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35TH INTERNATIONAL CONFERENCE AND EXPOSITION ON
**ADVANCED CERAMICS
AND COMPOSITES**

Hilton Daytona Beach Resort & Ocean Center ♦ Daytona Beach, FL, USA ♦ Jan. 23-28, 2011

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



Call for Papers
Abstracts Due July 19, 2010

35TH INTERNATIONAL CONFERENCE AND EXPOSIT

Introduction

In the continuing tradition as the leading international meeting on advanced engineering and multifunctional ceramics, the 35th International Conference & Exposition on Advanced Ceramics & Composites (ICACC'11) will be held on January 23-28, 2011, in Daytona Beach, Florida. The American Ceramic Society's (ACerS) Engineering Ceramics Division (ECD) and ACerS have been organizing this prestigious conference since 1977.

Topical areas at this conference include advanced structural and functional ceramics, composites, and other emerging ceramic materials and technologies. ICACC'11 will consist of fourteen symposia and two focused sessions. These symposia and focused sessions will provide an open forum for scientists, researchers and engineers from around the world to present and exchange recent advances on various aspects related to ceramic science and technology.

The organization of the various symposia and focused sessions encompasses the diverse areas of ceramic science and technology, with particular attention to the proposed topics that address the current trends in research, engineering, and applications of advanced ceramics. Some of the well-established symposia at this conference are Mechanical Behavior and Performance of Ceramics and Composites, Advanced Ceramic Coatings, Solid Oxide Fuel Cells, and Armor Ceramics. The meeting also includes symposia on the emerging fields of Bioceramics, Nanostructured Materials & Nanotechnology, Advanced Processing & Manufacturing, and Porous Ceramics. In particular, the symposium on Advanced Processing & Manufacturing Technologies will be held in honor of Professor Katsutoshi Komeya for his innumerable contributions to the field. For the second year, three key symposia will be held addressing the current energy and environmental challenges: Ceramics for Electric Energy Generation, Storage, and Distribution; Thermal Management Materials and Technologies; and Advanced Sensor Technology: Developments and Applications.

Two new symposia: Materials for Extreme Environments: Ultrahigh Temperature Ceramics and Nanolaminated Ternary Carbides and Nitrides and Advanced Materials and Technologies for Rechargeable Batteries will be introduced at ICACC'11. The first symposium will address the significant recent interest in the design, processing, and characterization of ceramics and composites for extreme environments. The second symposium will focus on materials, materials/performance relationships, and failure mechanisms for rechargeable materials.

Further, a third symposium on Advanced Ceramics and Composites for Nuclear and Fusion Applications will provide a platform to discuss the recent advances and future directions in energy generation using nuclear technology. This symposium is held once every two years.

ICACC'11 will include two focused sessions that have attracted considerable attention in the past and will continue this year: Geopolymers and Other Inorganic Polymers and Computational Design, Modeling, and Simulation of Ceramics and Composites.

We are extremely pleased to announce that at ICACC'11, the first Pacific Rim Engineering Ceramics Summit will be held. This summit will bring together representatives from Engineering Ceramics divisions from Pacific Rim countries. It is expected that this summit will foster information exchange on the current status and emerging trends in various ceramic technologies.

Details of the symposia and focused sessions are listed in the Call for Papers. The ECD Executive Committee and volunteer organizers sincerely hope you will join us at ICACC'11 for a stimulating and enjoyable conference.

Dileep Singh

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ACERS ENGINEERING CERAMICS DIVISION LEADERSHIP

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Abstract Submission Instructions

Visit www.ceramics.org/daytona2011 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. If you submitted an abstract for ICACC'10 your account user ID and password will be emailed to you by April 15. Otherwise 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/daytona2011

ABSTRACTS DUE JULY 19, 2010

SYMPOSIUM ON ADVANCED CERAMICS AND COMPOSITES

Symposium 1: Mechanical Behavior and Performance of Ceramics & Composites

Structural ceramics and composites are finding applications in areas including energy generation, environment, space, transportation, and microelectronics. Long-term mechanical reliability is a key issue 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. Extreme environments and challenging applications of ceramic materials have necessitated new approaches for characterization. This symposium solicits abstracts related to the diverse aspects of mechanical behavior of ceramics and composites and their correlations to processing and component performance and reliability.

Proposed Session Topics

- Processing - microstructure - mechanical properties correlation
- Ceramics & composites for energy generation and environment
- Functionally graded materials and systems with multi-functional properties
- Polymer-derived composites
- Mechanics, characterization techniques & equipment
- Design, reliability, and life prediction modeling
- Micro-scale testing and applications
- Fiber, matrices, and interfaces
- Environmental effects on mechanical properties
- In situ characterization using x-rays & neutrons
- Testing of joined and integrated components and structures
- NDE of ceramic components
- Tribological performance of ceramics and composites

Symposium Organizers

- Dileep Singh, Argonne National Lab, USA
- Jonathan A. Salem, NASA Glenn Research Center, USA
- Jon Almer, Argonne National Lab, USA
- Shaoming Dong, Shanghai Institute of Ceramics, China
- Monica Ferraris, Politecnico di Torino, Italy
- Y. Zhou, Harbin Institute of Technology, China
- Michael Halbig, NASA Glenn Research Center, USA
- Greg Hilmas, Missouri Univ. of Science and Technology, USA
- Juergen Heinrich, TU Clausthal, Clausthal Univ. of Technology, Germany
- Andrew Wereszczak, Oak Ridge National Lab, USA
- J. G. Sun, Argonne National Lab, USA

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35TH INTERNATIONAL CONFERENCE AND EXPOSIT**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. Special sessions will be dedicated to advanced ceramic coating and component developments for aerospace, automotive, and energy applications. 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
- Advanced protective coating component systems for extreme environments
- Vibration damping coatings
- Functionally graded coatings and materials
- Nanostructured coating systems
- Thin-film photovoltaic device systems
- Advanced coating processing methods and modeling
- Advanced testing and non-destructive evaluation
- Multifunctional coating system integration and durability
- Interface phenomena, adhesion and coating properties
- 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

- Yutaka Kagawa, Univ. of Tokyo, Japan
- Rishi Raj, Univ. of Colorado at Boulder, USA
- David Marshall, Teledyne Scientific and Imaging Company, USA
- Irene T. Spitsberg, Kennametal Inc., USA
- Rainer Gadow, Univ. of Stuttgart, Germany
- Layo Ajayi, Argonne National Lab, USA
- Yong-Ho Sohn, Univ. of Central Florida, USA
- Jow-Lay Huang, National Cheng Kung Univ., Taiwan
- Robert Vaßen, Forschungszentrum Jülich GmbH, Germany
- Rodney W. Trice, Purdue Univ., USA
- Ping Xiao, Univ. of Manchester, UK
- Ming-Show Wong, National Dong Hwa Univ., Taiwan
- Jing Xu, Baker Hughes INTEQ GmbH, Germany

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Symposium 3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science, and Technology

SOFC power generation systems are currently being developed in watts to megawatt sizes for centralized and distributed stationary generation, automotive auxiliary power, man portable and unmanned applications. SOFC technology offers high electrical efficiency, lower emissions (green house gas, NO_x, VOC and particulate), utilization of liquid and gaseous hydrocarbon fuels and ease of products configurability. Research and development, products engineering and cost effective manufacturing remain focus of interest 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, component fabrication, stack and systems simulation and design, 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 is to provide an international forum for scientists and engineers to present recent technical progress, and to exchange ideas and technical 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 400°C -1000°C applications
- Electrode materials and microstructural engineering; tailored structure, electrode processes and limitations including defect chemistry modifications, analytical techniques
- Ceramic and metallic interconnects; degradation mechanisms, coatings, accelerated testing and life prediction, large scale manufacturing and cost reduction
- 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: electrical and structural reliability
- 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.), utilization of bio-derived fuels
- High temperature electrolysis – Water and CO₂
- Fuel processing; supported/unsupported catalysts; carbon and sulfur fouling, gas separation membranes
- Applications—Centralized and distributed generation, CHP, hydrogen production, portable and unmanned operations

Symposium Organizers

- Narottam P. Bansal, NASA Glenn Research Center, USA
- Prabhakar Singh, Connecticut Global Fuel Cell Center, Univ. of Connecticut, USA
- Mihails Kusnezoff, Fraunhofer IKTS, Germany
- J. S. Chung, POSTECH, Korea
- T. Horita, AIST, Japan
- Tatsumi Ishihara, Kyushu Univ., Japan
- Alexander Michaelis, Fraunhofer IKTS, Germany
- Nguyen Q. Minh, Consultant, USA
- Mogens Mogensen, Risoe National Lab, Denmark
- J. Obrien, INL, USA
- Robert Steinberger-Wilckens, Forschungszentrum-Julich GmbH, Germany
- Jeffrey W. Stevenson, Pacific Northwest National Lab, USA
- A. K. Suri, BARC, India
- Toshio Suzuki, AIST, Japan
- Eric D. Wachsman, Univ. of Maryland, USA

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35TH INTERNATIONAL CONFERENCE AND EXPOSITION**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 characterization tools and advanced materials with improved ballistic protection. Ceramic materials are, and will continue to be, an integral component of the many 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 areas critical to the development of armor ceramics that meet the necessary performance requirements.

Proposed Session Topics

- Nondestructive characterization
- High-rate real-time characterization
- Nanotechnology and microstructural design for enhanced armor ceramics
- Impact mechanics and phenomenology
- Multi-scale modeling
- Manufacturing

- James McCauley, U.S. Army Research Lab, USA
- Lisa Prokurat Franks, U.S. Army TARDEC, USA
- David Stepp, U.S. Army Research Office, USA
- Jeffrey J. Swab, U.S. Army Research Lab, USA
- Andrew Wereszczak, Oak Ridge National Lab, USA

Symposium Organizers

- James Campbell, U.S. Army Research Lab, USA
- William Cooper, Air Force Research Lab, USA
- Jerry LaSalvia, U.S. Army Research Lab, USA
- Brian Leavy, U.S. Army Research 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 nanostructured materials, bioinspired materials, biomimetic materials, and inorganic-organic structures has generated considerable scientific interest. This symposium will allow for discussion among 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
- Biomineralization and tissue-material interactions
- Bioactive and resorbable ceramics
- Bioinspired and biomimetic ceramics
- Self-assembled bioceramics
- Ceramics for drug 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 North Carolina, USA
- Chikara Ohtsuki, Nagoya Univ., Japan
- Bikramjit Basu, Indian Institute of Technology, India
- 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 of capacitive energy storage (supercapacitors)
- 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
- High temperature superconductors

Symposium Organizers

- H.T. Lin, Oak Ridge National Lab, USA
- Terry Tritt, Clemson Univ., USA
- Franziska Scheffler, Otto-von-Guericke-Universität, 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: 5th 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 coating, 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 Nanostructured materials 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 Sinha Ray, DST/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
- Mohammed Es-Souni, Univ. of Applied Sciences, Germany
- L.M. Manocha, Sardar Patel Univ., India

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35TH INTERNATIONAL CONFERENCE AND EXPOSITION**Symposium 8: 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT) in honor of Professor Katsutoshi Komeya**

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, particulate and fiber reinforced composites, and multifunctional materials, as well as their components and devices. 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.

This international symposium is being held in honor of Professor Katsutoshi Komeya, Yokohama National Univ., Japan, recognizing his outstanding contributions to science and technology of advanced structural and multifunctional ceramics and his tireless efforts in promoting their wide scale industrial applications.

Proposed Session Topics

- Novel forming/sintering technologies
- Microwave-or microwave assisted processing, SPS
- Aqueous synthesis and processing, colloidal processing
- Polymer-based processing
- Rapid prototyping, patterning, templates and self assembly
- Micro-electronics devices and systems
- Design-oriented manufacturing and processing
- Large scale/complicated shape processing
- Advanced composite manufacturing technologies, hybrid processes
- Joining, integration, machining, repair, and refurbishment technologies
- Green manufacturing; global environmental issues and standards
- Global mineral resources issues; geopolitics, and supply chain management
- Life cycle assessment, recycling, and reuse technologies

Symposium Organizers

- Tatsuki Ohji, AIST, Japan
- Mrityunjay Singh, OAI, NASA Glenn Research Center, USA
- Srinivasa Rao Boddapati, Kennametal Conformal Clad, USA
- Soshu Kirihara, Osaka Univ., Japan
- Tomaz Kosmac, Josef Stefan Institute, Slovenia
- Hejun Li, Northwestern Polytechnical Univ., China
- Eugene Medvedovski, Umicore Indium Products, USA
- Armin Reller, Univ. of Augsburg, Germany
- Richard D. Sisson, Jr., Worcester Polytechnic Institute, USA
- Junichi Tatami, Yokohama National Univ., Japan

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Tentative Schedule of Events**Sunday – January 23**

Welcome Reception 5 pm – 7 pm

Monday – January 24

Opening Awards Ceremony and Plenary Session 8:30 am – Noon

Concurrent Technical Sessions 1:20 pm – 6 pm

Tuesday – January 25

Concurrent Technical Sessions 8 am – 6 pm

Exposition and Reception 5 pm – 8 pm

Poster Session A 5 pm – 8 pm

Wednesday – January 26

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 27

Concurrent Technical Sessions 8 am – 6 pm

Friday – January 28

Concurrent Technical Sessions 8 am – Noon

Symposium 9: Porous Ceramics: Novel Developments and Applications

This symposium aims to bring together engineers, technologists and scientists in the area of ceramic (and glass-ceramics) materials containing high volume fractions of porosity, with porosity ranging from nano- to milli-meters. Such structures commonly exhibit cellular and high surface area architectures, and they include foams, honeycombs, fiber networks, connected rods, connected hollow bodies, syntactic foams, bio-inspired structures, micro- & meso-porous materials and aero-gels. Porous ceramics components are an essential and critical part of numerous structures and devices in various enabling engineering applications. Applications of considerable recent interest include hydrogen and energy-related technologies, sensors, catalysis supports (photo-catalysis, etc.), water purification, mass separation, and porous matrix fiber composites as well as hot gas filtration. Furthermore, research fields and advancement in emission control applications such as Diesel Particulate Filters (DPFs) and sorbent for mercury abatement continue to be of particular interests.

Papers are solicited on fundamental and novel aspects of processing, synthesis, characterization, modeling, properties evaluation and applications of wide range of porous ceramics. In addition, advancement in next generation porous ceramics, characterization tools and methods applicable to the understanding of materials and structures are also of interest. A specific session will be devoted to Porous Bioceramics, and will be co-organized in conjunction with Symposium 5 (Next Generation Bioceramics).

Proposed Session Topics

- Innovations in processing methods & synthesis of porous ceramics
- Structure and properties of porous ceramics
- Modeling and characterization of porous structures
- Micro-porous and meso-porous ceramics
- Porous ceramics for environmental applications
- Porous ceramics for energy applications
- Porous ceramics for biological applications
- Porous ceramics for functional applications
- Porous ceramics for emission control

Symposium Organizers

- Paolo Colombo, Univ. of Padova, Italy
- Sujanto Widjaja, Corning Incorporated, USA
- Andreas Stein, Univ. of Minnesota, USA
- Yu-Ping Zeng, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China
- Aldo Boccaccini, Univ. of Erlangen-Nuremberg, Germany
- Thomas R. Watkins, Oak Ridge National Lab, USA

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35TH INTERNATIONAL CONFERENCE AND EXPOSIT**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 and storing thermal energy. The required enhancements include increased thermal conductivity, increased surface area, reduced weight/volume, as well as operability in harsh 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. Furthermore, thermal energy storage devices (TESD) are seeing greater utilization in engineered products. TESP research associated with enhancing phase change materials (PCM) is of great interest (e.g., PCMs doped with nanoparticles for increased conductivity).

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); heat transfer nanofluids; insulating core materials (e.g., ceramic aerogels); joining technologies; thermal energy storage devices; phase change materials; 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.)
- Heat transfer nanofluids
- Thermal energy storage devices
- Phase change materials and associated technologies
- 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, Ohio Aerospace Institute, NASA Glenn Research Center, USA
- Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center, USA
- Dileep Singh, Argonne National Lab, USA
- Michiko Kusunoki, Nagoya Univ., Japan
- Rajiv Asthana, Univ. of Wisconsin-Stout, USA
- Ajit K. Roy, Air Force Research Lab, WPAFB, USA
- Walter Krenkel, Univ. of Bayreuth, Germany
- Tatsuki Ohji, AIST, Japan

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Symposium 11: Advanced Sensor Technology: Developments and Applications

This symposium will address advanced sensor technology based on ceramic materials. 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, including turbine engines, aerospace structures, bio/medical applications, material processing, structural safety monitoring, homeland security applications, 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, and instrumentation; as well as those who use sensors in energy, bio, space, buildings and etc, to highlight the latest developments and future challenges in this exciting interdisciplinary research field.

Proposed Session Topics

- Sensors for extreme environments
- Chemical sensors (including gas sensors)
- Physical sensors
- Bio-sensors
- Novel sensor materials and sensing concepts
- Sensor packaging

Symposium Organizers

- Linan An, Univ. of Central Florida, USA
- Michael Carpenter, Univ. of Albany, USA

- Xun Gong, Univ. of Central Florida, USA
- Andrei Kolmakov, Southern Illinois Univ. Carbondale, USA
- Alessandro Martucci, Università di Padova, Italy
- Ichiro Matsubara, AIST, Japan
- Qingming Wang, Univ. of Pittsburgh, USA
- Yiguang Wang, Northwestern Polytechnical Univ., China
- Chengying Xu, Univ. of Central Florida, USA

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Symposium 12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

Ultrahigh temperature ceramics (UHTCs) and nanolaminated ternary carbides and nitrides (MAX phases) are potential materials for use in extreme environmental applications such as engines, high fuel efficiency generators, hypersonic vehicles, and generation IV nuclear reactors. However, their thermal/chemical stability at high temperatures, long-term durability, thermal shock resistance, irradiation resistance, damage tolerance, and machinability into complex shapes/sharp edges, are critical issues limiting the application of these materials. Consequently, further research is needed to understand the multi-scale structure-property relationships; investigate new approaches for improving the thermal shock resistance, thermal/chemical stability, damage tolerance and machinability; and develop novel processing methods for bulk ceramics and coatings. This symposium will focus on design, processing, structure-property relationships, thermal and mechanical properties, oxidation resistance, machining and joining, and stability of UHTCs and MAX phases both from fundamental and application-oriented perspectives.

Proposed Session Topics

- Design and fundamental research of new material systems with fascinating properties
- Novel processing methods for UHTC and MAX phases (bulk, coatings and thin films)
- Structure-property relations and novel characterization methods;
- Methods for improving damage tolerance, oxidation and thermal shock resistance
- New methods for joining and machining of components;
- Structural stability under extreme environments (irradiation, ultrahigh temperature etc.)

Symposium Organizers

- Yanchun Zhou, Institute of Metal Research, Chinese Academy of Sciences, China

- Erica L. Corral, Univ. of Arizona, USA
- Joyce Deaver, NASA Glenn Research Center, USA
- Per Eklund, Linköping Univ., Sweden
- William G. Fahrenheitz, Missouri Univ. of Science and Technology, USA
- Miladin Radovic, Texas A&M Univ., USA
- Guo-Jun Zhang, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

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35TH INTERNATIONAL CONFERENCE AND EXPOSITION

Symposium 13: Advanced Ceramics and Composites for Nuclear and Fusion Applications

Ceramics and ceramic composites are considered indispensable for various advanced energy systems to operate efficiently, safely, cost-effectively, and environment-friendly. Nuclear reactors and fusion energy systems are not exceptions. This symposium provides a venue for materials scientists and nuclear engineers to discuss the opportunities and needs of advanced ceramics and composites in such energy systems, and current state of the art for science and technology of these materials ranging from materials design, processing, and properties to qualification and licensing. This symposium is also co-sponsored by ACeS Nuclear and Environmental Technology Division.

Proposed Session Topics

- Ceramic and carbon composites for high temperature reactors
- SiC ceramics and composites for fusion energy
- Ceramic for fuel coating and inert fuel matrix
- Materials for fusion plasma facing components
- ZrC and other alternative fuel coatings
- Graphite and carbon materials
- Radiation and environmental effects
- Fuel reprocessing and management of fission product elements
- Crystalline, amorphous and composite materials for waste immobilization
- Stress, operating temperature, and lifetime-limiting issues
- Material/composite design
- Test standards and design codes
- Joining and coating

Symposium Organizers

- Yutai Katoh, Oak Ridge National Lab, USA
- Kevin Fox, Savannah River National Lab, USA
- William Windes, Idaho National Lab, USA
- S.K. Sundaram, Pacific Northwest National Lab, USA
- Kumar Sridharan, Univ. of Wisconsin, USA
- Akira Kohyama, Muroran Institute of Technology, Japan
- Kazuhiro Sawa, Japan Atomic Energy Agency, Japan
- Tatsuya Hinoki, Kyoto Univ., Japan
- Jacques Lamon, INSA de Lyon, France
- Jochen Linke, Forschungszentrum Jülich, Germany
- Ping Xiao, Univ. of Manchester, UK
- Hans Hegeman, NRG Petten, The Netherlands

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HOTEL INFORMATION



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Government:	Prevailing Rate

Mention The American Ceramic Society to obtain the special rate. Reservations must be secured with a deposit equal to one night's room and tax. Individual reservations are refundable if cancelled up to 48 hours prior to arrival. Room rates are effective until **December 22, 2010** and are based on availability.

ABSTRACTS DUE JULY 19, 2010

SYMPOSIUM ON ADVANCED CERAMICS AND COMPOSITES

Symposium 14: Advanced Materials and Technologies for Rechargeable Batteries

Improvements in materials design, electrodes architecture, and cell chemistry are required to extend the life, enhance the safety, and lower the cost of rechargeable lithium-ion batteries, which are regarded nowadays as the most efficient energy storage systems for portable electronics, medical, military, renewable energy storage, smart grid, and transportation applications. A deeper understanding of the battery materials/property relationship, electrode/electrolyte interface phenomena, and cell failure mechanisms is also needed to face these challenges. The search for advanced high capacity electrode materials and the implementation of the very challenging lithium-sulfur and lithium-air batteries will be necessary to overcome the energy density shortfall in current lithium-ion batteries. Abstracts are solicited on the fundamental and applied aspects of rechargeable lithium-ion batteries, lithium-sulfur and lithium-air batteries, and beyond lithium technologies. This symposium will allow for discussion amongst the many groups involved in the development and use on these technologies.

Proposed Session Topics

- Advanced anode and cathode materials for lithium-ion batteries
- Materials design, screening, and electrode architectures for lithium-ion batteries
- Diagnostics and materials characterization for lithium-ion batteries
- Electrode/electrolyte interface characterization and modification for lithium-ion batteries
- Applications focused lithium-ion batteries
- Lithium metal-air battery technology
- Beyond lithium batteries, including sodium and multivalent cation batteries

Symposium Organizers

- Ilias Belharouak, Argonne National Lab, USA
- Mickael Badding, Corning, Inc, USA
- Marca Doeff, Lawrence Berkeley National Lab, USA
- Dominique Guyomard, Institut des Matériaux Jean Rouxel, France.
- Shirley Meng, Univ. of California San Diego, USA
- Jai Prakash, Illinois Institute of Technology, USA
- Dileep Singh, Argonne National Lab, USA
- Yang-Kook Sun, Hanyang Univ., Republic of Korea

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35TH INTERNATIONAL CONFERENCE AND EXHIBITION

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

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Focused Session 2:

Computational Design, Modeling, and Simulation of Ceramics and Composites

Recent progresses in the computational material science have significantly enhanced the efficiency in understanding of fundamentals of phenomena, improvement of material performance, optimization of processing, and design of new materials and devices. To facilitate the understanding and further optimizing the behavior of ceramics and composites, and designing new ceramics or composites with tailored properties, this symposium will focus on design, modeling, simulation and characterization of ceramics and composites. A broad perspective is desired including prediction of crystal structure and properties of new ceramics, materials design for extreme/harsh environments, characterization of new materials, interfaces and grain boundaries at atomic scale, materials design for optimization of performances, and application of novel simulation methods for material processing and performance.

Proposed Session Topics

- Novel simulation methods for materials processing and performance
- Prediction/simulation of crystal structure and properties of new materials
- Materials design for extreme environments, including applications for ultrahigh temperature, environmental, and thermal barrier coatings
- Search of new interface materials for ceramic matrix composites
- Optimization of mechanical, thermal, electrical, and optical properties
- Simulation/characterization of material behavior at high temperatures
- Characterization of new materials, interfaces and grain boundaries at atomic scale

Symposium Organizers

- Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences, China
- Wai-Yim Ching, Univ. of Missouri-Kansas City, USA
- Brian Good, NASA Glenn Research Center, USA
- Michael J. Hoffmann, Univ. of Karlsruhe, Germany
- Jian Luo, Clemson Univ., USA
- Katsuyuki Matsunaga, Kyoto Univ., Japan
- Hans J. Seifert, Technical Univ. of Freiberg, Germany
- Yanchun Zhou, Institute of Metal Research, Chinese Academy of Sciences, China

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CONFERENCE ON ADVANCED CERAMICS AND COMPOSITES

Pacific Rim Engineering Ceramics Summit

During the last fifty years, wide range ground breaking research, technology development, and commercialization in the field of engineering and functional ceramics took place in the Pacific Rim countries. These seminal contributions to design and engineering of ceramics for multifunctional properties, led to their wide scale applications in energy, aerospace, healthcare, communication, infrastructure, transportation, environmental, and other industries. These ceramic technologies and systems led to significant improvements in living standards and quality of life for people from all over the world.

This inaugural Pacific Rim Engineering Ceramics Summit is expected to bring together a wide variety of experts from academia, industries, research institutes/laboratories to discuss the current state of the art and various technical challenges in research, development, engineering, manufacturing, and application of ceramic materials. The goal of this summit is to provide a forum for the information exchange on current status and emerging trends in various ceramic technologies in the Pacific Rim countries. The technical program of the summit will cover wide ranging topics and identify

- Current trend and future directions for research and technology
- Challenges and opportunities for various ceramic technologies
- Energy and environmental issues and role of ceramics
- Ceramic education, training, and knowledge management
- Overview of major ceramics efforts in the region

The technical program of the summit will consist of invited and contributed presentations. We hope that this forum will serve as a global stage for the information exchange on the latest emerging ceramic technologies and facilitate open dialogue and discussion with leading experts.

Organizers

- **Mrityunjay Singh**, Trustee, Engineering Ceramics Division, The American Ceramic Society, USA
- **Hai-Doo Kim**, Chair, KECD, Korean Ceramic Society, Korea
- **Tatsuki Ohji**, Director and Engineering Ceramics Division Chair-Elect, Ceramic Society of Japan, Japan
- **Yu Zhou**, Vice President, Harbin Institute of Technology, Harbin, China
- **Jow-Lay Huang**, President, Taiwan Association for Coating and Thin Film Technology (TACT), Taiwan

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