

CALL FOR PAPERS

ABSTRACTS DUE JANUARY 15, 2020

PAN AMERICAN CERAMICS CONGRESS AND FERROELECTRICS MEETING OF AMERICAS (PACC-FMAs 2020)

ORGANIZED BY:

The
American
Ceramic
Society
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Hilton Panama | Panama City, Panama | July 19-23, 2020

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PAN AMERICAN CERAMICS CONGRESS AND FERROELECTRICS MEETING OF AMERICAS (PACC-FMAs 2020)

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PAN AMERICAN CERAMICS CONGRESS TECHNICAL PROGRAM CHAIRS



Tatsuki Ohji
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FERROELECTRICS MEETING OF AMERICAS CHAIR

COUNTRY CHAIRS

North American program chair: Ricardo Castro, rhrcastro@ucdavis.edu

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Colombian program chair: Henry A. Colorado L., henry.colorado@udea.edu.co

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and Leonardo Curimbaba, leonardo@grupocurimbaba.com.br

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Peruvian program chair: Jhon Hartley, jhartley@celima.com.pe



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Visit ceramics.org/PACCFMAs
Select "Submit Abstract"
to be directed to the Abstract
Central website.

Abstract title and text character limit
(including spaces) is 1,500 characters.

If you have questions, please contact
Marilyn Stoltz at mstoltz@ceramics.org
or +1 614-794-5868

Tentative Schedule of Events

Sunday, July 19, 2020

Conference registration	3:30 – 7 p.m.
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Welcome reception	5:30 – 7 p.m.
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Monday, July 20, 2020

Conference registration	7 a.m. – 5 p.m.
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Opening awards ceremony & plenary session	8:30 – 11:30 a.m.
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Lunch/Technology fair	11:30 a.m. – 1 p.m.
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Concurrent technical sessions	1 – 5 p.m.
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Coffee break	3 – 3:20 p.m.
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Technology fair and poster session, including reception	5:30 – 7 p.m.
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Tuesday, July 21, 2020

Conference registration	7 a.m. – 5 p.m.
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Concurrent technical sessions	8:30 – 11:30 a.m.
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Lunch/Technology fair	11:30 a.m. – 1 p.m.
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Concurrent technical sessions	1 – 5 p.m.
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Coffee break	3 – 3:20 p.m.
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Wednesday, July 22, 2020

Conference registration	7:30 a.m. – Noon
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Concurrent technical sessions	8:30 a.m. – Noon
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Technology fair	8:30 a.m. – Noon
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Afternoon on own	Noon – 5 p.m.
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Conference dinner	7 – 9 p.m.
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Thursday, July 23, 2020

Conference registration	8:00 a.m. – Noon
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Concurrent technical sessions	8:30 a.m. – Noon
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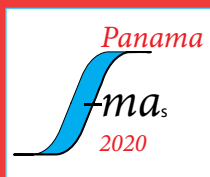
About the Pan American Ceramics Congress

During the last 50 years, wide-ranging and groundbreaking research, technology development, and commercialization in the field of ceramics and glass has taken place in

the Americas. These seminal contributions to design and engineering of ceramics and glasses for multifunctional properties led to their wide scale applications in energy, aerospace, healthcare, communication, infrastructure, transportation, environmental, and other industries. These technologies and systems led to significant improvements in living standards and quality of life for people from all over the world.

The goal of the Pan American Ceramics Congress is to bring together a wide variety of experts from academia, industries, research institutes, and laboratories to discuss current state-of-the-art and various technical challenges in research, development, engineering, manufacturing, and application of ceramic and glass materials. The Congress will provide a collegial forum for information exchange on current status and emerging trends in various technologies in the American continent (South and Central America, Canada, and the United States).

The technical program will consist of invited and contributed talks and poster sessions important to ceramic and glass professionals who live or do business in the Americas. It will provide an information exchange on the latest emerging technologies and facilitate open dialogue and discussion with leading experts from around the globe.



About the Ferroelectrics Meeting of Americas

The field of ferroelectrics, as well as related phenomena and novel electronic materials development, which introduced new cross-coupled effects like multiferroics and bioferroics

to the scientific community, are beginning to integrate with emerging science of the new era around the world. Due to various factors, it is especially important to accelerate such communications to the scientific community in the developing countries of the Americas. To facilitate and accelerate our objectives, we brought together representatives from several Central and South American countries working in areas of ferroelectrics and related materials research. With these goals in mind, a special society of ferroelectrics was formed that includes representatives from each country of the Americas as the members of the board (the FMAs board) to conduct a series of meetings, "Ferroelectric Meeting of Americas-FMAs." The meetings are held with regular frequency so researchers in this field can communicate, interact with each other, and develop cooperative and collaborative research programs in the Americas with other interested international partners in this research field.

The first board meeting was held at the International Meeting on Ferroelectricity (IMF 2017) in September 2017 in San Antonio, Texas, USA. Board members and participants from the countries of the Americas symbolized it as the first joint FMAs-1 and IMF 2017. In this context we had included ferroics-related research activities from the Americas and aimed to stimulate the research environment of ferroics-related collaborative research at various universities and institutes from the participating countries of the Americas.

Similar to the IMF series, the FMAs will provide a platform to bring together researchers from academia, industry, and government laboratories to share their knowledge in the field and to present the development of novel applications of ferroelectricity in various interdisciplinary & cross-coupled research areas. FMAs-2 will be held jointly with the Pan American Ceramics Congress.

The conference program may also include some special topical areas for interested participants. The peer reviewed and accepted papers presented at the meeting will be published in the special volume of *International Journal of Ferroelectrics*.

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TECHNICAL PROGRAM

1. Ceramics for Energy and Environment

This symposium invites abstracts in the general field of ceramics for energy and environment with emphasis on ceramics involved in energy generation, conversion and storage, and sustainable materials and technologies in a wide range of applications. Topics include, but are not limited to energy, environment, transportation, aerospace, building, and infrastructure. Both experimental and simulation approaches are welcome, along with fundamental and applied research. The symposium brings together the ceramics community to share advances in processing, characterization, properties, and modeling of ceramics for energy and environment.

Proposed session topics

- Ceramics for energy generation, conversion and storage
- Ceramics for environmental conservation and protection
- Energy, environment, transportation, aerospace, building and infrastructure applications
- Processing, characterization, properties, and modeling of ceramics for energy and environment
- Circular economy and climate change associated with ceramics and composites

Symposium organizers

Henry A. Colorado L., Universidad de Antioquia, Colombia,
henry.colorado@udea.edu.co

Mangalaraja Ramalinga Viswanthan, University of Concepcion, Chile,
mangal@udec.cl

Olivia Graeve, UCSD, USA

Gustavo Suarez, Argentina

Udayabhaskar Rednam, University of Concepcion, Chile

2. Advanced Ceramics and Composites

Advanced ceramics and composites are strategic materials in a wide range of industrial applications in the field of automotive, aerospace, electrical and electronic, and medical.

This symposium invites abstracts in the field of advanced or modern ceramics (oxides, non-oxides, and ceramic composites) for a wide range of applications including, but not limited to structural (mechanical), electrical and electronic, and biomedical. This section brings together ceramic engineers, scientists, and technologists to discuss and share advances and challenges in ceramic synthesis, processing, characterization, and properties.

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Proposed session topics

- Structural ceramics and ceramic matrix composites
- Ceramic coatings and thin films
- Electroceramics (piezo and ferroelectric ceramic composites)
- Ceramics for biomedical applications
- Novel synthesis and advanced ceramic processing
- Fabrication techniques of ceramic composites
- Advanced ceramics characterization/testing
- Processing-microstructure-properties-performance relationships
- Industrial applications of advanced ceramics and composites
- High- and ultra-high temperature ceramics

Symposium organizers

Mangalaraja Ramalinga Viswanthan, University of Concepcion, Chile, mangal@udec.cl

Carlos Maurício Fontes Vieira, Universidade Estadual do Norte Fluminense, Brazil

Ali Akbari-Fakhrabadi, University of Chile, Chile

Nicolas Rendtorff, Argentina

Oscar Jaime Restrepo Baena, Universidad Nacional de Colombia, Colombia

William Fahrenholtz, Missouri S&T, USA

3. Densification and Microstructural Evolution in Ceramics During Sintering

This symposium will address the latest developments in the consolidation and related microstructural evolution in ceramics by conventional and novel sintering processes in terms of their fundamental understanding, technological issues, and industrial applications. Sintering remains the most critical processing step to make ceramics with the desired microstructure and properties. This symposium will focus on tailoring the micro-structure and properties of ceramics by advanced sintering processes and the increasing ability to design complex and multifunctional materials. It will also cover all aspects of sintering of ceramics.

Proposed session topics

- Fundamental aspects of sintering
- Modeling and simulation of sintering at multiple scales
- Sintering of multi-material and multi-layer systems
- Microstructural evolution in sintering processes
- Novel sintering processes (e.g. field-assisted, laser, low temperature)
- Sintering phenomena in additive manufacturing
- Stress-assisted sintering (e.g. hot-pressing, hot isostatic pressing, sinter-forging)
- Sintering of nano-structured materials

Symposium organizers

Rajendra K. Bordia, Clemson University, USA, rbordia@clemson.edu

Ali Akbari-Fakhrabadi, University of Chile, Chile, aliakbarif@uchile.cl

Dachamir Hotza, UFSC, Brazil, d.hotza@ufsc.br

Héctor Camacho Montes, Mexico, Universidad Autónoma de Ciudad Juárez, Mexico, hcamacho@uacj.mx

Edgardo Benavidez, Argentina

Carlos Gonzalez Oliver, Argentina

4. Bioceramics and Biocomposites

The last few decades have witnessed significant progress in the use of ceramics for biomedical applications, with anticipated benefits in clinical diagnosis and treatment. In addition to conventional ceramic fabrication technologies, biomimetic processes are also being adopted to develop bio-inspired materials and inorganic-organic hybrids. The advent of nanotechnology and additive manufacturing has further increased the spectrum of applications of bioceramics and biocomposites.

This symposium will provide a platform to stimulate discussion among active researchers from academia/national labs, medical device manufacturers, entrepreneurs, and clinicians, who are involved in the development and use of bioceramics.

Proposed session topics

- Porous bioceramics
- Additive manufacturing of bioceramics
- Biomineralization and tissue-material interactions
- Bioactive and resorbable ceramics
- Bio-inspired, bio-synthetic, and biomimetic ceramics
- Self-assembled bioceramics
- Ceramics for drug and gene delivery
- Ceramics with bacteriostatic and bactericidal properties
- In vitro and in vivo biocompatibility of bioceramics
- Mechanical properties of bioceramics
- Orthopedic and dental applications of bioceramics
- Nanostructured bioceramics
- Magnetic nanoceramics for biomedical applications
- Light-emitting nanoceramics for bioimaging, sensing, and therapy
- Ceramic biosensors

Symposium organizers

Roger Narayan, North Carolina State University, USA, roger_narayan@outlook.com

Claudia Ossa, Universidad de Antioquia, Colombia

Miguel Prado, Argentina, Centro Atómico Bariloche, Argentina

Aldo Boccaccini, Germany



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5. Advances in Cements, Geopolymers, and Structural Clay Construction Materials

This symposium is about aluminosilicates or stoichiometric "geopolymers" (which convert to single phase ceramics upon heating), alkali activated cements and materials, phosphates, other chemically bonded inorganic compounds, and green cements. It also includes structural clay materials, green and alternative cements, and other construction materials.

Proposed session topics

- Geopolymers
- Green and alternative cements
- Phosphates and other inorganic analogues
- Geopolymer derived processing routes
- Waste materials to make geopolymers, cements, and construction materials
- Alkali activated cements and materials
- Waste encapsulation
- Sustainable materials

Symposium organizers

Waltraud (Trudy) Kriven, UIUC, USA, kriven@illinois.edu

Daniel Ribero, Grupo Corona, Colombia

Henry A. Colorado L., Universidad de Antioquia, Colombia

Edgardo Fabian Irassar, Facultad de Ingeniería–Universidad Nacional del Centro de la Provincia de Buenos Aires, Argentina

Flávio de Andrade Silva D.Sc., Pontifícia Universidade Católica do Rio de Janeiro (PUC-Rio), Brazil

Ruy A. Sá Ribeiro, INPA-National Institute for Amazonian Research/Structural Engineering Laboratory, Brazil

6. Refractories in The Americas

Extended lifetime, environmental restrictions, and new industrial processes demand higher quality of refractories. Therefore, new or alternative raw materials, manufacturing methods, and specific and enhanced properties of refractory materials are constantly being developed. These aspects of the refractory technology will be discussed in the symposium from the viewpoints of refractory producers, users, and academia from different countries of the Americas.

Topics focus on shaped and monolithic refractory materials used in different industries (metallurgy, petrochemical, glass, cement, etc.), including raw materials, binding systems, new products development, Industry 4.0 manufacturing methods, application of sensors and artificial intelligence, installation processes, testing/evaluation of refractory properties, and analysis of wear and/or failure. Issues related to environmental protection and modelling or simulation of properties and processes are also included.

Proposed session topics

- Raw materials, binding systems, and specialty additives
- Industry 4.0 modelling and simulation
- Improved testing and analysis methods
- Thermo-mechanical and chemical wear case studies and analysis
- Environmental controls, recycling, and reduced carbon footprint

Symposium organizers

Dana Goski, Allied Mineral Products, USA, dana.goski@alliedmin.com

Analia Tomba, Argentina

Edgardo Benavidez, Argentina

7. Science and Technology of Glasses, Glass Ceramics, and Optical Materials

This symposium provides a broad forum for the exchange and discussion of current issues in the science and technology of glasses, glass ceramics, and optical materials in general. The symposium will cover recent theoretical and experimental advances in fundamental and applied glass sciences, novel glass and glass-ceramic synthesis, processing and characterization, structure-processing-properties correlations, and optical device development. The symposium also aims at attracting a broader audience for discussions on emerging technological applications of materials spanning over the disordered-ordered structural spectrum. Topics of interest include, but are not limited to, advanced structural characterizations of glasses, glass transition and relaxation, nucleation and controlled crystal growth in glass ceramics, atomistic scale simulations, structure-property correlations, new functionalities and novel applications of amorphous materials in general. Of special interest are materials that can be employed in integrated optical systems, specifically addressing how bulk material properties can be translated, through modern manufacturing routes, to planar and fiber form. Contributions from the academic and/or industrial segments that address recent advances and new applications are highly welcomed.



Proposed session topics

- Glass structure; from nanoscopic to macroscopic properties
- Simulation of glass structure and dynamics
- Novel glass formulations and manufacturing methodologies
- Spectroscopic characterization of glasses, glass ceramics and general optical materials
- Bioglasses and bioactive optical materials
- Composites and doped optical materials
- Novel optical materials for new and multiple functionalities
- Materials for functional photonic devices
- Chalcogenide and non-oxide glasses
- Glass ceramic synthesis, processing and applications
- Material manufacturing methods for new optical applications

Symposium organizers

Andrea Simone Stucchi de Camargo, CeRTEV, São Carlos Institute of Physics - USP, Brazil, andreasc@ifsc.usp.br

Kathleen Richardson, University of Central Florida, USA, kcr@creol.ucf.edu

Marcelo Nalin, CeRTEV, Chemistry Institute, UNESP, Brazil

8. Novel, Green, and Strategic Processing and Manufacturing Technologies

The properties and performance of materials largely depend on their processing and manufacturing routes. Recently developed new processing and manufacturing technologies of ceramic materials and systems give us unique properties which cannot be achieved from conventional routes. On the other hand, we should take into account at least two critical issues in making materials and products. One is that the technologies are “green” or environmentally benign so as to avoid generation of elements and compounds hazardous to human health and environments and to protect the global environment by preserving energy during fabrication. The other is that they are “strategic” or using no or less quantity of rare natural resources for stable production. Keeping these aspects in view, the aim of this symposium is to discuss advances in processing and manufacturing technologies for a wide variety of ceramics and advanced materials.

Proposed session topics

- Green manufacturing processes with lower environmental burden
- Advanced sintering technologies (microwave sintering, FAST, SPS, FLASH, etc.)
- Novel forming and shaping technologies
- Materials recycling for ceramic manufacturing
- Alternatives for rare metals and materials
- Room/low-temperature synthesis
- Advanced powder synthesis and processing
- Aqueous synthesis and processing, colloidal processing
- Porous and cellular ceramics
- Advanced composite manufacturing technologies, hybrid processes
- Joining, integration, machining, repair, and refurbishment technologies
- Additive manufacturing of ceramics

Symposium organizers

Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST), Japan, t-ohji@aist.go.jp

Andrea Camerucci, INTEMA, Argentina

Mrityunjay Singh, Ohio Aerospace Institute, USA

Reginaldo Muccillo, USP

Eugene Medvedovski, Endurance Technologies Inc., Canada

Mariano Talou, Argentina

Shawn Allan, Lithoz America LLC, USA

Barbara Bermudez, Universidad Autonoma Nueva Leon, Mexico

9. Symposium for Young Professionals

The Symposium for Young Professionals brings together the younger research community in the fields of ceramics and glass-based materials to discuss challenges and new applications of these materials. Given the high demand of these materials for a diversity of applications, the multidisciplinary network among young researchers is the best way to generate high impact technologies. In this context, this symposium provides students and young researchers a platform to exchange experiences, knowledge, showcase their research, and strengthen their international network leading to innovative materials and novel applications. Early career professors, academic and non-academic researchers, Ph.D., master and undergraduate students as well as post-doctoral fellows from all countries in the Americas are encouraged to submit their abstracts.

Proposed session topics

- Alternative synthesis approaches for advanced ceramics and glass functional materials (composites, nanoparticles, microparticles, porous materials), green chemistry, low temperature approaches, sustainable use of resources, alternative heating methods
- Aeroespacial, armor applications
- Energy-related applications: solar energy, energy harvesting, energy management
- New biomedical applications: diagnosis, therapy, medical equipment development
- Rare-earth-based ceramics and glass-based materials: composites, nanoparticles, microparticles, porous materials
- Sensing materials: gas, pollutants, temperature, pressure sensors
- Technology development and translational research from laboratory to industry scale
- Global networking—challenges and changes for young scientists, accomplished scientists, and thinkers are also invited to influence the career development of young professionals

Symposium organizers

Emille M. Rodrigues, University of Ottawa, Canada, emartina@uottawa.ca

Daniele Benetti, INRS, Canada

Pablo Guardia Giros, IREC, Spain,

Artiom Skripka, INRS, Canada

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10. Ceramics for Sustainable Agriculture

Sustainability has emerged as an important component of fundamental and applied research. More particularly, biomass has emerged as is an important source of precursor materials for producing engineered materials for green energy, biomedical applications, paint, and food packaging. Cellulose, hemicellulose, and lignin are the important constituents of biomass. The symposium will focus on designing novel functional materials from biomass and innovative applications of ceramics in agriculture.

Proposed session topics

- Recycling and agricultural waste as precursors for functional ceramics
- Bioplastics and agricultural fibers, reinforced composites
- Ceramics for soil treatment, controlled release ceramics/glass for macro and micronutrients of plants, ceramics for soil fixation, immobilization of toxic elements, industrial wastes such as fly ash for soil treatment
- Biogeochemical reactions and biomineralization of ceramics and glass
- Modeling and simulation for reaction thermodynamics and kinetics, materials discovery by AI and machine learning
- Ceramics for water treatment/irrigation
- Ceramic membrane for water filtration, oil spill cleaning, wastewater treatment, corrosion inhibition of water supply system
- Sensors and piezoelectric materials to detect trace elements in soil and water

Symposium organizers

Surojit Gupta, University of North Dakota, USA, gsurojit1@gmail.com

Caue Ribeiro, Embrapa, Brazil

Manoj Mahapatra, University of Alabama, USA

Lan Li, Boise State University, USA

Andy Nieto, NPS, USA

11. Materials Approach to Art, Architecture, and Archaeology in the Americas

This symposium will cover a wide range of materials analyses applied on art, archaeology, and architecture. Topics of interest are non-invasive and micro-destructive techniques, reconstruction of technology, dating techniques, artifact sourcing, deterioration and conservation of cultural heritage materials, monitoring deterioration, and general technical studies. Topics related to the use of cultural heritage as a means to improve diversity in the field of materials science education are also welcome. This symposium is open to conservation scientists, archaeologists, conservators, and other professionals working with cultural heritage materials. Special consideration will be given to submissions related to the cultural heritage of the Americas.

Symposium organizers

Christina Bisulca, Detroit Institute of Arts, USA, cbisulca@dia.org

Darryl P. Butt, University of Utah, USA

Fumie Iizuka, University of California, Merced, USA

12. Special Symposium: Ceramics and Materials Education in the Americas

Invited speakers only

Education in materials science and engineering and especially in ceramics is critical to the continuation of the field and ensures that students are properly prepared. It is important to understand how education approaches differ throughout the region. Students and educators need to understand approaches and differences so they can move throughout the region, potentially attending or working at a university in another area.

This symposium will invite speakers to present overviews of the materials education process in their country or region. This can include university, college, technical or community college, and K-12 education. The speakers will identify strengths and any issues in their regions. Sharing approaches and solutions will benefit educators, students, and employers. Speakers will be given a set of general guidelines for their talks. There will also be a panel discussion at the end where the audience and speakers can discuss selected topics.

This symposium will be only one session. The topics in that session will include:

- University/college materials education
- Technician training
- High school/middle school education in materials
- Needs for specific training/topics in the region
- Industry participation in education
- Education for diversity and inclusion, humanitarian principles, etc.
- Training ceramic scientists and engineers with materials informatics, machine learnings, AI, and IoT

Each country chair will provide content for this symposium.

Symposium organizers

Sylvia M Johnson, Johnson consulting, NASA (retired), USA, sylviamjohnson@hotmail.com

Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST), Japan, t-ohji@aist.go.jp

PUBLISHING YOUR PAPER AT PACC-FMAs 2020

Submit your manuscript to the *International Journal of Ceramic Engineering and Science*, the official journal for the Pan American Ceramics Congress which replaces conventional Proceedings. IJCES is the ACerS-approved, open access journal of sound science and engineering studies, making it ideal for reporting the progress you presented at the Congress. The article processing charge for PanAm presenters is \$100 USD thanks to generous underwriting from The American Ceramic Society. Peer reviewed and accepted papers presented at the meeting dealing with the topic of ferroelectrics will be published in the special volume of *International Journal of Ferroelectrics*.

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Ferroelectrics Meeting of Americas (FMAs)

The topics covering all aspects of ferroelectrics, ferroics, multiferroics, and related multifunctional materials and devices will be covered but not be limited to:

- Theory, first principle calculations, phase transitions, and critical phenomena
- Growth of crystals, processing of materials and characterization, structure-property relationships, and thin films
- Domains and boundaries, surfaces and interfaces, imperfections, controlling and exploiting topological defects
- Dielectric, piezoelectric, pyroelectric properties
- Ferroelectric polymers, composites
- Probing the nanoscale ferroelectric behavior and size effects
- Order-disorder phenomena, ferroelectric relaxors
- Ferroics, bio-ferroics, multiferroics, bio-multiferroics, cross-coupled, and secondary ferroics
- Raman, IR, sub-millimeter, THz, microwave spectroscopy
- Ferroelectric-semiconductor integration
- Novelty of perovskites—single- phase ferroics, mixed oxides for energy harvesting, and superconductor oxides
- Simulation, modeling, and design of novel ferroics and meta-electronic materials
- Ferroelectrics by design—beyond serendipity
- Novel applications and device concepts using various ferroics and multiferroics for the applications in bio-components, multifunctional device concepts

Symposium organizers

Amar Bhalla, University of Texas at San Antonio, USA,
amar.bhalla@utsa.edu

Avadh Saxena, LANL, USA, avadh@lanl.gov

Jose A. Eiras, UFSao Carlos, Brazil, eiras@df.ufscar.br

Ruyan Guo, UTSA, USA, Ruyan.guo@utsa.edu

Related Organizational Activities:

Ivair A. Santos, UEM, Brazil

Ducinei Garcia, UFSC, Brazil

Marcelo Stachiotti, Argentina

Miriam Castro, Argentina

Nora Pellegrini, Argentina

Jesus Sequearia, Mexico

Elida de Obaldia, Panama

Melissa Montese, Panama

L.F.Cotica, UEM, Brazil

Jose S. Guerra, UFU, Brazil

For more information please visit:
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DOES YOUR COMPANY DO BUSINESS IN THE AMERICAS?

Participate in the Technology Fair at PACC-FMAs 2020.

An \$1,800 investment includes:

- Exhibit time from Monday through Wednesday
- A 6 foot table with two feet of space between tables (does not include an enclosed booth or stand)
- One complimentary registration to the PACC-FMAs 2020 conference
- Logo and company description on our website and the Technology Fair page in the conference program

Sponsorship opportunities are also available.

For more information, please contact Mona Thiel at 614-794-5834 or email mthiel@ceramics.org to reserve your space today.

