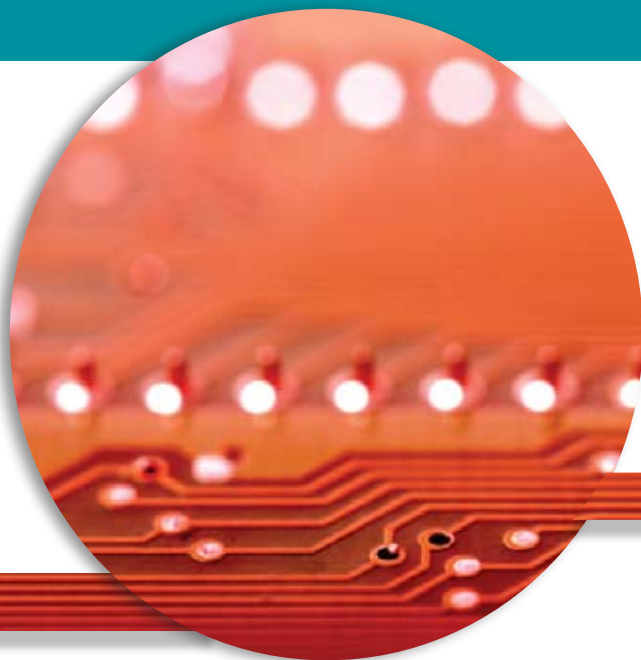


ELECTRONIC MATERIALS AND APPLICATIONS 2010



January 20-22, 2010

Royal Plaza in The Walt Disney® World Resort
Lake Buena Vista, FL, USA

Register Today!

Save \$100 if you sign up now.

www.ceramics.org/ema2010

Register Today!

2010 ORGANIZING COMMITTEE



Paul Clem
Electronics Division



Jacob L. Jones
Basic Science Division



Amit Goyal
Electronics Division

SCHEDULE

Wednesday, Jan 20, 2010

Opening Session	10:00 – 11:30 am
Future of Electronic Ceramics	11:45 am – 12:45 pm
Concurrent Technical Sessions	1:00 – 5:30 pm
Poster Session & Welcome Reception	6:00 – 8:00 pm

Thursday, Jan 21, 2010

Plenary Session	8:00 – 8:45 am
Concurrent Technical Sessions	9:15 am – Noon
Future of Electronic Ceramics	12:15 – 1:15 pm
Concurrent Technical Session	1:30 – 6:00 pm
Conference Dinner	7:00 – 9:00 pm

Friday, Jan 22, 2010

Plenary Session	8:00 – 8:45 am
Concurrent Technical Sessions	9:15 am – Noon
Future of Electronic Ceramics	12:15 – 1:15 pm
Concurrent Technical Sessions	1:30 – 4:45 pm

S1: ADVANCES IN CERAMIC PROCESSING, FORMING, AND SHAPING

Organizers: Wolfgang M. Sigmund, Univ. of Florida; Juan C. Nino, Univ. of Florida; Kristen Brosnan, General Electric Global Research Center; Edward M. Sabolsky, West Virginia Univ.

Description: Considerable scientific challenges remain for understanding fundamental aspects of ceramic processing technologies to meet demands in electronic applications. This symposium will focus on the advancement of understanding ceramic processing science, forming and shaping. Every aspect of processing science will be covered, from nanopowders to recent advances in sintering. Applications of electronic ceramics include actuators, solid oxide fuel cells, thermoelectrics, energy storage and conversion, sensors, power electronics and microwave dielectrics.

Sessions	Date	Time
Electrohydrodynamic Processing & Nanostructured Ceramics	20-Jan	1:45 – 3:15 pm
Powder Processing Science	20-Jan	3:15 – 4:45 pm
Thin Films & Microelectronic Processing	21-Jan	9:15 – 11:30 am
Forming and Sintering of Macroporous Ceramics & Composites	21-Jan	1:30 – 4:30 pm

S2: SYMPOSIUM ON ADVANCED DIELECTRIC, PIEZOELECTRIC, AND FERROIC MATERIALS, AND EMERGING FIELDS IN ELECTRONICS

Organizers: Amit Goyal, Oak Ridge National Lab; Shashank Priya, Virginia Polytechnic Institute and State Univ.; Dwight Viehland, Virginia Polytechnic Institute and State Univ.; Sahn Nahm, Korea Univ.; Pam A. Thomas, Univ. of Warwick

Description: This symposium will bring together researchers from academia and industry to present the latest advances in synthesis, modeling, and characterization of dielectric, piezoelectric, ferroelectric, and multiferroic materials. These materials have a



Electronic Materials and Applications 2010

tremendous impact on a variety of civilian and defense applications including tunable microwave devices, sonar transducers, memories, MEMS devices, high energy density capacitors, piezoelectric composites, energy harvesting, actuators, and sensors. Recent work on bridging phases in relaxor based perovskites, multiferroic heterostructures, lead-free piezoelectrics, composite thin films, flexoelectric effect, and fundamental materials science including computational and analytical modeling will be discussed. Other topics of interest include nanoscale domain phenomena, ferroelectric thin films, structure-property relationships, magnetoelectric composite structures, and electric field induced phase phenomena.

Sessions	Date	Time
Multiferroic Oxides, Heterostructures, and Thin Films I	20-Jan	1:00 – 5:15 pm
Lead-free Piezoelectrics I	21-Jan	9:15 – 11:45 am
Multiferroic Oxides, Heterostructures, and Thin Films II	21-Jan	9:15 am – Noon
Perovskite Dielectric, Mott Insulators, Ferroelectric, and Piezoelectric Materials	21-Jan	1:30 – 6:15 pm
Lead-free Piezoelectrics II	22-Jan	9:15 am – Noon
Nanoscale and Electromechanical Phenomena in Dielectric, Ferroelectric and Piezoelectric Materials	22-Jan	1:30 – 4:45 pm

S3: NANO PHENOMENA AND INTERFACIAL/SURFACE EFFECTS IN ELECTRONIC CERAMICS

Organizers: Quanxi Jia, Los Alamos National Lab; Jacob L. Jones, Univ. of Florida; Geoff Brennecke, Sandia National Labs; Brian Gorman, Colorado School of Mines; Amit Goyal, Oak Ridge National Lab; David Norton, Univ. of Florida

Description: Intentional control or manipulation of interfaces in electronic ceramics from atomic-, nano-, and/or micro-scales provides the possibility to design and fabricate materials with multifunctionalities or emergent behaviors unavailable in the bulk. Interfacing different materials for novel electronic devices has become the subject of many theoretical and experimental studies recently and is enabling a new design paradigm to produce novel functionalities that cannot be obtained in individual constituents. Experimental results have shown such functionalities in various electronic ceramics including ferroelectric, ferromagnetic, piezoelectric, multiferroic, electro-optic, and superconducting materials, to list a few. However, the sensitivity of processing, chemical stoichiometry, strain, and lattice distortions on the physical properties of the materials has also created enormous challenges to this community. This symposium will provide a forum for academic, industrial, and national Lab researchers to present and discuss the latest advances and fundamental research in the area of interfacial effects on the structural and physical properties of electronic ceramics. Novel approaches to composite materials, strain induced

enhancement of functionalities, nanostructuring, characterization of material properties and physical responses at the interface will be also emphasized.

Sessions	Date	Time
Probing and Characterizing the Interfaces I	20-Jan	1:00 – 3:15 pm
Probing and Characterizing the Interfaces II	20-Jan	3:15 – 5:30 pm
Interfacial/Surface Effects on the Physical Properties of Metal-oxide Films I	21-Jan	9:15 am – Noon
Interfacial/Surface Effects on the Physical Properties of Metal-oxide Films II	21-Jan	1:30 – 3:45 pm
Interfacial/Surface Effects on the Physical Properties of Metal-oxide Films III	21-Jan	3:45 – 5:45 pm

S4: SYMPOSIUM ON ENERGY HARVESTING AND SENSORS FOR STRUCTURAL HEALTH MONITORING

Organizers: Shashank Priya, Virginia Tech; Dan Inman, CEHMS, Virginia Tech; Paul Clem, Sandia National Labs; Roop Mahajan, Institute for Critical Technology and Applied Science, Virginia Tech; Thomas Daue, Smart Material Corp.; Michelle Bell, Radiant Technologies, Inc.

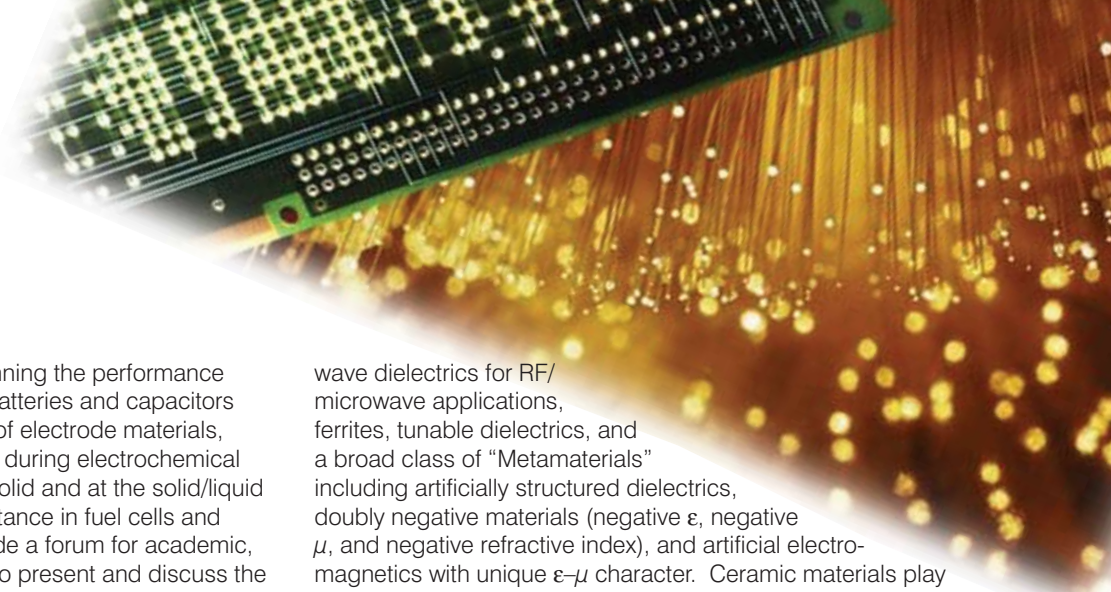
Description: Vast reductions in the size and power consumption of CMOS circuitry have led to focused research efforts on small and efficient power sources. Much of the current emphasis has been on developing on-site generators that transform an available environmental energy (light, kinetic, and thermal gradient) into electrical energy. This symposium will review past developments, current challenges and future goals in the field of energy harvesting and its application to structural health monitoring. Presentations in the symposium will concentrate on these topics: Energy Harvesting (piezoelectric, inductive, photovoltaic, electrets, radioactive and thermoelectric), and Structural Health Monitoring.

Session	Date	Time
Energy Harvesting and Health Monitoring	22-Jan	9:15 am – 1:15 pm

S5: FUNCTIONAL CERAMICS FOR ENERGY STORAGE & CONVERSION

Organizers: Wolfgang M. Sigmund, Univ. of Florida; Chris Apblett, Sandia National Labs; Y. Shirley Meng, Univ. of California-San Diego

Description: The performance of current energy conversion & storage technologies falls short of requirements for using electrical energy efficiently in transportation, commercial and residential applications. Ceramic materials have always played a critical role in energy conversion and storage, and they are facing greater challenges today to meet higher performance demand. Key materials



science and engineering issues underpinning the performance of the energy storage systems such as batteries and capacitors include crystal and electronic structures of electrode materials, phase stability and phase transformation during electrochemical processes, ionic diffusion in the bulk of solid and at the solid/liquid interfaces. Similar problems are of importance in fuel cells and photovoltaics. This symposium will provide a forum for academic, industrial, and national Lab researchers to present and discuss the latest advances and fundamental research in the area of functional ceramic materials for energy storage and conversion systems including batteries (primary and secondary) of different chemistries (Li-ion Mg-ion, NiMH etc.), supercapacitors and hybrids. Advances in computational/modeling aspects will also be emphasized.

Sessions	Date	Time
Energy Storage Systems & Electrolytes	22-Jan	9:15 – 11:00 am
Advanced Cathode Materials for Rechargeable Batteries	22-Jan	1:30 – 3:15 pm

S6: CERAMIC MATERIALS FOR POWER ELECTRONICS (WIDE-BAND GAP INTEGRATION, HIGH POWER CAPACITORS)

Organizers: Jon Ihlefeld, Sandia National Labs; Paul Clem, Sandia National Laboratories

Description: Efficient power electronics are in increasingly high demand to support electrical grid, transportation, and renewable power handling. Electronic ceramics and their integration with traditional semiconductor power devices have the potential to play a large role in this growing field. In particular, integration of ferroelectrics with wide bandgap semiconductors is an active and promising field of research. In addition, high energy density capacitors based on ceramics or polymer/ceramic nanoparticle composites show potential for significant increases in energy density for multiple applications in transportation and power electronics. This symposium will provide a forum for academic, industrial, and national Lab researchers to present and discuss the latest advances and fundamental research in the area of bulk, thick film, thin film and nanoparticle electronic ceramics for power electronic applications.

Sessions	Date	Time
Ceramic Materials for Power Capacitors	22-Jan	1:30 – 3:00 pm
Oxide Integration with Semiconductors for Power Electronics	22-Jan	3:00 – 4:30 pm

S7: METAMATERIALS AND MICROWAVE CERAMICS

Organizers: Paul Clem, Sandia National Labs; Amit Goyal, Oak Ridge National Lab

Description: The ability to develop artificially engineered dielectric materials has enabled a number of new phenomena attractive for communications, optics, and sensing. Among these are micro-

wave dielectrics for RF/microwave applications, ferrites, tunable dielectrics, and a broad class of "Metamaterials" including artificially structured dielectrics, doubly negative materials (negative ϵ , negative μ , and negative refractive index), and artificial electromagnetics with unique ϵ - μ character. Ceramic materials play unique roles in these systems, and are of particular interest for low loss properties and tunable behavior. This symposium is a forum for emerging electromagnetic phenomena, engineered materials design, structure-property relationships, and system performance in these highly engineered artificial electromagnetic structures.

Session	Date	Time
Metamaterials and Microwave Ceramics	21-Jan	1:30 – 5:30 pm

S8: THE FUTURE OF ELECTRONIC CERAMICS: A NEW INVESTIGATOR SYMPOSIUM

Organizers: Victoria Knox, Laura Burka, Jacob L. Jones, Univ. of Florida; Geoff Brenneka, Sandia National Labs

Description: Excellent student research is being conducted at universities in the United States and throughout the international community. However, there are few conferences or workshops where such research activities are highlighted. The New Investigator symposium will showcase both undergraduate and graduate research in the area of electronic materials and their applications. This symposium will also encourage innovation, collaboration, professional development, and continued involvement of students in The American Ceramic Society and throughout the ceramics community.

Sessions	Date	Time
Structural/Functional Relationships in Dielectrics	20-Jan	11:45 am – 12:45 pm
Fabrication of Composites and Emerging Materials	21-Jan	12:15 – 1:15 pm
Nanostructures and Interfaces	22-Jan	12:15 – 1:15 pm

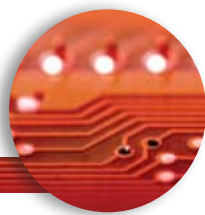
HOTEL INFORMATION

Royal Plaza in the Walt Disney® World Resort

1905 Hotel Plaza Boulevard
Lake Buena Vista, FL 32830
<http://www.royalplaza.com/>

Phone – 407-828-2828 Phone – 800-248-7890
Fax – 407-827-6338
Rate - \$149 single/double*

*Special Rate Ends: December 21, 2009



Electronic Materials and Applications 2010

Royal Plaza in the Walt Disney® World Resort
Orlando, Florida, USA | January 20-22, 2010



4 ways to register

Early Registration Deadline:
December 21, 2009

MAIL

The American Ceramic Society
L-2625, PO Box 600001
Columbus, OH 43260-2625 USA

FAX

1-301-206-9789
(Credit Cards Only)

WWW

www.ceramics.org
(Credit Cards Only)

PHONE

1-866-721-3322 U.S.
1-240-646-7054 Int'l.
(Credit Cards Only)

Please print

This is my work address home address school address

Member No. _____ First Name _____ M.I. _____ Last Name _____

Job Title _____ Dept. _____

Company/Affiliation/School _____

Street Address _____

City _____ State/Province _____ Postal Code _____ Country _____

Phone _____ Fax _____

E-mail _____

Billing Address

Same as Above

Address _____

City _____ State _____ Zip _____

Country _____

Registration

EMA 2010 Registration	EARLY REG. THROUGH DEC. 21	AFTER DEC. 21
Member [‡]	<input type="checkbox"/> \$525	<input type="checkbox"/> \$625
Member with 12 month membership renewal [‡]	<input type="checkbox"/> \$640	<input type="checkbox"/> \$740
Nonmember [‡] (with registration, nonmembers are given a free one-year membership in ACerS)	<input type="checkbox"/> \$640	<input type="checkbox"/> \$740
Emeritus/Senior [‡]	<input type="checkbox"/> \$395	<input type="checkbox"/> \$495
One Day: Member [‡]	<input type="checkbox"/> \$395	<input type="checkbox"/> \$495
One Day: Nonmember [‡] (with registration, nonmembers are given a free one-year membership in ACerS)	<input type="checkbox"/> \$510	<input type="checkbox"/> \$610
Material Advantage Student Member	<input type="checkbox"/> \$145	<input type="checkbox"/> \$195
Student: Not in Material Advantage	<input type="checkbox"/> \$180	<input type="checkbox"/> \$230
Companion (reception and conference dinner)	<input type="checkbox"/> \$105	<input type="checkbox"/> \$105

[‡] Select free division membership on top right

Note: All registrations includes coffee breaks, welcome reception, conference dinner.

Save 25% – register below for EMA2010 and 34th Int'l Conference & Expo on Advanced Ceramics & Composites!

EMA 2010 & ICACC'10 (January 24-29, 2010) Combined Registration

Member	<input type="checkbox"/> \$775	<input type="checkbox"/> \$875
Nonmember	<input type="checkbox"/> \$890	<input type="checkbox"/> \$990
Emeritus/Senior	<input type="checkbox"/> \$585	<input type="checkbox"/> \$685
Material Advantage Student Member	<input type="checkbox"/> \$210	<input type="checkbox"/> \$260
Student: Not in Material Advantage	<input type="checkbox"/> \$245	<input type="checkbox"/> \$295

GRAND TOTAL \$ _____ \$ _____

ACerS Membership[‡]

If you are not a member of a division, choose one free division affiliation below.

- Art Glass & Optical Materials
 Basic Science Nuclear & Environ. Tech.
 Cements Refractory Ceramics
 Electronics Structural Clay Products
 Engin. Ceramics Whitewares & Materials

Membership includes online access to *Journal of the American Ceramic Society*, *International Journal of Applied Ceramic Technology*, and the new *International Journal of Applied Glass Science*. Also includes print subscription and online access to *American Ceramic Society Bulletin*.

Payment

Check for \$ _____ enclosed.
(PAYABLE TO: THE AMERICAN CERAMIC SOCIETY. MUST BE IN U.S. DOLLARS AND DRAWN ON A U.S. BANK.)

Charge \$ _____ to my credit card:

- VISA MC AMEX

ACCT. NUMBER

EXP. DATE

NAME ON CREDIT CARD

SIGNATURE

Cancellation Policy: Full refund less \$50 if cancelled on or before December 21, 2009; 50% refund if cancelled between December 22, 2009 and January 19, 2010; no refunds after the start of the conference.

For Hotel Accommodations call the
Royal Plaza in the Walt Disney®
World Resort
1-800-248-7890 or 1-407-828-2828



The American Ceramic Society
600 N. Cleveland Ave., Suite 210
Westerville, Ohio 43082 USA

Register Today!

Sign up by Dec. 22 to save.

ELECTRONIC MATERIALS AND APPLICATIONS 2010

January 20-22, 2010

Royal Plaza in The Walt Disney® World Resort
Lake Buena Vista, FL, USA



Lake Buena Vista, FL, USA

Royal Plaza in The Walt Disney® World Resort

January 20-22, 2010

ELECTRONIC MATERIALS AND APPLICATIONS 2010

Registration!
Sign up now to
save \$100⁰⁰

