### 4225: **Process Optimization of Sc<sub>0.2</sub>Al<sub>0.8</sub>N Bimorph Stack Deposition on 200mm Si Wafer**

Peng Liu, Minghua Li, Huamao Lin, Zhan Jiang Quek, Binni Varghese, Yao Zhu  
Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

### 4226: **Structural Strain of Piezoelectric Films on MEMS Diaphragm Structures and its Suppression Through Fabrication Process for High Conversion Efficiency**

Kaoru Yamashita, Kentaro Yamamoto, Ryoma Endo, Takuma Yoshida  
Kyoto Institute of Technology, Japan

### 4228: **Phase-Field Modelling of Piezoelectric Materials Using Laguerre Tessellations**

Emil Lyththans Boesen, Rasmus Bjørk, Astri Bjørnetun Haugen, Andrea Roberto Insinga  
Technical University of Denmark, Denmark

### 4239: **Correlating a and B Site Co-Doping Effects and the Crystallographic Structural Analysis of Pb and Bi Free Sr<sub>2</sub>NaNb<sub>5</sub>O<sub>15</sub> (SNN) Tetragonal Tungsten Bronze**

Celine M. King<sup>{1}</sup>, Jeremiah P. Tidey<sup>{2}</sup>, Mark S. Senn<sup>{2}</sup>, Steven J. Milne<sup>{1}</sup>, Andy P. Brown<sup>{1}</sup>, Thomas Brown<sup>{1}</sup>, Rik Brydson<sup>{1}</sup>, Andrew J. Bell<sup>{1}</sup>

<sup>{1}</sup>University of Leeds, United Kingdom; <sup>{2}</sup>University of Warwick, United Kingdom

### 4246: **Design and Modeling of a Dual-Driving Piezoelectric Micromachined Ultrasonic Transducer**

Le-Ming He<sup>{1}</sup>, Yan Wang<sup>{1}</sup>, Ning Lv<sup>{1}</sup>, Wei-Jiang Xu<sup>{2}</sup>, Jun-Yan Ren<sup>{1}</sup>

<sup>{1}</sup>Fudan University, China; <sup>{2}</sup>Université Polytechnique Hauts-de-France, France

## Technical Program – Wednesday, July 26<sup>th</sup>

### 4248: Round-Trip Performance Optimization and Characterization for Piezoelectric Material Micromachined Ultrasonic Transducer

Le-Ming He<sup>{1}</sup>, Wei-Jiang Xu<sup>{2}</sup>, Yan Wang<sup>{1}</sup>, Ning Lv<sup>{1}</sup>, Jun-Yan Ren<sup>{1}</sup>  
<sup>{1}</sup>Fudan University, China; <sup>{2}</sup>Université Polytechnique Hauts-de-France, France

### 4253: Exfoliation of Single c-Domain Pb(Zr,Ti)O<sub>3</sub> Films on CaF<sub>2</sub>(001) Substrates Using Sacrificial Water-Soluble Layers

Kazuhiro Takahashi, Masahito Yoshino, Takanori Nagasaki, Tomoaki Yamada  
Nagoya University, Japan

### 4259: High Energy Storage Density and Electrostrictive Coefficient with Less Hysteresis Loss in Lead-Free Eu<sup>+3</sup> Doped Ferroelectrics

Ranjan Kumar Sahu<sup>{1}</sup>, Saket Asthana<sup>{2}</sup>  
<sup>{1}</sup>Indian Institute of Technology Hyderabad, India; <sup>{2}</sup>Indian Institute of Technology, Hyderabad, India

### 4260: Site Engineering: Tool to Enhance Functional Properties in High-Temperature Lead-Free Relaxors Prepared via Air Quenching

Srishti Paliwal, Akhilesh Kumar Singh  
Indian Institute of Technology BHU Varanasi, India

### 4263: Wakeup-Free Robust Ferroelectricity, Electro-Caloric Cooling and Piezoelectricity in Solution- Processed La Doped Hafnia Thick Films

Jalaja M A<sup>{1}</sup>, Pavan Nukala<sup>{2}</sup>  
<sup>{1}</sup>Indian Institute of Science, India; <sup>{2}</sup>Indian Institute of Science, Center for Nanoscience Engineering, India

### 4271: Flexoelectricity Induced from Interfacial Polarization in Silicon-Based Barrier Layer Capacitors

Travis Peters<sup>{3}</sup>, Ryan Hawks<sup>{3}</sup>, Guy Lavallee<sup>{4}</sup>, Liam Collins<sup>{2}</sup>, Nina Balke<sup>{1}</sup>, Shad Roundy<sup>{5}</sup>, Susan Trolier-McKinstry<sup>{4}</sup>  
<sup>{1}</sup>North Carolina State University, United States; <sup>{2}</sup>Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, United States; <sup>{3}</sup>Pennsylvania State University, United States; <sup>{4}</sup>Pennsylvania State University, Materials Research Institute, United States; <sup>{5}</sup>University of Utah, United States

### 4279: Impact of Non-Uniform Ferroelectric Dielectric Phase and Metal Grains on the Performance of MFM Capacitor and Ferroelectric Fets

Nitanshu Chauhan<sup>{2}</sup>, Amit Behera<sup>{1}</sup>, Chirag Garg<sup>{3}</sup>, Sudeb Dasgupta<sup>{1}</sup>, Anand Bulusu<sup>{1}</sup>  
<sup>{1}</sup>Indian Institute of Technology Roorkee, India; <sup>{2}</sup>National Institute of Technology Uttarakhand, India; <sup>{3}</sup>University of California, Berkeley, United States

## Technical Program – Wednesday, July 26<sup>th</sup>

### 4289: **Microstructure in Fluorite-Structure Ferroelectrics and its Correlation to Electrical Characteristics**

Nashrah Afroze<sup>{1}</sup>, Sarah Lombardo<sup>{1}</sup>, Kisung Chae<sup>{3}</sup>, Chinsung Park<sup>{1}</sup>, Mengkun Tian<sup>{1}</sup>, Nujhat Tasneem<sup>{1}</sup>, Harish Kumarasubramanian<sup>{4}</sup>, Jae Hur<sup>{1}</sup>, Winston Chern<sup>{1}</sup>, Shimeng Yu<sup>{1}</sup>, Jayakanth Ravichandran<sup>{4}</sup>, Andrew Kummel<sup>{3}</sup>, Kyeongjae Cho<sup>{5}</sup>, Nazanin Ba<sup>{1}</sup> Georgia Institute of Technology, United States; <sup>{2}</sup>Georgia Institute of Technology G.W. Woodruff School of Mechanical Engineering, United States; <sup>{3}</sup>University of California, San Diego, United States; <sup>{4}</sup>University of Southern California, United States; <sup>{5}</sup>University of Texas Dallas, United States

### 4290: **Extraordinarily Large Extrinsic Contribution to Piezoresponse in Monoclinic (K, Na)NbO<sub>3</sub> Epitaxial Films**

Xueyou Yuan<sup>{2}</sup>, Kazuki Okamoto<sup>{2}</sup>, Mitsuki Kawano<sup>{2}</sup>, Masahito Yoshino<sup>{2}</sup>, Takanori Nagasaki<sup>{2}</sup>, Yasuhiko Imai<sup>{1}</sup>, Osami Sakata<sup>{1}</sup>, Tomoaki Yamada<sup>{2}</sup>  
<sup>{1}</sup>Japan Synchrotron Radiation Research Institute, Japan; <sup>{2}</sup>Nagoya University, Japan

### 4299: **Study of the Structural, Optical and Dielectric Properties of the (Na<sub>0.5</sub>Bi<sub>0.5</sub>)<sub>x</sub>-1RE<sub>x</sub>TiO<sub>3</sub> System**

Stefane Lira<sup>{1}</sup>, Clemens Burda<sup>{1}</sup>, Adolfo Franco<sup>{2}</sup>  
<sup>{1}</sup>Case Western Reserve University, United States; <sup>{2}</sup>Universidade Federal de Goias, Brazil

### 4304: **Using Nonlinear Electric Fields in Non-Planar Geometries for Low-Voltage Operation of Ferroelectric Field Effect Transistor Based Memory Devices**

Shreyam Natani, Prabhakar Bandaru  
University of California, San Diego, United States

### 4311: **Enhancement in Polarization and Energy Density of PVDF Matrix Using CeO<sub>2</sub>-NPs As Filler in Nanocomposite Thick Film**

Vishwa Pratap Singh, Akhilesh Kumar Singh  
Indian Institute of Technology BHU Varanasi, India

### 4314: **Characterization of Piezoelectric Functionality in Aqueous Media**

Mohsen Sadeqi-Moqadam, Julia Glaum  
Norwegian University of Science and Technology, Norway

### 4321: **BiFeO<sub>3</sub> Perovskite Films As Advanced Materials with Manifold Applications in Emerging Technologies**

Íñigo Bretos, Ricardo Jiménez, Y. Andrea Rivas, Sergio López-Fajardo, Adriana Barreto, Maria Echániz-Cíntora, Jesus Ricote, M. Lourdes Calzada  
Instituto de Ciencia de Materiales de Madrid, CSIC, Spain



## Technical Program – Wednesday, July 26<sup>th</sup>

### 4327: **Ultrahigh Recoverable Energy and Efficiency in Composites Bi<sub>0.5</sub>Na<sub>0.25</sub>K<sub>0.25</sub>TiO<sub>3</sub>-LiTaO<sub>3</sub> Based Perovskite Structure Relaxor Piezoelectric**

Dhanranjan Kumar, Sanjeeb Kumar Rout  
Birla Institute of Technology, Ranchi, India

### 4338: **Potassium Sodium Niobite Based Lead-Free Piezoelectric Ceramics: from Fundamental Research to Applications**

Jing Xing, Zhi Tan, Jiagang Wu, Jianguo Zhu  
Sichuan University, China

### 4342: **Fabrication of High-Quality La:Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Ferroelectric Gate Dielectric Film by Chemical Solution Process**

Yali Cai<sup>{1}</sup>, Liang Yu<sup>{2}</sup>, Wenfeng Yue<sup>{2}</sup>, Chong Zhang<sup>{1}</sup>, Quansheng Guo<sup>{1}</sup>, Tingting Jia<sup>{1}</sup>  
<sup>{1}</sup>Hubei University, China; <sup>{2}</sup>Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

### 4343: **Preparation of xMn-BiMg<sub>0.5</sub>Ti<sub>0.75</sub>O<sub>3</sub> Thin Films for High-Energy Storage Application**

Liang Yu<sup>{2}</sup>, Yali Cai<sup>{1}</sup>, Wenfeng Yue<sup>{2}</sup>, Chong Zhang<sup>{1}</sup>, Quansheng Guo<sup>{1}</sup>, Tingting Jia<sup>{1}</sup>  
<sup>{1}</sup>Hubei University, China; <sup>{2}</sup>Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

### 4347: **Selective Crystallization of Ferroelectric HfxZr<sub>1-x</sub>O<sub>2</sub> via Excimer Laser Annealing**

Myeong Seop Song, Kunwoo Park, Kyoungjun Lee, Jung Woo Cho, Tae Yoon Lee, Jungwon Park, Seung Chul Chae  
Seoul National University, Korea

### 4348: **A Two Degree-of-Freedom Ultrasonic Motor Based on Ferroelectric Relaxor Crystals**

Haonan Jin, Xiangyu Gao, Kaile Ren, Fei Li  
Xi'an Jiaotong University, China

### 4351: **Preparation and Evaluation of Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub> and Bi<sub>4-x</sub>Nd<sub>x</sub>Ti<sub>3</sub>O<sub>12</sub> Crystals**

Hiroshi Maiwa, Haiyang Sun  
Shonan Institute of Technology, Japan

### 4352: **Effect of Dielectric Constant Electrolyte on High-Speed Chargeability in Nanodot-BaTiO<sub>3</sub> Supported LiCoO<sub>2</sub> Cathode Thin Film Batteries**

Shintaro Yasui<sup>{2}</sup>, Daigo Nanasawa<sup>{2}</sup>, Sou Yasuhara<sup>{2}</sup>, Takashi Teranishi<sup>{1}</sup>, Ayumi Itoh<sup>{2}</sup>, Yoshinao Kobayashi<sup>{2}</sup>  
<sup>{1}</sup>Okayama University, Japan; <sup>{2}</sup>Tokyo Institute of Technology, Japan



## Technical Program – Wednesday, July 26<sup>th</sup>

### 4353: **Selective Area Epitaxy of Complex Oxide Heterostructures on Si by Oxide Hard Mask Lift-Off**

Seung-Hyub Baek  
Korea Institute of Science and Technology, Korea

### 4357: **Tuneable Semiconductor Properties of Bismuth Ferrite by Defect Engineering**

Michael Gunawan, Yimeng Jin, Xueqing Fang, Teng Chi Leung, Owen Bowdler, Cui Ying Toe, Qi Zhang, Judy Hart, Nagarajan Valanoor, Rose Amal, Jason Scott  
University of New South Wales, Australia

### 4367: **Revealing Fast Cu-Ion Motion in $\text{CuInP}_2\text{S}_6$ - $\text{In}_{4/3}\text{P}_2\text{S}_6$ Flakes Through the Ferroelectric to Paraelectric Phase Transition**

Marti Checa<sup>{3}</sup>, Xin Jin<sup>{5}</sup>, S. Neumayer<sup>{4}</sup>, Ruben Millan-Solsona<sup>{2}</sup>, Michael Susner<sup>{1}</sup>, Michael McGuire<sup>{3}</sup>, Andrew O'Hara<sup>{5}</sup>, Gabriel Gomila<sup>{2}</sup>, Petro Maksymovych<sup>{4}</sup>, Sokrates Pantelides<sup>{5}</sup>, Liam Collins<sup>{4}</sup>  
<sup>{1}</sup>Air Force Research Laboratory, United States; <sup>{2}</sup>Institute for Bioengineering of Catalonia IBEC, United States; <sup>{3}</sup>Oak Ridge National Laboratory, United States; <sup>{4}</sup>Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, United States; <sup>{5}</sup>Vanderbilt University, United States

### 4371: **Significantly Enhanced Strain in Lead-Free $(\text{Bi}_{1/2}\text{Na}_{1/2})\text{TiO}_3$ Ferroelectric Thin Films**

Jinyan Zhao<sup>{2}</sup>, Zhe Wang<sup>{2}</sup>, Gang Niu<sup>{2}</sup>, Genshui Wang<sup>{1}</sup>, Henghui Cai<sup>{1}</sup>, Xin Li<sup>{1}</sup>, Wei Ren<sup>{2}</sup>  
<sup>{1}</sup>Chinese Academy of Sciences, China; <sup>{2}</sup>Xi'an Jiaotong University, China

### 4375: **Band Gap Engineering of $\text{Ba}(\text{Ni}_{1/3}\text{Nb}_{2/3})\text{xTi}_{1-x}\text{O}_3$ Ceramics for Ferro-Photovoltaic Applications**

Deep Mala, Chandra Bhal Singh, Akhilesh Kumar Singh  
Indian Institute of Technology BHU Varanasi, India

### 4379: **Charge Trapping Effects on Memory Window in Ferroelectric Field Effect Transistors**

Nujhat Tasneem, Zheng Wang, Sarah Lombardo, Hang Chen, Shimeng Yu, Winston Chern, Asif Khan  
Georgia Institute of Technology, United States

### 4380: **Low-Toxicity Chemical Solution Deposition of Ferroelectric $\text{HfO}_2$**

Miguel Badillo<sup>{2}</sup>, Sepide Taleb<sup>{2}</sup>, Brenda Carreno<sup>{2}</sup>, Rebeca Castanedo<sup>{1}</sup>, Gerardo Torres<sup>{1}</sup>, Beatriz Noheda<sup>{3}</sup>, Mónica Acuautla<sup>{2}</sup>  
<sup>{1}</sup>Centro de Investigación y de Estudios Avanzados del I.P.N., Mexico; <sup>{2}</sup>University of Groningen, Netherlands; <sup>{3}</sup>University of Groningen, Zernike Institute for Advanced Materials, Netherlands

### 4383: **Improving Toughness of Porous PZT Through $\text{MgO}$ Inclusions**

Ben Prevoznak<sup>{1}</sup>, Eric Neuman<sup>{2}</sup>, Geoff L. Brennecka<sup>{1}</sup>  
<sup>{1}</sup>Colorado School of Mines, United States; <sup>{2}</sup>Sandia National Laboratories, United States

## Technical Program – Wednesday, July 26<sup>th</sup>

### 4385: **Structures and Velocities of Noisy Ferroelectric Domain Walls**

Nora Bauer<sup>{2}</sup>, Sabine Neumayer<sup>{1}</sup>, Petro Maksymovych<sup>{1}</sup>, Maxim Lavrentovich<sup>{2}</sup>  
<sup>{1}</sup>Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, United States;  
<sup>{2}</sup>University of Tennessee, Knoxville, United States

### 4391: **Influence of Volume and Layer Thickness of Textured Multilayer Energy Harvester for Energy Conversion**

Wei Ting Chen, Ahmet Erkan Gurdal, Safakcan Tuncdemir  
QorTek, Inc., United States

### 4392: **Exploring YOF As a Candidate Material for Ferroelectric Thin Films**

Emilee Fortier<sup>{1}</sup>, John Hayden<sup>{2}</sup>, Devin Goodling<sup>{1}</sup>, Joseph Casamento<sup>{1}</sup>, Jon-Paul Maria<sup>{2}</sup>  
<sup>{1}</sup>Pennsylvania State University, United States; <sup>{2}</sup>Pennsylvania State University, Materials  
Research Institute, United States

### 4395: **Structural and Dielectric Properties of Sodium Bismuth Titanate Doped with Transition Metals**

Stefane Lira<sup>{1}</sup>, Adolfo Franco<sup>{2}</sup>  
<sup>{1}</sup>Case Western Reserve University, United States; <sup>{2}</sup>Universidade Federal de Goias, Brazil

### 4396: **Ferroelectric Domain Configurations in Thin PIN-PMN-PT Single Crystals with Different Thicknesses and Poling Conditions**

Hwang-Pill Kim<sup>{1}</sup>, Yohachi John Yamashita<sup>{2}</sup>, Xiaoning Jiang<sup>{1}</sup>  
<sup>{1}</sup>North Carolina State University, United States; <sup>{2}</sup>Toyama Prefectural University, North Carolina  
State University, Japan

### **Student Pitch Competition**

7/26/2023 5:30 PM - 7/26/2023 6:30 PM America/New York  
Hope A

### **Gala Dinner**

7/26/2023 6:30 PM - 7/26/2023 8:30 PM America/New York  
Hope Ballroom DE

## Technical Program – Thursday, July 27<sup>th</sup>

### Lead-Free 5

7/27/2023 8:30 AM - 7/27/2023 9:15 AM America/New York

Center Street A

*Abhijit Pramanick, City University of Hong Kong*

8:30 AM

#### 4111: **Ice Templated Lead-Free Porous Ferroelectric Ceramics and Composites for Hydrostatic Applications**

Alex Tezcan<sup>{3}</sup>, Hamideh Khanbareh<sup>{2}</sup>, James Roscow<sup>{2}</sup>, Guylaine Poulin-Vittrant<sup>{1}</sup>, Chris Bowen<sup>{2}</sup>

<sup>{1}</sup>Université de Tours, Greman UMR, CNRS, France; <sup>{2}</sup>University of Bath, United Kingdom;

<sup>{3}</sup>University of Bath / GREMAN Tours, United Kingdom

8:45 AM

#### 4267: **Enhanced Grain Growth and Electrical Properties in Aerosol Deposited BaTiO<sub>3</sub>**

Marcus Bentzen<sup>{3}</sup>, Juliana Maier<sup>{1}</sup>, Udo Eckstein<sup>{1}</sup>, Anja Henss<sup>{2}</sup>, Neamul Khansur<sup>{1}</sup>, Julia Glaum<sup>{3}</sup>

<sup>{1}</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; <sup>{2}</sup>Justus-Liebig-University Gießen, Germany; <sup>{3}</sup>Norwegian University of Science and Technology, Norway

9:00 AM

#### 4205: **Fabrication of (Ba,Ca)(Zr,Ti)O<sub>3</sub>-Based Transparent Ceramics by Conventional Pressureless Sintering Technique**

Ichiro Fujii, Koki Tobita, Shintaro Ueno, Satoshi Wada

University of Yamanashi, Japan

### Domains 3

7/27/2023 8:30 AM - 7/27/2023 9:30 AM America/New York

Center Street B

*Mauro Antonio Pereira Goncalves, Centre for Physics of the University of Coimbra*

8:30 AM

#### 4194: **Domain Wall Continuity Throughout Polycrystalline Ferroelectrics**

John Daniels, Sukriti Mantri

University of New South Wales, Australia

8:45 AM

#### 4074: **Atomic-Scale Characterization of 180° Conductive Domain Walls in Pb<sub>zr</sub>0.1Ti<sub>0.9</sub>O<sub>3</sub>**

Panagiotis Koutsogiannis<sup>{2}</sup>, Felix Risch<sup>{1}</sup>, José Angel Pardo<sup>{3}</sup>, Igor Stolichnov<sup>{1}</sup>, César Magén<sup>{2}</sup>

<sup>{1}</sup>École Polytechnique Fédérale de Lausanne, Switzerland; <sup>{2}</sup>Instituto de Nanociencia y Materiales de Aragón, CSIC-Universidad de Zaragoza, Spain; <sup>{3}</sup>Universidad de Zaragoza, Instituto de Nanociencia y Materiales de Aragón, CSIC, Spain

## Technical Program – Thursday, July 27<sup>th</sup>

9:00 AM

**4139: Strain Engineering by Dislocation Imprint in Ferroelectrics: Concept, Anisotropy, and Stability (Young Investigator)**

Fangping Zhuo<sup>{2}</sup>, Shuang Gao<sup>{2}</sup>, Xiandong Zhou<sup>{1}</sup>, Bai-Xiang Xu<sup>{2}</sup>, Jurij Koruza<sup>{3}</sup>, Jürgen Rödel<sup>{2}</sup>

<sup>{1}</sup>Sichuan University, China; <sup>{2}</sup>Technical University of Darmstadt, Germany; <sup>{3}</sup>Technische Universität Graz, Austria

9:15 AM

**4247: Controlling Highly Conductive Domain Walls in Tetragonal Pb(Zr,Ti)O<sub>3</sub> with Monolayer Graphene Electrodes**

Felix Risch<sup>{1}</sup>, Panagiotis Koutsogiannis<sup>{2}</sup>, Yuri Tikhonov<sup>{3}</sup>, Sadegh Kamaei<sup>{1}</sup>, Adrian Ionescu<sup>{1}</sup>, César Magén<sup>{2}</sup>, Igor Lukyanchuk<sup>{3}</sup>, Igor Stolichnov<sup>{1}</sup>

<sup>{1}</sup>École Polytechnique Fédérale de Lausanne, Switzerland; <sup>{2}</sup>Instituto de Nanociencia y Materiales de Aragón, CSIC-Universidad de Zaragoza, Spain; <sup>{3}</sup>University of Picardie, France

### Energy Storage 2

7/27/2023 8:30 AM - 7/27/2023 9:30 AM America/New York

Center Street C

Marco Deluca, MCL

8:30 AM

**4003: Grain-Orientation-Engineered Multilayer Ceramic Capacitors for Energy Storage Applications (Invited)**

Jinglei Li<sup>{4}</sup>, Zhonghui Shen<sup>{3}</sup>, Xianghua Chen<sup>{4}</sup>, Shuai Yang<sup>{4}</sup>, Wenlong Zhou<sup>{4}</sup>, Mingwen Wang<sup>{4}</sup>, Linghang Wang<sup>{4}</sup>, Qiangwei Kou<sup>{1}</sup>, Yingchun Liu<sup>{1}</sup>, Qun Li<sup>{4}</sup>, Zhuo Xu<sup>{5}</sup>, Yunfei Chang<sup>{1}</sup>, Shujun Zhang<sup>{2}</sup>, Fei Li<sup>{4}</sup>

<sup>{1}</sup>Harbin Institute of Technology, China; <sup>{2}</sup>University of Wollongong, ISEM, AIIIM, Australia; <sup>{3}</sup>Wuhan University of Technology, China; <sup>{4}</sup>Xi'an Jiaotong University, China; <sup>{5}</sup>Xi'an Jiaotong University, Electronic Materials Research Laboratory, Key Lab of Education Ministry, China

9:00 AM

**4341: Excellent Energy Storage Density of Bi<sub>3.25</sub>La<sub>0.75</sub>Ti<sub>3</sub>O<sub>12</sub>/Bi<sub>0.5</sub>Na<sub>0.5</sub>TiO<sub>3</sub> Multilayer Thin Films**

Wenfeng Yue<sup>{2}</sup>, Liang Yu<sup>{2}</sup>, Yali Cai<sup>{1}</sup>, Ting Li<sup>{2}</sup>, Lixia Liu<sup>{2}</sup>, Quansheng Guo<sup>{1}</sup>, Tingting Jia<sup>{1}</sup>, Shuhui Yu<sup>{2}</sup>, Rong Sun<sup>{2}</sup>

<sup>{1}</sup>Hubei University, China; <sup>{2}</sup>Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

9:15 AM

**4322: Grain Boundary Chemistry and Electrical Potential in Co-Doped BaTiO<sub>3</sub>**

Seonghwan Hong, Elizabeth Dickey  
Carnegie Mellon University, United States

## Technical Program – Thursday, July 27<sup>th</sup>

### **Wurzite Ferroelectrics: Electrodes & Measurements**

7/27/2023 8:30 AM - 7/27/2023 9:15 AM America/New York

Hope A

*Keisuke Yazawa, Colorado School of Mines*

8:30 AM

### **4038: Thermal Assisted Intermixing at AlScN/Pt Interfaces**

Minghua Li, Wendong Song, Chen Liu, Li Chen, Huamao Lin, Yao Zhu

Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

8:45 AM

### **4203: The Effect of Molybdenum Grain Characteristics on Ferroelectric Al<sub>0.7</sub>Sc<sub>0.3</sub>N Film Properties**

Kan Hu, Minghua Li, Huamao Lin, Binni Varghese, Yao Zhu

Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

9:00 AM

### **4294: New Materials Vs High Speed Measurements**

Joe Evans, Sean Smith, Mike McDaniel, Eduardo Villareal

Radiant Technologies, Inc., United States

### **Hafnia**

7/27/2023 8:30 AM - 7/27/2023 9:30 AM America/New York

Hope B

*Pravin Kavle, University of California Berkeley*

8:30 AM

### **4048: Performance Improvement via Stack Engineering and Post-Bake Retention State Stabilization in Fully CMOS Compatible HfO<sub>2</sub>-Based RRAM**

Subhranu Samanta, Chen Zhixian, Hock Koon Lee, Weijie Wang, Song Wendong, Yao Zhu, Li Chen, Chen Liu

Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

8:45 AM

### **4076: Surface-Assisted Stabilization of Epitaxial Ferroelectric Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Thin Films**

Jesse Schimpf<sup>{3}</sup>, Xuezheng Lu<sup>{2}</sup>, Abel Fernandez<sup>{3}</sup>, James Rondinelli<sup>{1}</sup>, Lane W. Martin<sup>{4}</sup>

<sup>{1}</sup>Northeastern University, United States; <sup>{2}</sup>Southeast University, China; <sup>{3}</sup>University of California, Berkeley, United States; <sup>{4}</sup>University of California, Berkeley, Lawrence Berkeley National

Laboratory, United States

## Technical Program – Thursday, July 27<sup>th</sup>

9:00 AM

**4097: Optimal La and Zr Doping in Epitaxial Ferroelectric HfO<sub>2</sub> Films**

Ignasi Fina Martínez, Tingfeng Song, Huan Tan, Saúl Estandía, Florencio Sánchez  
ICMAB-CSIC Institut de Ciència de Materials de Barcelona, Spain

9:15 AM

**4136: Enhancement of Ferroelectric Properties of Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Thin Film with Rapid Thermal Annealing Under Alternating Electric Field**

Sho Tanaka, Takumi Hayakawa, Minoru Noda  
Kyoto Institute of Technology, Japan

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**Thursday Morning Coffee Break**

7/27/2023 9:30 AM - 7/27/2023 10:00 AM America/New York  
Superior Ballroom AB

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**Piezo 3**

7/27/2023 10:00 AM - 7/27/2023 12:00 PM America/New York  
Center Street A  
*Neus Domingo Marimon, CNMS/ORNL*

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10:00 AM

**4044: Synthesis and Characterization of a New Ferroelectric with Low Lead Content, a High Piezoelectric Response, and a High Curie Temperature (Invited)**

Thomas Rowe, Brooke Richtik, Michelle Dolgos  
University of Calgary, Canada

10:30 AM

**4027: Identification of Piezoelectric Parameters of a Soft PZT Ceramic Using Mixed Numerical-Experimental Method**

Mahmoud Barati<sup>{1}</sup>, Laurent Daniel<sup>{2}</sup>  
<sup>{1}</sup>CentraleSupélec, GeePs, IPSA, France; <sup>{2}</sup>Université Paris-Saclay, CentraleSupélec, GeePs, CNRS, Sorbonne Université, France

10:45 AM

**4320: Influence of High DC Bias Fields on the Resonance Behavior of Piezoceramics**

Jurij Koruza<sup>{3}</sup>, Tomaž Kos<sup>{1}</sup>, Mihail Slabki<sup>{2}</sup>  
<sup>{1}</sup>Jožef Stefan Institute, Slovenia; <sup>{2}</sup>Technical University of Darmstadt, Germany; <sup>{3}</sup>Technische Universität Graz, Austria



## Technical Program – Thursday, July 27<sup>th</sup>

11:00 AM

**4276: Cu-Modified 0.42PMN-0.25PZ-0.33PT Textured Ceramics with Enhanced Piezoelectric Properties and Fatigue Resistance**

Linjing Liu<sup>{1}</sup>, Bin Yang<sup>{1}</sup>, Shuai Yang<sup>{2}</sup>, Rui Lv<sup>{1}</sup>, Qiangwei Kou<sup>{1}</sup>, Hang Xie<sup>{1}</sup>, Yuan Sun<sup>{1}</sup>, Yunfei Chang<sup>{1}</sup>, Fei Li<sup>{2}</sup>

<sup>{1}</sup>Harbin Institute of Technology, China; <sup>{2}</sup>Xi'an Jiaotong University, China

11:15 AM

**4224: Experimental Study of the Functional Fatigue of Ferroelectric Ceramics Subjected to Electromechanical Loadings**

Chaimae Babori<sup>{1}</sup>, Mahmoud Barati<sup>{2}</sup>, Laurent Daniel<sup>{3}</sup>

<sup>{1}</sup>CentraleSupélec, GeePs, France; <sup>{2}</sup>CentraleSupélec, GeePs, IPSA, France; <sup>{3}</sup>Université Paris-Saclay, CentraleSupélec, GeePs, CNRS, Sorbonne Université, France

11:30 AM

**4172: Breakdown Voltage of Ga<sub>2</sub>O<sub>3</sub> MESFETs with Aerosol Jet Printed Passivation (Invited)**

Laura Davidson<sup>{2}</sup>, Kyle Liddy<sup>{1}</sup>, Jeremiah Williams<sup>{1}</sup>, Daniel Dryden<sup>{1}</sup>, Fahima Ouchen<sup>{3}</sup>, Twinkle Pandhi<sup>{1}</sup>, Roberto Aga<sup>{3}</sup>, Carrie Bartsch<sup>{1}</sup>, Emily Heckman<sup>{1}</sup>

<sup>{1}</sup>Air Force Research Laboratory, United States; <sup>{2}</sup>KBR Inc., United States; <sup>{3}</sup>KBR Inc., U.S. Air Force, United States

### Unusual & Novel Properties

7/27/2023 10:00 AM - 7/27/2023 11:45 AM America/New York

Center Street B

*Sabine Neumayer, Oak Ridge National Laboratory*

10:00 AM

**4283: Nanoscale Effects in Piezoelectric Semiconductors (Invited)**

Yonatan Calahorra

Technion – IIT, Department of Materials Science and Engineering, Israel

10:30 AM

**4026: Band Structures of Dynamic Electromagnonic Crystals Based on Ferrite-Ferroelectric Thin-Film Multilayers**

Aleksei Nikitin, Erkki Lähderanta

Lappeenranta-Lahti University of Technology LUT, Finland

10:45 AM

**4028: Room-Temperature Ferroelectrically Switchable Rashba-Dresselhaus Spin-Momentum Locking in a Van der Waals Hybrid Perovskite with Persistent Spin Helix**

Jian Shi

Rensselaer Polytechnic Institute, United States

## Technical Program – Thursday, July 27<sup>th</sup>

11:00 AM

### 4306: **Electric Field Induced Movement of Polar Topological Defect in Epitaxially Strained BiFeO<sub>3</sub> Thin Film**

Sukriti Mantri, Sergei Prokhorenko, Yousra Nahas, Laurent Bellaiche  
University of Arkansas, United States

11:15 AM

### 4080: **Electrostriction: the Other Electro-Mechanical Coupling (Invited)**

Jiacheng Yu<sup>{4}</sup>, Daniel Tanner<sup>{5}</sup>, Dennis P. Trujillo<sup>{7}</sup>, Lucile Féger<sup>{1}</sup>, Ashok Gurung<sup>{6}</sup>, Antoine Pautonnier<sup>{1}</sup>, Daniel Bennett<sup>{2}</sup>, Sanjeev K. Nayak<sup>{6}</sup>, Abdelali Zaki<sup>{4}</sup>, Pascale Gemeiner<sup>{3}</sup>, Sandrine Coste<sup>{1}</sup>, Maud Barré<sup>{1}</sup>, Philippe Ghosez<sup>{2}</sup>, Philippe Lacorre<sup>{1}</sup>, Eric Bousquet<sup>{2}</sup>, S. Pamir Alpay<sup>{6}</sup>, Pierre-Eymeric Janolin<sup>{3}</sup>

<sup>{1}</sup>Institute of Molecules and Materials of Le Mans-UMR CNRS 6283, Université du Maine, France; <sup>{2}</sup>QMAT, CESAM, University of Liège, Belgium; <sup>{3}</sup>Université Paris-Saclay, CentraleSupélec, SPMS, UMR CNRS 8580, France; <sup>{4}</sup>Université Paris-Saclay, CNRS, CentraleSupélec, IMMM-UMR CNRS 6283, Université du Maine, France; <sup>{5}</sup>Université Paris-Saclay, CNRS, CentraleSupélec, QMAT, CESAM, University of Liège, Belgium; <sup>{6}</sup>University of Connecticut, United States; <sup>{7}</sup>University of Connecticut, Argonne National Laboratory, United States

### **Thin Film Multiferroics, Domains, & Antiferroelectrics**

7/27/2023 10:00 AM - 7/27/2023 11:45 AM America/New York

Center Street C

*Aiping Chen, Los Alamos National Laboratory*

10:00 AM

### 4087: **Novel Tetragonal Phase in Multiferroic (1-x)BiFeO<sub>3</sub>-(x)BaTiO<sub>3</sub> Films**

Taeyeon Kim<sup>{4}</sup>, Jesse Schimpf<sup>{4}</sup>, Anthony Ruffino<sup>{2}</sup>, Atanu Samanta<sup>{1}</sup>, Michael Xu<sup>{3}</sup>, James M. Lebeau<sup>{3}</sup>, Ilya Grinberg<sup>{1}</sup>, Jonathan E. Spanier<sup>{2}</sup>, Lane W. Martin<sup>{5}</sup>

<sup>{1}</sup>Bar-Ilan University, Israel; <sup>{2}</sup>Drexel University, United States; <sup>{3}</sup>Massachusetts Institute of Technology, United States; <sup>{4}</sup>University of California, Berkeley, United States; <sup>{5}</sup>University of California, Berkeley, Lawrence Berkeley National Laboratory, United States

10:15 AM

### 4252: **Structural, Vibrational, and Magnetic Investigation of BiFeO<sub>3</sub>/LaFeO<sub>3</sub> Superlattices Grown on DyScO<sub>3</sub> (110)**

Mouna Khiari<sup>{3}</sup>, Maxime Vallet<sup>{1}</sup>, Brahim Dkhil<sup>{4}</sup>, Psacal Ruello<sup>{2}</sup>, Houssny Bouyanfif<sup>{3}</sup>

<sup>{1}</sup>CentraleSupélec, Laboratoire Structures, Propriétés et Modélisation des Solides, France; <sup>{2}</sup>Institut des Molécules et Matériaux du Mans, France; <sup>{3}</sup>Université de Picardie Jules Verne, Laboratoire de physique de la matière condensée UR2081, France; <sup>{4}</sup>Université Paris-Saclay, CentraleSupélec, SPMS, UMR CNRS 8580, France

## Technical Program – Thursday, July 27<sup>th</sup>

10:30 AM

### 4363: **Tuning of Multiferroic Behavior in Metal-Oxide Films and Nanocomposites (Invited)**

Menka Jain

University of Connecticut, United States

11:00 AM

### 4211: **Phase Diagram and Domain Wall Properties in PbTiO<sub>3</sub> Ferroelectric Thin Films**

Ludovica Tovaglieri, Marios Hadjimichael, Jean-Marc Triscone, Céline Lichtensteiger

University of Geneva, Switzerland

11:15 AM

### 4218: **Charged Domain Walls and Dense Ferroelastic Domain Structures in Buckled Ferroelectric Membranes**

David Pesquera<sup>{2}</sup>, Kumara Cordero<sup>{1}</sup>, Martí Checa<sup>{1}</sup>, Felip Santdiumenge<sup>{1}</sup>, Marcos Rosado<sup>{1}</sup>, Blai Casals<sup>{1}</sup>, Jose Manuel Caicedo Roque<sup>{1}</sup>, José Santiso<sup>{1}</sup>, Neus Domingo<sup>{1}</sup>, Gustau Catalán<sup>{1}</sup>

<sup>{1}</sup>Institut Català de Nanociència i Nanotecnologia ICN2, Universitat Autònoma de Barcelona, Spain; <sup>{2}</sup>N2, Catalan Institute of Nanoscience and Nanotechnology, Oak Ridge National Laboratory, Spain

11:30 AM

### 4317: **Size-Induced Ferroelectricity in Antiferroelectric Oxide Membranes**

Ruijuan Xu<sup>{4}</sup>, Kevin J. Crust<sup>{6}</sup>, Varun Harbola<sup>{6}</sup>, Rémi Arras<sup>{7}</sup>, Kinnary Y. Patel<sup>{8}</sup>, Sergey Prosandeev<sup>{8}</sup>, Hui Cao<sup>{1}</sup>, Yu-Tsun Shao<sup>{2}</sup>, Piush Behera<sup>{9}</sup>, Lucas Caretta<sup>{9}</sup>, Woo Jin Kim<sup>{6}</sup>, Aarushi Khandelwal<sup>{6}</sup>, Megha Acharya<sup>{9}</sup>, Melody M. Wang<sup>{6}</sup>, Yin L

<sup>{1}</sup>Argonne National Laboratory, United States; <sup>{2}</sup>Cornell University, United States; <sup>{3}</sup>Lawrence Berkeley National Laboratory, United States; <sup>{4}</sup>North Carolina State University, United States; <sup>{5}</sup>Rice University, United States; <sup>{6}</sup>Stanford University, United States; <sup>{7}</sup>Université de Toulouse, France; <sup>{8}</sup>University of Arkansas, United States; <sup>{9}</sup>University of California, Berkeley, United States; <sup>{10}</sup>University of California, Berkeley, Lawrence Berkeley National Laboratory, United States

### **PiezoMEMS Materials & Devices**

7/27/2023 10:00 AM - 7/27/2023 12:00 PM America/New York

Hope A

*Kathleen Coleman, U.S. Army Research Laboratory*

10:00 AM

### 4151: **Diamond FET and MEMS Devices (Invited)**

Yasuo Koide, Jiangwei Liu, Meiyong Liao, Masataka Imura

National Institute for Materials Science NIMS, China; National Institute for Materials Science NIMS, Japan

## Technical Program – Thursday, July 27<sup>th</sup>

10:30 AM

**4292: Applications and Performance of Lead Hafnate-Titanate Thin Films Grown by Atomic Layer Deposition**

Nicholas Strnad<sup>{1}</sup>, Glen Fox<sup>{2}</sup>, Troy Tharpe<sup>{3}</sup>, Ryan Knight<sup>{1}</sup>, Jeffrey Pulskamp<sup>{1}</sup>  
<sup>{1}</sup>DEVCOM Army Research Laboratory, United States; <sup>{2}</sup>Fox Materials Consulting, LLC, United States; <sup>{3}</sup>University of Florida, Oak Ridge Associated Universities, United States

10:45 AM

**4288: PZT piezoMEMS Foundry in the United States**

Joe Evans, Naomi Montross, Sean Smith, Robert Lopez, Scott Chapman, Mike McDaniel  
Radiant Technologies, Inc., United States

11:00 AM

**4364: Synthesis and Fabrication of Hafnium Zirconium Oxide (HZO) /Polyvinylidene Fluoride-Trifluoroethylene (P(VDF-TrFE)) Flexible Piezoelectric Composite Films**

Sepide Taleb, Miguel Badillo, Mónica Acuautila  
University of Groningen, Netherlands

11:15 AM

**4403: Quantifying Nanoscale Electromechanical Coupling (Invited)**

Liam Collins  
Oak Ridge National Laboratory, United States

### **PFM 5**

7/27/2023 10:00 AM - 7/27/2023 12:00 PM America/New York

Hope B

*Yachin Ivry, Technion – Israel Institute of Technology, Solid State Institute*

10:00 AM

**4256: Exploring Thermal Transport and Electrocaloric Effects in Ferroelectrics with Scanning Thermal Microscopy (Invited)**

Rebecca Kelly, Olivia Baxter, Fran Kurnia, Amit Kumar, J. Marty Gregg, Raymond G.P. McQuaid  
Queen's University of Belfast, United Kingdom

10:30 AM

**4022: Heat-Assisted Ferroelectric Reading for Scanning Nonlinear Dielectric Microscopy Probe Memory**

Yasuo Cho, Yoshiomi Hiranaga  
Tohoku University, Japan

## Technical Program – Thursday, July 27<sup>th</sup>

10:45 AM

### 4071: **Mechanical Switching of Ferroelectric Domains in PbZr<sub>0.2</sub>Ti<sub>0.8</sub>O<sub>3</sub> Investigated by Phase Field Simulations**

Kevin Alhada Lahbabi<sup>{2}</sup>, Ingrid Canero Infante<sup>{2}</sup>, Sara Gonzalez<sup>{2}</sup>, Bertrand Vilquin<sup>{1}</sup>, Pedro Rojo Romeo<sup>{1}</sup>, Damien Deleruyelle<sup>{2}</sup>, Brice Gautier<sup>{2}</sup>  
<sup>{1}</sup>École Centrale de Lyon, CNRS, INSA Lyon, Université Claude Bernard Lyon 1, CPE Lyon, CNRS, INL, France; <sup>{2}</sup>INSA Lyon, CNRS, Ecole Centrale de Lyon, Université Claude Bernard Lyon 1, CPE Lyon, INL, France

11:00 AM

### 4037: **Barkhausen Noise Observation in Thin Film Ferroelectrics**

Keisuke Yazawa<sup>{1}</sup>, Pape Jean Gueye<sup>{3}</sup>, Benjamin Ducharme<sup>{2}</sup>, John E. Blendell<sup>{3}</sup>  
<sup>{1}</sup>Colorado School of Mines, Materials Science Center, National Renewable Energy Laboratory, United States; <sup>{2}</sup>INSA Lyon, CNRS, Tohoku University, ELYTMAX, Japan; <sup>{3}</sup>Purdue University, United States

11:15 AM

### 4278: **Frequency Dependent Anomalous AC-Bias Mediated Switching Behaviour in Relaxor SBN: Resonant Amplification Amid Pinning Potentials**

Niyorjyoti Sharma<sup>{2}</sup>, Nathan Black<sup>{2}</sup>, Joseph Guy<sup>{2}</sup>, Serene Pauly<sup>{2}</sup>, Kristina M. Holsgrove<sup>{2}</sup>, Eftihia Barnes<sup>{1}</sup>, Brian Rodriguez<sup>{3}</sup>, J. Marty Gregg<sup>{2}</sup>, Raymond G.P. McQuaid<sup>{2}</sup>, Amit Kumar<sup>{2}</sup>  
<sup>{1}</sup>Los Alamos Laboratory, United States; <sup>{2}</sup>Queen's University of Belfast, United Kingdom; <sup>{3}</sup>University College Dublin, Ireland

11:30 AM

### 4310: **Mask or Enhance: Data Curation Aiding the Discovery of Piezoresponse Force Microscopy Contributors**

Kevin Gardy Ligonde<sup>{1}</sup>, Kerisha Williams<sup>{1}</sup>, Iaroslav Gaponenko<sup>{3}</sup>, Nazanin Bassiri-Gharb<sup>{2}</sup>  
<sup>{1}</sup>Georgia Institute of Technology, United States; <sup>{2}</sup>Georgia Institute of Technology G.W. Woodruff School of Mechanical Engineering, United States; <sup>{3}</sup>University of Geneva, Switzerland

11:45 AM

### 4315: **Ferroelectric-gated Quantum Memory Device**

Maria Badarne,<sup>1,2</sup> Mohammad Suleiman,<sup>1,2</sup> Martin F. Sarott,<sup>3</sup> Morgan Trassin<sup>3</sup> and Yachin Ivry<sup>1,2,\*</sup>  
<sup>1</sup> Solid State Institute, Technion – Israel Institute of Technology 320003 Haifa. Israel

## Technical Program – Thursday, July 27<sup>th</sup>

### Thursday Lunch

7/27/2023 12:00 PM - 7/27/2023 1:00 PM America/New York

*Hope Ballroom E*

### Plenary - UFFC Distinguished Speaker & Closing Ceremony

7/27/2023 1:00 PM - 7/27/2023 2:00 PM America/New York

Superior Ballroom DC

*Jon Ihlefeld, University of Virginia*

### 4400: **Take It to the Limit: a Story of Piezoelectric Materials and Devices for Extreme Conditions**

Andrew J. Bell

University of Leeds, United Kingdom

### Thursday Cultural Excursion

7/27/2023 4:00 PM - 7/27/2023 8:00 PM America/New York

Thursday excursion: Concert by the water (weather permitting). Please read the details on how to join. (4-8pm) time slot.