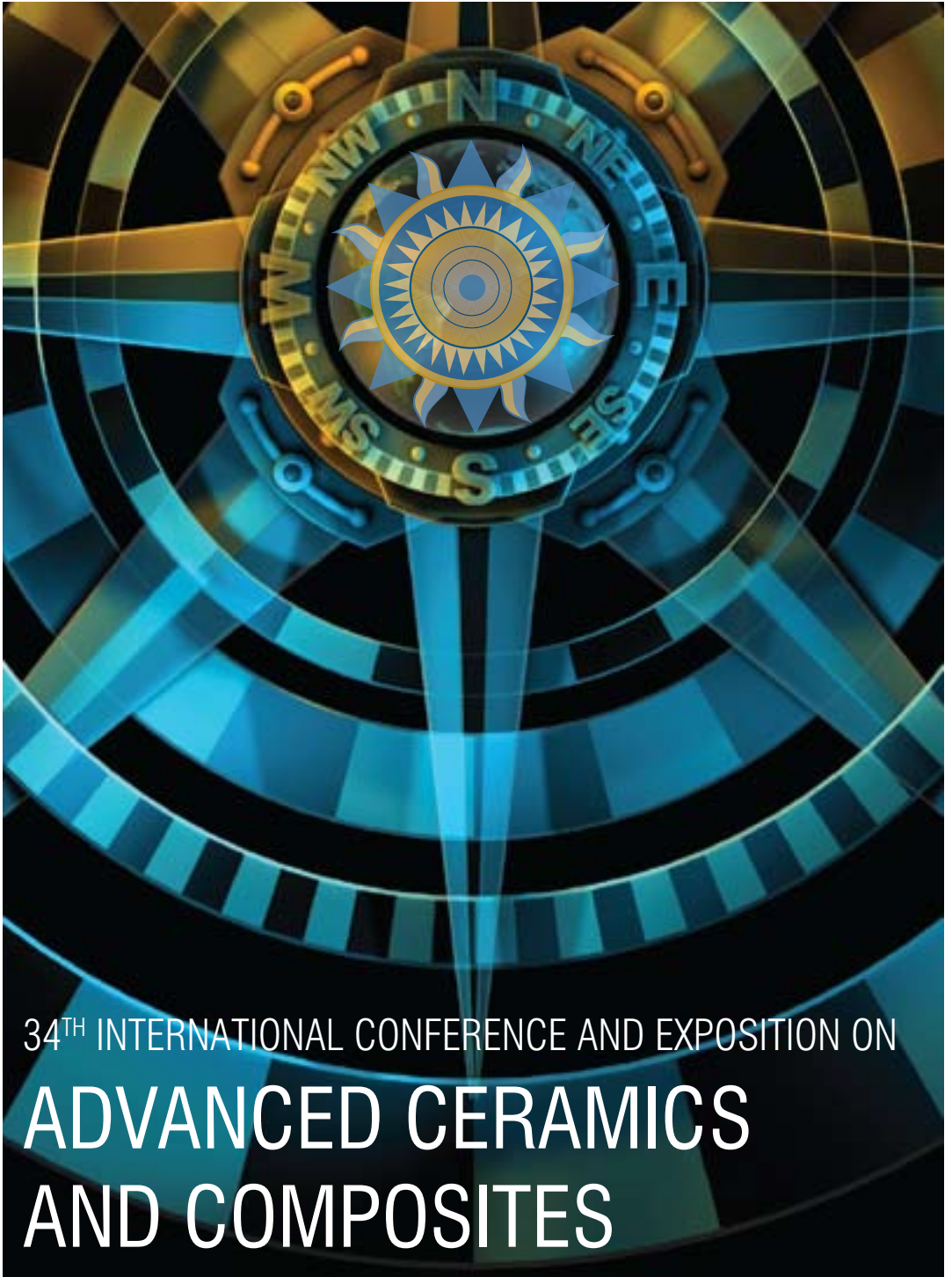


Hilton Daytona Beach
Resort & Ocean Center

Daytona Beach,
Florida, USA

January 24-29,
2010

Call for Papers Abstracts Due July 13, 2009

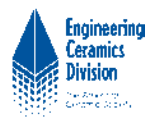


34TH INTERNATIONAL CONFERENCE AND EXPOSITION ON ADVANCED CERAMICS AND COMPOSITES

Organized by The American Ceramic Society and The American Ceramic Society's Engineering Ceramics Division



www.ceramics.org/daytona2010





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Introduction

The International Conference & Exposition on Advanced Ceramics & Composites (ICACC) is the most prominent international meeting in the area of advanced structural and functional ceramics, composites, and other emerging ceramic materials and technologies. This prestigious conference has been organized by ACerS Engineering Ceramics Division (ECD) and The American Ceramic Society since 1977. The 34th ICACC meeting will be held on January 24-29, 2010 in Daytona Beach, Florida and will consist of eleven Symposia and four Focused Sessions related to various aspects of advanced ceramics and composites.

The Symposium on Mechanical Behavior and Performance of Engineering Ceramics and Composites continues to be the cornerstone event, focusing on the underlying fundamentals of processing, microstructure, properties and performance of ceramics and composites. The meeting also includes symposia in the rapidly growing fields of ceramic sciences and technologies, such as Advanced Ceramic Coatings, Solid Oxide Fuel Cells, Armor Ceramics, Bioceramics, Nanostructured Materials & Nanotechnology, Advanced Processing & Manufacturing, and Porous Ceramics. These well established symposia provide an open forum for scientists, researchers and engineers from around the world to present and exchange recent advances on various aspects of the related ceramic science and technology. Several common themes and applications can be seen in some of the technological fields and thus joint sessions are planned between the Bioceramics, Nanostructured Materials, and Porous Ceramics symposia in 2010.

Three new symposia will debut in 2010. Advances toward the future of efficient electric energy and renewable energy technologies will be explored in the Symposium on Ceramics for Electric Energy Generation, Storage, and Distribution. Thermal Management Materials and Technologies will highlight the associated new materials and technologies, and will attract scientists and engineers in this field. Critical

developments in advanced ceramics sensors for various applications will be discussed in Advanced Sensor Technology, Developments and Applications.

Four exciting focused sessions are planned for ICACC 2010. One will be devoted to the growing field of Geopolymers and Other Inorganic Polymers. The remaining three focused sessions will make their first appearance at ICACC 2010. Global Mineral Resources for Strategic and Emerging Technologies address one of the most important issues in our future. Computational Design, Modeling, Simulation and Characterization of Ceramics and Composites will highlight recent progress of computational methodologies, which potentially can change every aspect of ceramic science and technology. Nanolaminated Ternary Carbides and Nitrides (MAX Phases) will discuss the latest advances in these phases, which currently attract considerable attention.

These symposia and focused sessions are listed in detail in this Call for Papers. The ECD Executive Committee and volunteer organizers hope you will submit an abstract and join us for ICACC 2010. We assure you that we will work hard to make our conference both beneficial and enjoyable. *See you in Daytona Beach, Florida in January 2010!*

ACERS ENGINEERING CERAMICS DIVISION LEADERSHIP

- **Trustee:** Mrityunjay Singh; OAI, NASA Glenn Research Center, USA; mrityunjay.singh-1@nasa.gov
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- **Chair-Elect:** Jonathan Salem; NASA Glenn Research Center, USA; jonathan.a.salem@nasa.gov
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- **Secretary:** Dileep Singh; Argonne National Lab, USA; dsingh@anl.gov

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Symposium 1: Mechanical Behavior and Performance of Ceramics & Composites

Structural ceramics and composites are finding applications in areas including energy generation, aerospace, automotive, and microelectronics. Long-term reliability is key in their ultimate use for a specific application. Correlations between processing and service conditions/environment to failure of ceramics by fracture, fatigue, or deformation are important aspects. Severe environments and challenging applications of ceramic materials have necessitated new approaches for characterization. This symposium will focus on the diverse aspects of mechanical behavior of ceramics and composites and their correlations to component performance and reliability.

Proposed Session Topics

- Processing - microstructure - mechanical properties correlations
- Ceramics & composites for energy/engine applications
- Ultra high temperature ceramics
- Functionally graded materials and systems with multi-functional properties
- Mechanical behavior of porous ceramics
- Mechanics, characterization techniques, & equipment
- Design, reliability, and life prediction modeling
- Fiber, matrices, and interfaces
- Environmental and radiation effects on mechanical properties
- Testing of joined ceramic and composite systems
- NDE of ceramic components

Symposium Organizers:

- Dileep Singh, Argonne National Lab, USA
- Monica Ferraris, Politecnico di Torino, Italy
- Michael Halbig, US Army VTD-NASA Glenn Research Center, USA
- Greg Hilmas, Missouri Univ. of Science & Technology, USA
- Osama Jadaan, Univ. of Wisconsin, USA
- Yutai Katoh, Oak Ridge National Lab, USA
- Jacques Lamon, Univ. of Bordeaux, France
- Edgar Lara-Curzio, Oak Ridge National Lab, USA
- Jonathan Salem, NASA Glenn Research Center, USA
- J. G. Sun, Argonne National Lab, USA
- Z. M. Sun, AIST, Japan
- James Webb, Corning Incorporated, USA
- Y. C. Zhou, Institute of Metal Research, Chinese Academy of Sciences, China
- Y. Zhou, Harbin Institute of Technology, China

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Symposium 2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications

This symposium will provide an open forum for researchers from around the world to discuss recent advances in coating

sciences and technologies, processing, microstructure and property characterization, and life prediction. Integrated structural, environmental properties and functionality through advanced coating processing and structural design are particularly emphasized.

Proposed Session Topics

- Thermal barrier coatings
- Environmental barrier coatings
- Coatings to resist wear, erosion and tribological loadings
- Damping coatings
- Abradable coatings
- Functionally graded coatings and materials
- Nanostructured and smart coating systems
- Advanced coating processing methods
- Multifunctional coatings and system integration
- Interface phenomena, adhesion and coating properties
- Advanced testing methods and non-destructive evaluation
- Modeling of coating degradation and life prediction

Symposium Organizers:

- Dongming Zhu, NASA Glenn Research Center, USA
- H. T. Lin, Oak Ridge National Lab, USA
- Uwe Schulz, German Aerospace Center, Germany
- Brian Hazel, GE Aviation, USA
- Yutaka Kagawa, Univ. of Tokyo, Japan
- Sophoclis Patsias, Rolls-Royce plc, UK
- Irene T. Spitsberg, Kennametal Inc., USA
- Dileep Singh, Argonne National Lab, USA
- Rodney W. Trice, Purdue Univ., USA
- Yong-Ho Sohn, Univ. of Central Florida, USA
- Ping Xiao, Univ. of Manchester, UK
- Robert Vaßen, Forschungszentrum Jülich GmbH, Germany
- Jing Xu, Baker Hughes INTEQ GmbH, Germany

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Abstract Submission Instructions

Visit www.ceramics.org/daytona2010 to review the session topics and select the “Submit Abstract” hyperlink to be directed to the Abstract Central website. Follow the prompts to create an account and submit your abstract online.

Please note that your member login and password will not work on this website. You will need to set up a new account login and password for the Abstract Central website. If you have questions, please contact Marilyn Stoltz at mstoltz@ceramics.org or 614-794-5868.

Submit Abstract today at www.ceramics.org/daytona2010

Symposium 3: 7th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

Recent progress in the SOFC systems development and demonstration range from portable power to automotive auxiliary power. Large research effort continues towards the development of coal based stationary power systems to logistic fuel operated silent power systems. SOFC technology advantages in terms of obtaining high electrical efficiency, lower emissions (green house gas, NO_x, VOC and particulate), utilization of liquid and gaseous hydrocarbon fuels and configurability to engineer products for stationary, mobile and defense applications are well known. R&D, products engineering and cost effective manufacturing development continues in North America, Europe, and Asia under the sponsorship of both private industries and government agencies. Although significant progress has been made in the areas of cell and stack materials identification, component fabrication, stack and systems design and simulation, fuel processing and systems operation on a wide variety of liquid and gaseous hydrocarbons, technology development continues towards the identification of bulk and interfacial modifications for performance enhancement, degradation minimization and cost reduction at both materials and process levels. Significant challenges exist in the areas of stacking cells, thermal management, and BOP component development at both sub-kWe and large multi kWe levels.

The primary purpose of this symposium will be to provide an international forum for scientists and engineers from these various sectors to present recent technical progress, and to exchange ideas and information, on various aspects of solid oxide fuel cells. The participants will gather state-of-the-art knowledge in the fields of SOFC component materials, processing, cell/stack fabrication and design, electrochemical performance and performance stability, bulk, interface and surface interactions, microstructural and interface engineering, computational simulation and modeling, test procedures and performance analysis, gaseous and liquid fuel processing, etc.

Proposed Session Topics

- Oxygen ion, proton and mixed conductors; conduction mechanisms, materials limitations, electrolytes for <400C applications
- Electrode materials and microstructural engineering; electrode processes and limitations
- Ceramic and metallic interconnects; degradation mechanisms, coatings, life prediction
- Sealing materials, designs and approaches; seal materials compatibility and interactions;
- Novel processing approaches for cell and stack materials
- Mechanical and thermal properties
- Electrochemical performance, performance enhancement and stability of cells and stacks
- Reliability and degradation
- Surface and interfacial reactions; materials transport and electrode poisoning; catalytic degradation
- Degradation modeling and computational simulation of cells and stacks; design for manufacturing
- Novel cell and stack designs (for example LT-SOFC, DC-SOFC etc)
- Fuel processing; supported/unsupported catalysts; carbon and sulfur fouling
- Applications

Symposium Organizers:

- Prabhakar Singh, Connecticut Global Fuel Cell Center, Univ. of Connecticut, USA
- Narottam P. Bansal, NASA Glenn Research Center, USA
- Tatsumi Ishihara, Kyushu Univ., Japan
- Tatsuya Kawada, Tohoku Univ., Japan
- Nguyen. Q. Minh, GE Power Systems, USA
- Mogens Mogensen, Risoe National Lab, Denmark
- Robert Steinberger-Wilckens, Forschungszentrum Jülich GmbH, Germany
- Jeffrey W. Stevenson, Pacific Northwest National Lab., USA
- Eric D. Wachsman, Univ. of Florida, USA
- Fatih Dogan, Missouri Univ. of Science & Technology, USA
- Masanobu Awano, AIST, Japan
- Alexander Michaelis, Fraunhofer IKTS, Germany

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Symposium 4: Armor Ceramics

U.S. military forces face an ever changing array of threats on the battlefield that continually requires the development of new materials to provide improved protection. Ceramic materials are, and will continue to be, an integral component of the armor systems developed to provide protection for air and ground vehicles as well as the individual soldier. This symposium will bring together researchers from industry, academia, and government organizations to address leading areas including those listed below.

Proposed Session Topics

- Transparent Materials
 - Transparent armor systems
 - Missile windows and radome applications
 - Impact resistant glass systems
 - Cost effective surface treatments
 - Adhesives
- Dynamic Behavior
 - Damage characterization
 - Inelasticity and failure mechanisms
 - Static and dynamic property testing
 - Shock wave/blast effects
- Surface effects
- Impact, Penetration, and Material Modeling
 - Particle mechanics
 - Multi-scale
 - Micro- and meso-structural
 - Incorporation of flaws and inelasticity mechanisms
- Boron Carbide
 - Concepts
 - Processes
 - Characterization

Symposium Organizers:

- Jeffrey J. Swab, US Army Research Lab, USA
- Lisa Prokurat Franks, US Army TARDEC, USA
- William Cooper, Air Force Research Lab, USA
- Jerry LaSalvia, US Army Research Lab, USA
- Brian Leavy, US Army Research Lab, USA
- James McCauley, US Army Research Lab, USA
- David Stepp, US Army Research Office, USA
- Andrew Wereszczak, Oak Ridge National Lab, USA

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Symposium 5: Next Generation Bioceramics

Novel bioceramic materials are being developed that will provide improvements in diagnosis and treatment of medical and dental conditions. In addition, the development and use of bioinspired materials, biomimetic materials, and inorganic-organic structures has generated considerable scientific interest. This symposium will allow for discussion amongst the many groups involved in the development and use of bioceramics, including ceramic researchers, medical device manufacturers, and clinicians.

Proposed Session Topics

- Advanced processing of bioceramics
- Biom mineralization and tissue-material interactions
- Bioinspired and biomimetic ceramics
- Self-assembled ceramics
- Ceramics for drug delivery and gene delivery
- In vitro and in vivo characterization of bioceramics
- Mechanical properties of bioceramics
- Medical and dental applications of bioceramics
- Nanostructured bioceramics (joint with Symposium 7)
- Porous bioceramics (joint with Symposium 9)
- Ceramic biosensors

Symposium Organizers:

- Roger Narayan, Univ. of N. Carolina, USA
- Chikara Ohtsuki, Nagoya Univ., Japan
- Saranjit S. Bhasin, Maulana Azad Medical College, India
- Suwan Jayasinghe, Univ. College London, UK
- Akiyoshi Osaka, Okayama Univ., Japan
- Markus Reiterer, Medtronic, USA

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Symposium 6: International Symposium on Ceramics for Electric Energy Generation, Storage, and Distribution

The significant increases in demand of world energy consumption as well as clean and efficient energy resources have prompted the imperative searches of new materials and technologies. The technologies aiming for efficient electric energy generation with zero-emission will require advances not only in the existing gas turbine systems and renewable energy resources, but also efficient energy storages and reliable electric power transmission systems. This symposium will focus on the advanced engineering ceramics and technologies that could help the global community to achieve the stated goals. A broad perspective is desired including advanced materials for energy harvesting and renewable energy generation; high-temperature ceramics and composites for energy efficiency and zero emission; high-temperature superconductor technologies for efficient electric power transmission; materials development and technologies for reliable and efficient electric and advanced thermal energy storage.

Proposed Session Topics

- Thermoelectric materials for energy harvesting
- Materials for thermionic and thermovoltaic applications
- Materials in advanced Li-ion batteries
- Materials of capacitive energy storage (supercaps)
- Materials for solar-thermal applications
- Novel design and strategies for energy storage
- Smart materials design through theory and modeling
- Ceramics and composites for stationary and distributed power generation systems
- Ceramics and composites for nuclear energy systems
- High-temperature superconductors

Symposium Organizers:

- H.T. Lin, Oak Ridge National Lab, USA
- Franziska Scheffler, Otto-von-Guericke - Universität Magdeburg, Germany
- Anke Weidenkaff, EMPA, Switzerland
- Tohru Sekino, Tohoku Univ., Japan
- Kuan-Zong Fung, National Cheng Kung Univ., Taiwan
- Kunihito Koumoto, Nagoya Univ., Japan
- Lidong Chen, Shanghai Institute of Ceramics, China
- Laifei Cheng, Northwestern Polytechnical Univ., China
- Hai-Doo Kim, Korea Institute of Materials Science, Korea

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Symposium 7: 4th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications

This symposium will focus on science and technology of nanostructured materials, with a strong focus on the elaboration of the practical side of nanotechnology. Besides approaches towards novel synthesis, functionalization, processing, and characterization of Nanomaterials, structure-property correlations at nanometer length scales and application of nanomaterials for photovoltaic, bio-medical, optical and sensing applications will form the major thrust areas. Contributions related to fabrication of nano-devices and challenges related to large-scale integration of functional nanostructures (nanowires and nanotubes) as well as industrial development of Nanomaterials will be given particular attention.

Proposed Session Topics

- Industrial development and application of nanomaterials
- Nanostructured membranes, thin films, functional coatings
- Synthesis, functionalization, processing and self-assembly of nanoparticles
- Nanotubes, nanorods, nanowires and other one-dimensional structures
- Bio-active nanomaterials and nanostructured materials for bio-medical applications
- Nanotoxicity and health aspects of engineered nanostructures
- Polymer nanocomposite technology and nanoporous materials
- Nanomaterials for photocatalysis, solar hydrogen and thermoelectrics
- Nanodevices: fabrication and large-scale integration
- Characterization and manipulation techniques for nanostructures

Symposium Organizers:

- Sanjay Mathur, Univ. of Cologne, Germany
- Suprakas Ray, CSIR- National Centre for Nanomaterials, South Africa
- Francisco Hernandez-Ramirez, Univ. of Barcelona, Spain
- Yasuhiro Tachibana, Osaka Univ., Japan
- Gunnar Westin, Angstrom Lab, Uppsala Univ., Sweden
- Kyoung Il Moon, KITECH, Korea
- Erica Corral, Univ. of Arizona, USA
- Mohammed Es-Souni, Univ. of Applied Sciences, Germany

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Symposium 8: 4th International Symposium on Advanced Processing and Manufacturing Technologies (APMT) for Structural and Multifunctional Materials and Systems

The properties and performance of structural and multifunctional materials largely depend on their processing and manufacturing routes. Manufacturing processes carefully designed with sufficient understanding of forming/sintering behaviors lead to reliable performance of components and products of large size and complex shapes. On the other hand, recently developed new processing and fabrication techniques of ceramic materials and systems give us unique properties which cannot be achieved from the conventional routes. The aim of this international symposium is to discuss global advances in the research and development of advanced processing and manufacturing technologies for a wide variety of non-oxide and oxide based structural ceramics, ultra high temperature ceramics and composites, particulate and fiber reinforced composites, and multifunctional materials, as well as their components. Current advances and state-of-the-art in various eco-friendly processing approaches will be covered. Advances in various processing and manufacturing technologies for fine scale MLCCs and transparent or electronic ceramic devices will also be presented.

Proposed Session Topics

- Binder and slurry technologies
- Room/low-temperature synthesis
- Novel forming/sintering technologies
- Microwave-or microwave assisted processing, SPS, reaction bonding
- Aqueous synthesis and processing, colloidal processing
- Polymer-based processing
- Rapid prototyping (robo-casting, etc)
- Patterning, templates and self assembly
- Micro-electronics devices and systems
- Novel characterization and imaging tools
- Design-oriented manufacturing and processing
- Green manufacturing; global environmental issues and standards
- Large scale/complicated shape processing
- Advanced composite manufacturing technologies, hybrid processes
- Joining, integration, and machining aspects

Symposium Organizers:

- Tatsuki Ohji, AIST, Japan
- Mrityunjay Singh, OAI, NASA Glenn Research Center, USA
- Jun Akedo, AIST, Japan
- Srinivasa Rao Boddapati, Kennametal Conforma Clad, USA
- Juergen G. Heinrich, Clausthal Univ. of Technology, Germany
- Byung-Koog Jang, National Institute for Materials Science (NIMS), Japan
- Soshu Kirihara, Osaka Univ., Japan
- Tomaz Kosmac, Josef Stefan Institute, Slovenia
- Walter Krenkel, Univ. of Bayreuth, Germany
- Eugene Medvedovski, Umicore Indium Products, USA
- Richard D. Sisson, Jr., Worcester Polytechnic Institute, USA
- Houzheng Wu, Loughborough Univ., UK

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Symposium 9: Porous Ceramics: Novel Developments and Applications

This symposium aims to bring together engineers and scientists in the area of ceramic materials containing high volume fractions of porosity, with porosity ranging from nano- to milli-meters.

Such solids commonly exhibit cellular architectures and they include foams, honeycombs, fiber networks, connected rods, connected hollow bodies, syntactic foams, bio-inspired structures, meso-porous materials and aerogels. Porous ceramics components are an essential part of numerous devices in various enabling engineering applications.

Papers are solicited on basic aspects of processing, characterization, modeling, properties evaluation and applications of these materials. Applications of considerable recent interest include hydrogen and energy-related technologies, sensors, catalysis supports (photo-catalysis, etc.), porous matrix fiber composites as well as hot gas filtration, in particular Diesel Particulate Filters (DPFs) and Emission Control. A session will be devoted to Porous Bioceramics, and will be conducted in conjunction with Symposium 5 (Next Generation Bioceramics).

Proposed Session Topics

- Innovations in processing methods for porous ceramics
- Structure and properties of porous ceramics
- Modeling of porous structures
- Microporous and mesoporous ceramics
- Porous ceramics for environmental applications
- Porous ceramics for energy applications
- Porous ceramics for biological applications
- Porous ceramics for functional applications

Symposium Organizers:

- Paolo Colombo, Univ. of Padova, Italy
- Sujanto Widjaja, Corning Incorporated, USA
- Aleksander J. Pyzik, The Dow Chemical Company, USA
- Michael Scheffler, Brandenburgische Technische Universitaet Cottbus, Germany
- Andreas Stein, Univ. of Minnesota, USA
- Thomas R. Watkins, Oak Ridge National Lab, USA
- Yuji Iwamoto, Nagoya Institute of Technology, Japan

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Colombo**

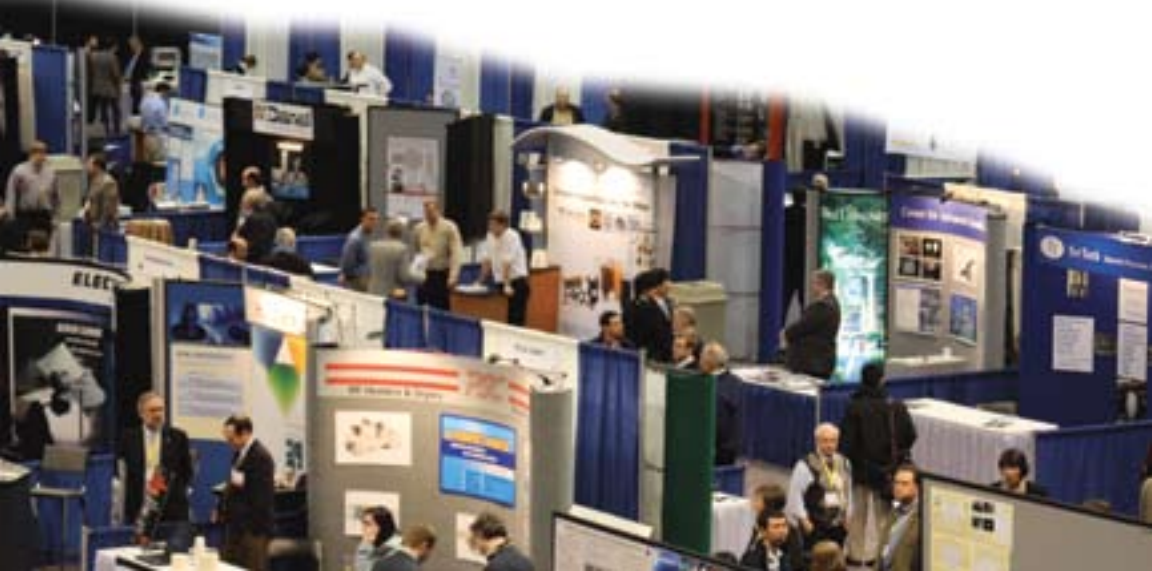
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Symposium 10: Thermal Management Materials and Technologies

Due to increased performance in a wide range of engineered products ranging from computer processors to advanced aerospace vehicles, there is a critical need for improved thermal management systems for transferring heat. The required enhancements include increased thermal conductivity, increased surface area, reduced weight/volume, as well as operability in harsh environments (e.g., durability under high flow rates, vibrations, stress, elevated temperatures, and oxidative environments). For example, improved thermal management is needed to increase the power density of electronics and more effectively cool electronic enclosures that are envisioned for future aircraft, spacecraft and surface ships. Typically, heat exchangers must increase in size in order to more effectively dissipate any increased heat loads. This is impossible in many cases, thus new materials and concepts for heat exchanger cores/systems are required. Another high profile application involves thermal protection systems (TPS) for aerospace vehicles (e.g., the reinforced carbon composite leading edge of the Space Shuttle). Future TPS systems will include a systematic approach where a temperature resistant, durable exterior composite skin is coupled with a combination of conductive and insulating core materials both of which will need to be capable of withstanding extreme environments.

The aim of this symposium is to discuss and highlight new materials and the associated technologies related to thermal management. Examples of these new enabling technologies include advanced materials such as high conductivity/large surface area core materials (e.g., graphite foams); light weight ultra-high conductivity sheet materials that perform structurally (e.g., 2D carbon/carbon or ceramic composites) or as heat sinks/spreaders (e.g., natural graphite/epoxy materials); insulating core materials (e.g., ceramic aerogels); and lastly, a slew of technologies that are required for system implementation.

Proposed Session Topics

- Design, development, and testing of aerospace thermal protection systems (TPS)
- Advanced composites for thermal protection systems (e.g., carbon/carbon and ceramic matrix composites, ablative materials, etc.)
- Harsh environment, light weight insulating materials (aerogels, foams, etc.)
- Light weight, high conductivity materials for thermal management (graphite and diamond, carbon and metallic foams, C/C and CNT composites, Al/SiC, BeO, Cu-based systems, etc.)
- Design, development, and testing of advanced heat exchangers, recuperators, etc.
- Bonding and integration technologies, thermal contact materials
- Nondestructive evaluation, quality assessment, structural health monitoring, sensors, etc.

Symposium Organizers:

- Andrew L. Gyekenyesi, OAI, NASA Glenn Research Center, USA
- Mrityunjay Singh, OAI, NASA Glenn Research Center, USA
- Sylvia M. Johnson, NASA Ames Research Center, USA
- Rajiv Asthana, Univ. of Wisconsin-Stout, USA
- Ajit K. Roy, Air Force Research Lab, WPAFB, USA
- Walter Krenkel, Univ. of Bayreuth, Germany
- Michiko Kusunoki, Nagoya Univ., Japan

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Symposium 11: Advanced Sensor Technology, Developments and Applications

This symposium will address advanced sensor technology. In recent years, demands for development and application of advanced sensing technology for many critical applications have increased.

Sensors are required in a wide range of applications, from power generation to aerospace, bio/medical, and material processing, etc. Research scope ranges from advanced materials development, micro-fabrication technology, sensor design, sensors and sensor networks, to sensor packaging. The symposium will bring together researchers from disciplines such as physics, chemistry, materials science, electronics, instrumentation, energy, bio, and space to highlight the latest developments and future challenges in this exciting interdisciplinary research field.

Proposed Session Topics

- High-temperature sensors
- Chemical sensors
- Physical sensors
- Semiconductor sensors
- Solid state ionic-based sensors
- Novel sensor materials
- Sensor packaging

Symposium Organizers:

- Linan An, Univ. of Central Florida, USA
- Ichiro Matsubara, AIST, Japan
- Xun Gong, Univ. of Central Florida, USA
- Ralf Moos, Univ. of Bayreuth, Germany
- Joan R. Morante, Univ. de Barcelona, Spain
- Yasuhiro Shimizu, Nagasaki Univ., Japan
- Qingming Wang, Univ. of Pittsburgh, USA
- Yiguang Wang, Northwestern Polytechnical Univ., China

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HOTEL INFORMATION



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Focused Sessions

Focused Session 1: Geopolymers and Other Inorganic Polymers

Geopolymers are a class of totally inorganic, aluminosilicate based ceramics that are charge balanced by group I oxides (e.g., Na, K, Rb, Cs). They are made under relatively ambient conditions of temperature and pressure into near-net dimension bodies, which can subsequently be converted to crystalline or glass-ceramic materials. They have some unique microstructures and properties, and a large variety of low to high tech potential applications. They are environmentally friendly and require low energy to make. This focused session also welcomes papers on other inorganic polymer analogues exhibiting similar behavior.

Proposed Session Topics

- Synthesis and processing
- Microstructure
- Porosity (nano-, meso-, micro-)
- Conversion to ceramics
- Mechanical properties
- Thermal shock resistance
- Coatings (fire resistant, acid resistant)
- Adhesive properties
- Waste encapsulation
- Construction materials
- Composites
- Novel applications
- Other inorganic analogues

Point of Contact:

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Focused Session 2: Global Mineral Resources for Strategic and Emerging Technologies

In this focused session the key role of the availability of essential mineral resources, above all of functional metals supplying conventional, strategic and emerging technologies are emphasized. Be it in communication technologies, be it in advanced energy technologies, the utilization of a vast range of different metals, alloys and metal oxides is indispensable. Mobile phones, computers and other microelectronic devices contain at least 50 different metals or metal compounds. But also emerging energy systems like lithium accumulators, novel photovoltaic materials, thermoelectric materials, LEDs, catalysts, etc. depend decisively on strategic mineral resources, above all specific metals. However, many of these essential commodities are scarce and/or only mined in very few locations. Competitive applications in different technologies aggravate this critical situation. Apart of comprehensive inventories analyzing the current status strategies for preventive and sustainable use as well as concepts for the substitution of strategic resources will be discussed. The Symposium is aimed at bringing together researchers from materials science, engineering, physics, chemistry, geology, economy, etc. for highlighting and evaluating this interdisciplinary, most actual and challenging topic.

Proposed Session Topics

- Substitution of ceramics for critical functional materials
- Strategic mineral resources for microelectronics
- Essential metals for regenerative energy technologies
- Design of technologies based on abundant resources
- Economic strategies for eco-efficient supply chains

Point of Contact:

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Focused Session 3: **Computational Design, Modeling, Simulation and Characterization of Ceramics and Composites**

Computational material science has become a rapidly growing area that changed every aspect of material science and technology in the past decades. Recent progress in the computational methodologies has significantly enhanced the efficiency in understanding of fundamental phenomena, improvement of material performance, optimization of processing, and design of new materials and devices. To facilitate the understanding, optimizing the behavior of ceramics and composites, and designing new ceramic materials or composites with controlled properties, this symposium will focus on design, modeling, simulation and characterization of ceramics and composites. A broad perspective is desired including prediction of complex crystal structure and phase stability, characterization of interfaces and grain boundaries at atomic scale, optimization of electrical, optical and mechanical properties, search of interface materials for ceramic composites, modeling of defects and related properties, design of materials and components at different length scales, application of novel computational methods for processing.

Proposed Session Topics

- Computer simulation/prediction of crystal structure, electronic structure and phase stability
- Modeling of defects and related properties
- Optimization of mechanical electrical, and optical properties
- Improvement of the performance of ceramics and composites
- Design of new ceramics and composites
- Characterization of interfaces and grain boundaries at atomic scale
- Search of interface materials for damage tolerant ceramic matrix composites
- Simulation/characterization of deformation mechanism of ceramics and composites at high temperatures
- Application of novel computational methods for processing

Focused Session Organizers:

- Yanchun Zhou, Institute of Metal Research, Chinese Academy of Sciences, China
- Michael J. Hoffmann, Univ. of Karlsruhe, Germany
- Wai-Yim Ching, Univ. of Missouri-Kansas City, USA
- Isao Tanaka, Kyoto Univ., Japan
- Julian D Gale, Curtin Univ. of Technology, Australia
- Goffredo de Portu, Institute of Science and Technology for Ceramics, Italy
- Omer van der Biest, Katholieke Universiteit Leuven, Belgium
- Yuichi Ikuhara, Univ. of Tokyo, Japan
- Lars Hultman, Thin Film Physics Division, Sweden
- Jochen Schneider, Aachen Univ., Germany
- Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences, China

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Yanchun Zhou

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Focused Session 4: Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

This focused session will bring together researchers and engineers to present the latest advances in synthesis, modeling, characterization and application of MAX phases – a class of ternary carbides and nitrides with nanolaminated structure and general formula $M_{n+1}AX_n$ (where M is an early transition metal, A is an A-group element from IIIA to VIA, X is either C or N, and $n=1, 2, 3 \dots$). The MAX phases have attracted recently a lot of attention because they possess unique combination of metallic- and ceramic-like properties. These carbides and nitrides exhibit high strength and stiffness even at high temperatures, good resistance to thermal shocks and oxidation, high thermal and electrical conductivities as well as high damage tolerance. They are also readily machinable. It is expected that the applications of this important class of ternary carbides may expand to different areas such as high-temperature structural, biomedical, and tribological applications.

Proposed Session Topics

- Processing of MAX phases and their composites
- Microstructural characterization of MAX phases
- Physical properties of MAX phases
- Mechanical and Tribological properties of MAX phases
- Biocompatibility property of MAX phase
- Modeling of thermodynamic stability, microstructure and physical properties of MAX phases

Focused Session Organizers:

- Miladin Radovic, Texas A&M Univ., USA
- Sylvain Dubois, Laboratoire de Physique des Matériaux, France
- Bikramjit Basu, Indian Institute of Technology Kanpur, India
- Yanchun Zhou, Institute of Metal Research, Chinese Academy of Sciences, China
- Zheng Ming Sun, National Institute of Advanced Industrial Science and Technology (AIST), Japan

Point of Contact:

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Tentative Schedule of Events

Sunday – January 24

Welcome Registration 5 PM – 7 PM

Monday – January 25

Opening Awards Ceremony
and Plenary Session 8:30 AM – 12 PM
Concurrent Technical
Sessions 1:20 PM – 6 PM

Tuesday – January 26

Concurrent Technical Sessions 8 AM – 6 PM
Exposition and Reception 5 PM – 8 PM
Poster Session A 5 PM – 8 PM

Wednesday – January 27

Concurrent Technical Sessions 8 AM – 6 PM
Exposition and Reception 5 PM – 7:30 PM
Poster Session B 5 PM – 7:30 PM

Thursday – January 28

Concurrent Technical Sessions 8 AM – 6 PM

Friday – January 29

Concurrent Technical Sessions 8 AM – 12 PM



Call for Papers Abstracts

Due July 13, 2009

www.ceramics.org/daytona2010

34TH INTERNATIONAL CONFERENCE AND EXPOSITION ON

ADVANCED CERAMICS AND COMPOSITES

Hilton Daytona Beach
Resort & Ocean Center

Daytona Beach,
Florida, USA

January 24-29,
2010

Organized by The American Ceramic Society and The American Ceramic Society's Engineering Ceramics Division



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