37TH INTERNATIONAL CONFERENCE AND EXPOSITION ON

ADVANCED CERAMICS AND COMPOSITES

January 27–February 1, 2013 | Hilton Daytona Beach Resort and Ocean Center | Daytona Beach, Florida USA

Call for Papers

Abstracts Due July 18, 2012

The American Ceramic Society
www.ceramics.org

Engineering Ceramics Division
The American Ceramic Society

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

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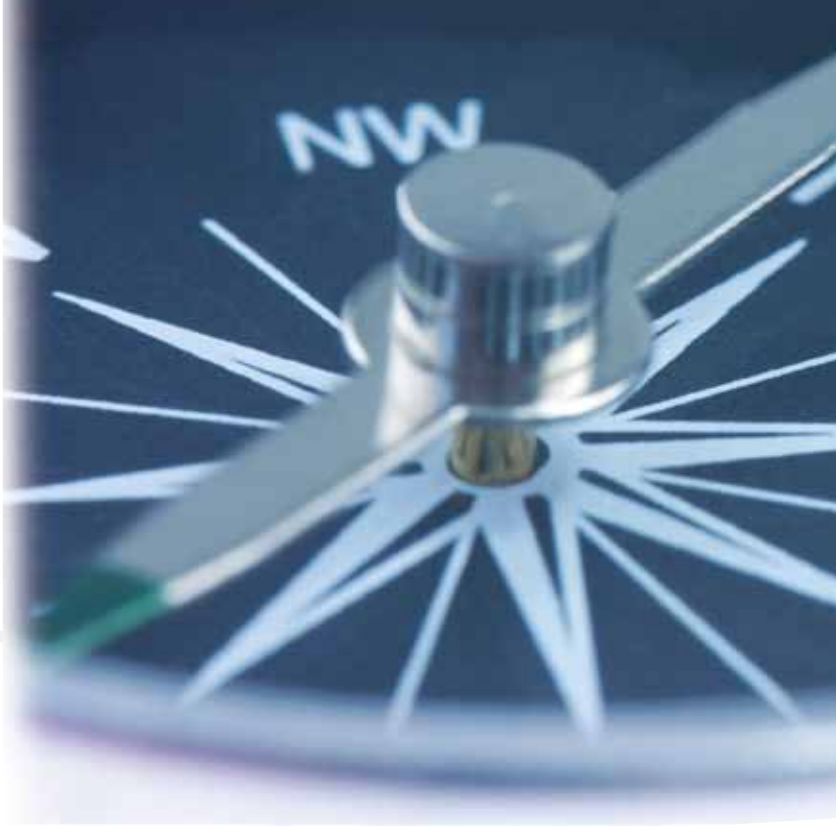
ABSTRACTS DUE ON JULY 18, 2012



INTRODUCTION

Continuing the successful tradition and accomplishment as the leading international meeting on advanced engineering and multifunctional ceramics, the 37th International Conference & Exposition on Advanced Ceramics & Composites will be held from January 27 – February 1, 2013 in Daytona Beach, Florida. The American Ceramic Society's Engineering Ceramics Division and ACerS have been organizing this prestigious conference since 1977 – with tremendous growth in interest and participation from ceramic communities globally.

Topical areas at this conference will include advanced structural and functional ceramics, composites, and other emerging ceramic materials and technologies. The technical program consists of 13 symposia, four focused sessions, the 2nd Global Young Investigator Forum and the Engineering Ceramics Summit of the Americas. These technical sessions – both oral and poster presentations – along with an Industry Exposition, will provide an open forum for scientists, researchers, engineers and industries from around the world to present and exchange findings on recent advances on various aspects related to ceramic science and technology.

ICACC'13 programming encompasses the diverse areas of ceramics and advanced composites, with particular attention to the current trends in research, development, engineering and application of advanced ceramics. The well-established symposia at this conference include Mechanical Properties of Engineering Ceramics and Composites, Advanced Ceramic Coatings, Solid Oxide Fuel Cells, Armor Ceramics, Bioceramics, Nanostructured Materials, Advanced Processing & Manufacturing Technologies, and Porous Ceramics. For the third year in row, two key symposia—Materials for Extreme Environments, and Materials and Technologies for Energy Generation and Rechargeable Energy Storage—will form part of the technical program. In addition, Ceramics and Composites for Sustainable Nuclear Energy and Fusion Energy will be organized and is co-sponsored by ACerS Nuclear and Environmental Technology Division.

ICACC'13 will include two new symposia: Computational Modeling and Next Generation Technologies for Innovative Surface Coatings. The technical program will include four Focused Sessions that have attracted considerable attention and interest: Geopolymers, Thermal Management Materials and Technologies, Nanomaterials for Sensing Application, and Ceramic Materials and Processing for Photonics and Energy.

Building upon the successful interactions and excitement generated from the 1st Global Young Investigator Forum at ICACC'12, the 2nd GYIF will be organized and facilitated by a group of our young researchers. Furthermore, we are pleased to announce that the 1st Engineering Ceramics Summit of the Americas will be held at ICACC'13. This summit will follow two very successful summits held in the previous years: Pacific Rim Engineering Ceramics Summit in 2011 and the EU-US Engineering Ceramics Summit in 2012. The goal is to provide a forum for the information exchange on current status and emerging trends in various ceramic technologies in South, Central and North America.

The ECD Executive Committee and volunteer organizers sincerely hope you will join us at ICACC'13 for a stimulating and enjoyable conference.

Sujanto Widjaja
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ACerS Engineering Ceramics Division Leadership

- Trustee: **Mrityunjay Singh**, Ohio Aerospace Institute, NASA Glenn Research Center, Cleveland, OH, Mrityunjay.Singh-1@nasa.gov
- Chair: **Dileep Singh**, Argonne National Laboratory, Argonne, IL, dsingh@anl.gov
- Chair-Elect: **Sanjay Mathur**, University of Cologne, Cologne, Germany, sanjay.mathur@uni-koeln.de
- Vice Chair/Treasurer: **Sujanto Widjaja**, Corning Incorporated, Palo Alto, CA, widjajas@corning.com
- Secretary: **Michael C. Halbig**, NASA Glenn Research Center, Cleveland, OH, michael.c.halbig@nasa.gov

www.ceramics.org/daytona2013

TENTATIVE SCHEDULE OF EVENTS

Sunday – January 27

Welcome Reception	5 p.m. – 7 p.m.

Monday – January 28

Opening Awards Ceremony and Plenary Session	8:30 a.m. – Noon
Concurrent Technical Sessions	1:30 p.m. – 6 p.m.

Tuesday – January 29

Concurrent Technical Sessions	8 a.m. – 5:20 p.m.
Exposition and Reception	5 p.m. – 8 p.m.
Poster Session A	5 p.m. – 8 p.m.

Wednesday – January 30

Concurrent Technical Sessions	8 a.m. – 5 p.m.
Exposition and Reception	5 p.m. – 7:30 p.m.
Poster Session B	5 p.m. – 7:30 p.m.

Thursday – January 31

Concurrent Technical Sessions	8 a.m. – 6 p.m.

Friday – February 1

Concurrent Technical Sessions	8 a.m. – Noon

Abstract Submission Instructions

Visit www.ceramics.org/daytona2013 to review the session topics and select the "Submit Abstract" hyperlink to be directed to the Abstract Central website.

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

SYMPOSIUM 1: Mechanical Behavior and Performance of Ceramics & Composites

Structural ceramics and composites have 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 key aspects of materials applications. 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 Symposium Topics

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

Symposium Organizers:

- Dileep Singh, Argonne National Laboratory, USA
- Jonathan A. Salem, NASA Glenn Research Center, USA
- Jon Almer, Argonne National Laboratory, USA
- Laifei Cheng, Northwestern Polytechnical University, China
- Shaoming Dong, Shanghai Institute of Ceramics, China
- Monica Ferraris, Politecnico di Torino, Italy
- Michael Halbig, NASA Glenn Research Center, USA
- Juergen Heinrich, TU Clausthal, Clausthal University of Technology, Germany
- Yutaka Kagawa, University of Tokyo, Japan
- Walter Krenkel, University of Bayreuth, Germany
- J. G. Sun, Argonne National Laboratory, USA
- Andrew Wereszczak, Oak Ridge National Laboratory, USA
- Y. Zhou, Harbin Institute of Technology, China

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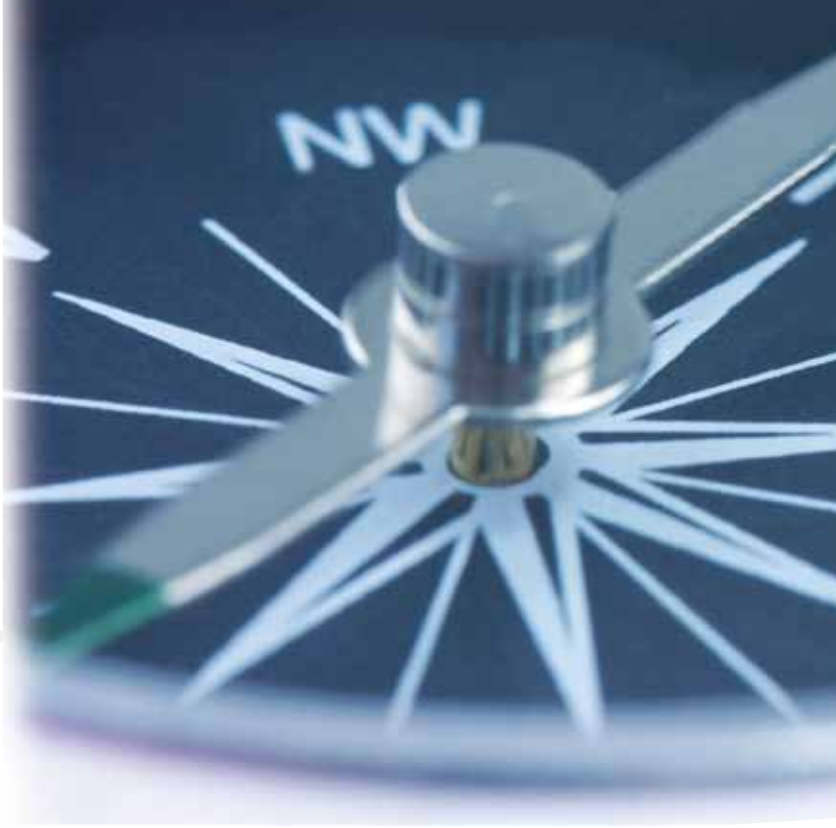

SYMPOSIUM 2: Advanced Ceramic Coatings for Structural, Environmental and Functional Applications

This symposium will provide an open forum for researchers to discuss recent advances in ceramic coating sciences and technologies, processing, microstructure and property characterization and life prediction. Special sessions will be dedicated to advanced coating and component developments for aerospace, automotive, and energy applications. Integrated structural, environmental properties and functionality through advanced coating processing and structural design are of particular interests.

Proposed SymposiumTopics

- Thermal barrier coatings
- Environmental barrier coatings
- Coatings to resist wear, erosion and tribological loading
- Protective coating and component systems for extreme environments
- Vibration damping coatings
- Functionally graded coatings and materials, nanostructured coating systems
- Low temperature coating systems (especially via wet chemical synthesis)
- Thin-film photovoltaic device systems
- Advanced coating processing methods and modeling, testing and NDE
- Multifunctional coating system integration and durability
- Interface phenomena, adhesion and coating properties
- Modeling of coating degradation and life prediction

Symposium Organizers:

- Jow-Lay Huang, National Cheng Kung University, Taiwan
- H. T. Lin, Oak Ridge National Laboratory, USA
- Dongming Zhu, NASA Glenn Research Center, USA
- Uwe Schulz, German Aerospace Center, Germany
- Yutaka Kagawa, University of Tokyo, Japan
- Irene T. Spitsberg, Kennametal Inc., USA
- Rainer Gadow, University of Stuttgart, Germany
- Layo Ajayi, Argonne National Laboratory, USA
- Yong-Ho Sohn, University of Central Florida, USA
- Robert Vaßen, Forschungszentrum Jülich GmbH, Germany
- Jinn P. Chu, National Taiwan University of Science and Technology, Taiwan
- Rodney W. Trice, Purdue University, USA
- Ping Xiao, University of Manchester, UK
- Ming-Show Wong, National Dong Hwa University, Taiwan

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SYMPOSIUM 3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

SOFCs offer potential for clean and efficient power generation from a wide variety of fuels ranging from hydrocarbons to renewables and coal derived fuels. Advanced systems configurations are currently being developed for applications in centralized and distributed stationary generation, automotive auxiliary power, man portable and unmanned operation. With demonstrated advantages of high electrical efficiency, lower emissions (greenhouse gas, SOx, NOx, VOC and particulate matters) and ease of products configurability, major focus of interest continues to be on systems research and development, products engineering and cost effective manufacturing under the sponsorship of government agencies and private industries. 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 progresses in SOFC and new challenges connected with temporary storage of renewable energies and grid stabilization has raised the interest to solid oxide electrolysis cells (SOEC) for hydrogen co-generation.

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 and solid oxide electrolysis.

Proposed Symposium Topics

- Electrolytes; oxygen ion, proton and mixed conductors; conduction mechanisms
- Electrode materials and microstructural engineering; electrode processes, defect chemistry, analytical techniques
- Ceramic and metallic interconnects; degradation mechanisms, coatings, accelerated testing and life prediction
- Sealing materials, designs and approaches; compatibility and interactions

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SYMPOSIUM 4: Armor Ceramics

Ceramic and glass materials are integral components in armor systems designed to give some level of protection to the individual soldier, air platforms, and ground vehicles against an array of ballistic threats. This symposium is an opportunity for scientists, engineers, and interested individuals from industry, academia, and government organizations to come together and discuss fundamental and applied issues concerning the development, characterization, testing and evaluation, behavior, modeling, and application of ceramic and glass materials for ballistic protection.

Proposed Symposium Topics

- Synthesis & Processing: conventional and novel, green body forming, densification, surface modification, planar and curved shapes with/without topological features
- Manufacturing: process scale-up, machining, quality control, cost-effectiveness
- Materials Characterization: chemistry, phases, microstructure, defects, flaws and flaw statistics, bulk, surface, microscopy, spectroscopy, non-destructive, residual stress
- Testing and Evaluation: conventional and fundamental ballistics, in-situ/real time and post-test characterization, nondestructive characterization, technique development, wear and erosion, thermal, fatigue, residual stress, life-cycle
- Quasi-static and Dynamic Behavior: mechanical properties, low & high-rate, high-pressure, shear, multi-stress state, shock, fracture, fragmentation, damage, inelastic deformation mechanisms, phase transitions, size-scale effects
- Modeling: material, system, analytical, computational, continuum, atomistic, multi-scale, thermodynamics, mechanics, phenomenological, physically-based, microstructural, damage, inelastic deformation mechanisms, phase transitions, fracture, fragmentation, impact, penetration, residual stress, homogeneous & heterogeneous deformation, failure, size-scale effects, novel numerical techniques
- Application: development of laminate systems, integration, fielding and in-service issues

Additionally there will be special focus topics, namely *Transparent Ceramics and Glasses*, and *Materials in Extreme Dynamic Environments*. The latter topic is a new Army program that seeks to de-

- Novel processing and design of cell and stack materials
- Mechanical and thermal properties, electrochemical performance and stability
- Electrical and structural reliability
- Surface and interfacial reactions; materials transport and electrode poisoning; catalytic degradation, carbon fouling
- Degradation modeling and computational simulation of cells and stacks
- High temperature electrolysis: Water and CO2, CO2 utilization, dry reforming
- Fuel processing; supported/unsupported catalysts; carbon and sulfur fouling, gas separation membranes
- Applications: Centralized and distributed generation, CHP and μ-CHP, Hydrogen production, portable and unmanned operations

Symposium Organizers:

- Narottam P. Bansal, NASA Glenn Research Center, USA
- Mihails Kusnezoff, Fraunhofer IKTS, Germany
- Prabhakar Singh, University of Connecticut, USA
- J. S. Chung, POSTECH, Korea
- Tatsumi Ishihara, Kyushu University, Japan
- Nguyen Q. Minh, Consultant, USA
- Mogens Mogensen, Risoe National Laboratory, Denmark
- J. Obrien, INL, USA
- Jeffry W. Stevenson, Pacific Northwest National Laboratory, USA
- Toshio Suzuki, AIST, Japan
- Eric D. Wachsman, University of Maryland, USA

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One to Four Occupants	$149
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US Government Employee:	Prevailing Rate

Mention The American Ceramic Society to obtain the special rate. Room rates are effective until December 11, 2012 and are based on availability.

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velop and validate the bridging computational tools for designing materials from the atomistic to the component scale and predict their properties and performance. Included in this activity is the use and development of in-situ, real time characterization tools at multi-scales to determine the controlling mechanisms of deformation, fracture and ultimate failure with the objective to develop the capability to design, create, synthesize, process and manufacture high strain rate tolerant material and material systems. It will be accomplished through a Collaborative Research Alliance between the Army Research Laboratory and external partners.

Symposium Organizers:

- James Campbell, ARL, USA
- Lisa Prokurat Franks, TARDEC, USA
- Todd Jessen, ARL, USA
- Jerry LaSalvia, ARL, USA
- Brian Leavy, ARL, USA
- James McCauley, ARL, USA
- Sikhanda Satapathy, ARL, USA
- David Stepp, ARO, USA
- Jeffrey Swab, ARL, USA
- Andrew Wereszczak, ORNL, USA.

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- Jeffrey J. Swab: +1 (410) 306-0753; jeffrey.j.swab.civ@mail.mil

Exhibition Information

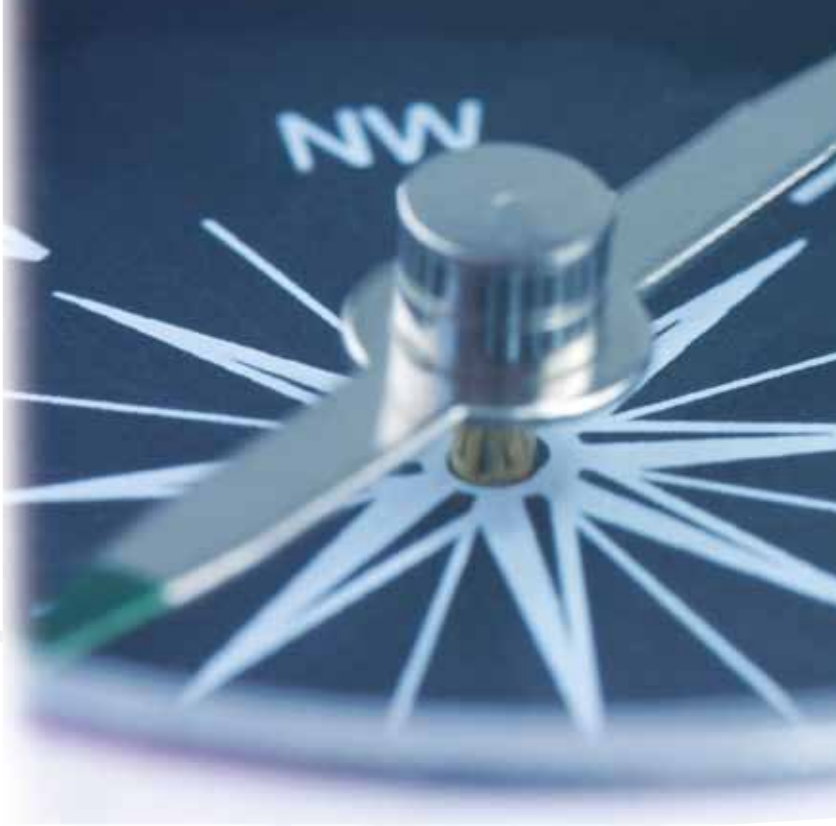
Reserve your booth space today for the premier advanced ceramics & composites event.

This event offers an exceptional opportunity to present your company's latest products, sevices and technology to a sophisticated audience sharply focused on this market.

Exhibits Open:
Tuesday, January 29, 2013, 5:00-8:00 p.m.
Wednesday, January 30, 2013, 5:00-7:30 p.m.

Exposition Location:
Ocean Center Arena, 101 North Atlantic Avenue, Daytona Beach, Fla.

Visit www.ceramics.org/daytona2013 for more details or contact Patricia Janeway at pjaneway@ceramics.org or at 614-794-5826.



SYMPOSIUM 5: Next Generation Bioceramics and Biocomposites

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, bio-inspired materials, biomimetic materials, and inorganic-organic structures have 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 Symposium Topics

- Porous bioceramics (joint with Symposium 9)
- Advanced processing of bioceramics
- Bio-synthetic interfaces
- Biomineralization and tissue-material interactions
- Bioactive and resorbable ceramics
- Bio-inspired 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)
- Ceramic biosensors

Symposium Organizers:

- Roger Narayan, University of North Carolina, USA
- Markus Reiterer, Medtronic, Inc., USA
- Marta Cerruti, McGill University, Canada
- Chikara Ohtsuki, Nagoya University, Japan
- Bikramjit Basu, Indian Institute of Science, India
- Akiyoshi Osaka, Okayama University, Japan

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- Marta Cerruti: marta.cerruti@mcgill.ca
- Chikara Ohtsuki: ohtsuki@apchem.nagoya-u.ac.jp

SYMPOSIUM 6: Advanced Materials and Technologies for Energy Generation and Rechargeable Energy Storage

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 clean energy generation with zero-emission will require advances in materials developments for electricity generation as well as efficient and reliable energy storage. This symposium will focus on the advanced engineering ceramics and technologies that could help the global community to achieve the stated goals. As for the electric energy generation focuses will be on materials for energy harvesting and renewable energy generation. On the other hand, energy storage improvements in materials design, electrodes architecture, and cell chemistry are key factors to extend the life, enhance the safety, and lower the cost of rechargeable batteries that are regarded as the most efficient energy storage systems for portable electronics, 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 critically needed to face these challenges. The search for advanced high capacity electrode materials and the implementation of the very challenging lithium-air batteries will be necessary to overcome the energy density shortfall in currently commercial batteries.

Proposed Symposium Topics

- Thermoelectric materials for energy harvesting
- Materials for thermionic and thermovoltaic applications
- Materials for solar-thermal applications
- Advanced anode and cathode materials for lithium batteries
- Materials design, screening, and electrode architectures for lithium batteries
- Diagnostics and materials characterization for lithium batteries
- Electrode/electrolyte interface characterization for lithium batteries
- Applications focused lithium batteries
- Lithium metal-air battery technology
- Sodium batteries and beyond lithium batteries
- Materials of capacitive energy storage (super-capacitors)

Symposium Organizers:

- H. T. Lin, Oak Ridge National Laboratory, USA
- Sean Li, University of New South Wales, Australia
- Shirley Meng, UC San Diego, USA
- Sujanto Widjaja, Corning Incorporated, USA
- Marca Doeff, Lawrence Berkeley National Laboratory, USA
- Michael E. Badding, Corning Incorporated, USA
- Dominique Guyomard, Institut des Matériaux Jean Rouxel, France
- Tohru Sekino, Tohoku University, Japan
- Jai Prakash, Illinois Institute of Technology, USA
- Kuan-Zong Fung, National Cheng Kung University, Taiwan
- Terry Tritt, Clemson University, USA
- Palani Balaya, National University of Singapore, Singapore
- Ilias Belharouak, Argonne National Laboratory, USA

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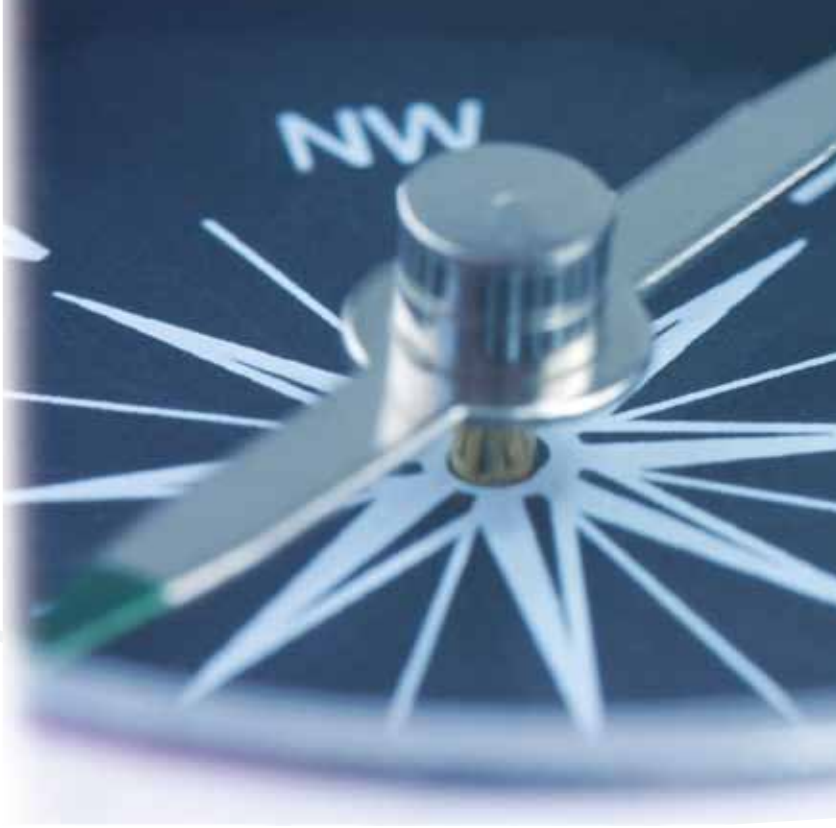

SYMPOSIUM 7: 7th International Symposium on Nanostructured Materials and Nanocomposites

This symposium will focus on science and engineering of nanostructured materials, with a strong focus on recent innovation in nano-technological approaches and their impact on the current challenges of energy and sustainability. In particular, special emphasis will be given to novel synthesis approaches, functionalization, processing, and characterization of nanoparticles, nanowires and their heterogeneous structures. Application of nanostructures in drug-delivery, catalysis, energy and sensing applications, nanocomposites in structural light-weight materials, nanostructured coatings for photovoltaic, bio-medical and optical applications will form the major thrust areas. Contributions related to fabrication of nanomaterials-based products and challenges related to the large-scale production and integration of functional and structural nanomaterials will be given particular attention.

Proposed Symposium 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 thermo-electrics
- Nanodevices: fabrication and large-scale integration
- Characterization and manipulation techniques for nano-structures

Symposium Organizers:

- Sanjay Mathur, University of Cologne, Germany
- Suprakas Sinha Ray, DST/CSIR- National Centre for Nano-materials, South Africa
- Marlies van Bael, Hasselt University, Belgium
- Yoon-Bong Hahn, Chonbuk National University, Korea
- Aivaras Kareiva, Vilnius University, Lithuania
- Kerstin Schierle-Arndt, BASF, Germany
- Janet B. Hurst, NASA Glenn Research Center, Ohio, USA
- Greta Patzke, University of Zurich, Switzerland
- Wilhelm Schwieger, Erlangen University, Germany
- Davide Barreca, University of Padua, Italy

Point of Contact:

- Sanjay Mathur: +49 (221) 470-4107; sanjay.mathur@uni-koeln.de

SYMPOSIUM 8: 7th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT7)

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 result in 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 fiber reinforced and particulate composites, non-oxide and oxide based structural ceramics, 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.

Proposed Symposium Topics

- Advanced composite manufacturing technologies, hybrid processes
- Nano-reinforcement processing (CNT, graphene, etc.)
- Advanced fiber fabrication
- Microwave-or microwave assisted processing, SPS
- High density plasma processing, plasma assisted processing
- Aqueous synthesis and processing, colloidal processing
- Polymer-based processing
- Rapid prototyping, patterning, templates and self-assembly
- Design-oriented manufacturing and processing
- Large scale/complicated shape processing
- 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, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center, USA
- Soshu Kirihara, Osaka University, Japan
- Eugene Medvedovski, Umicore Indium Products, USA
- Ian Nettleship, University of Pittsburgh, USA
- Lalit Kumar Sharma, Central Glass & Ceramic Research Institute, India
- Richard D. Sisson, Jr., Worcester Polytechnic Institute, USA
- Hisayuki Suematsu, Nagaoka University of Technology, Japan
- Nahum Travitzky, University of Erlangen-Nuremberg, Germany

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- Mrityunjay Singh: Mrityunjay.Singh-1@nasa.gov

SYMPOSIUM 9: Porous Ceramics: Novel Developments and Applications

This symposium aims to bring together engineers, technologists and scientists in the area of ceramic, carbon, glass and glass-ceramic materials containing high volume fractions of porosity, with porosity ranging from nano- to milli-meters. These materials include cellular and high surface area architectures including but not limited to foams, honeycombs, fiber networks, connected rods, connected hollow bodies, syntactic foams, bio-inspired structures, micro- and meso-porous materials and aero-gels. In all these components, tailored porosity is the defining characteristic enabling their application in a wide range of fields.

Porous ceramics components are in fact an essential and critical part of numerous structures and devices in various engineering applications. Applications of considerable recent interest include hydrogen and energy-related technologies, environmental technologies (in particular Diesel Particulate Filters), sensors, catalysis supports (photo-catalysis, etc.), water purification, hot gas filtration, mass separation and porous matrix fiber composites. Micro- and meso-porous materials, monoliths possessing hierarchical porosity as well as novel processing methods, including automated manufacturing techniques, also are of particular interest.

Papers are solicited on fundamental and novel aspects of processing, synthesis, characterization, modeling, properties evaluation and applications of all the wide spectrum of highly 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 is devoted to Porous Bioceramics, and will be co-organized in conjunction with Symposium 5 (Next Generation Bioceramics).

Proposed Symposium Topics

- Innovations in processing methods & synthesis of porous ceramics
- Structure and properties of porous ceramics
- Modeling of porous structures and properties
- Novel characterization tools of porous structures
- Mechanical behavior of porous ceramics
- Micro-porous and meso-porous ceramics
- Ceramics with hierarchical porosity
- 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, University of Padova, Italy
- James Zimmerman, Corning Incorporated, USA
- Lennart Bergstrom, University of Stockholm, Sweden
- Aldo Boccaccini, University of Erlangen-Nuremberg, Germany
- Yuji Iwamoto, Nagoya Institute of Technology, Japan
- Alek Pyzik, The Dow Chemical Company
- Thomas R. Watkins, Oak Ridge National Laboratory, USA
- Yuping Zhen, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

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- James W. Zimmermann: ZimmermaJW@corning.com

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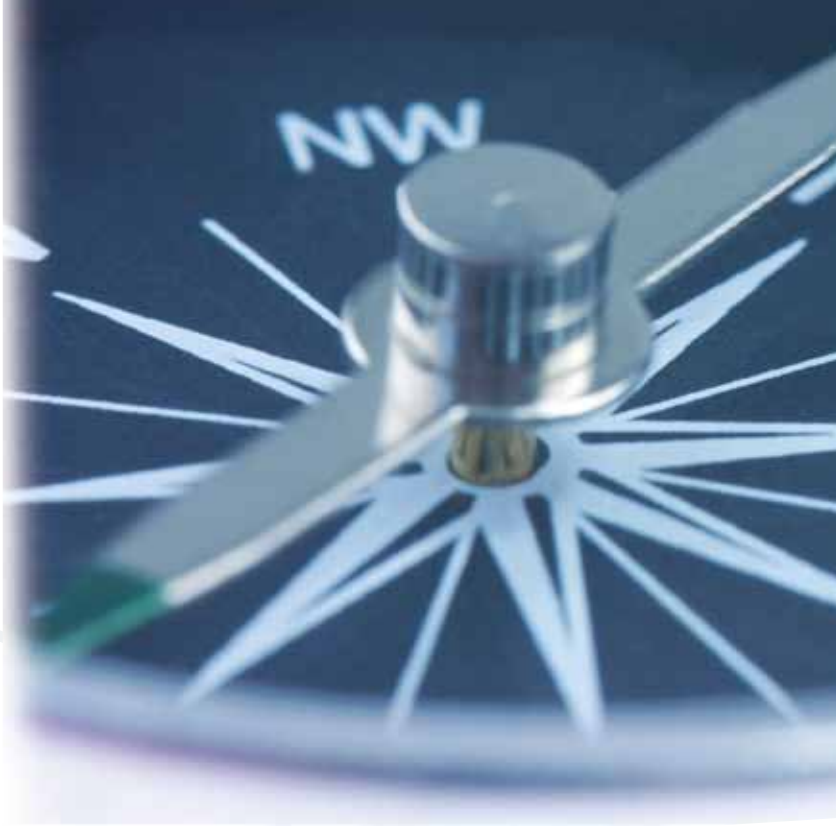

SYMPOSIUM 10: Virtual Materials (Computational) Design and Ceramic Genome

Recent progress in computational material science has significantly enhanced the efficiency with which the understanding of fundamentals phenomena, the improvement of materials performance, the optimization of processing, the discovery of new materials, and the design of structural components can be achieved. Yet, many challenges remain. This symposium will focus on the design, modeling, simulation and characterization of ceramics and composites so as to further optimize their behavior and facilitate the design of new ceramics and composites with tailored properties. A broader perspective is desired including the interest related to ceramic genome, virtual materials design for new innovative materials and thermo-structure, prediction of the structure and properties of crystals and defects, modeling materials behavior under extreme/harsh environments, application of novel simulation methods for materials processing and performance, simulation of novel ceramics for functional applications, and the characterization and modeling of surfaces, interfaces and grain boundaries at multiple scales.

Proposed Symposium Topics

- Ceramic genome
- Novel simulation methods for materials processing and performance
- Multi-scale modeling approaches
- Modeling materials behavior under extreme/harsh environments (ultrahigh temperature, radiation, environmental damages)
- Model-aided design of thermal insulating and thermo-structural materials
- Modeling and design of new innovative ceramics for functional applications
- Prediction of the crystal structure and properties of new ceramics
- Modeling defects and amorphous matter
- Characterization and modeling of surfaces, interfaces and grain boundaries at multiple scales

Symposium Organizers:

- Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences, China
- Brian Good, NASA Glenn Research Center, USA
- Jian Luo, Clemson University, USA
- Katsuyuki Matsunaga, Nagoya University, Japan
- Paul Rulis, University of Missouri-Kansas City, USA
- Hans J. Seifert, University of Karlsruhe, Germany
- Isao Tanaka, Kyoto University, Japan
- Gerard L. Vignoles, University of Bordeaux, France
- William J. Weber, Oak Ridge National Laboratory, USA

Point of Contact:

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SYMPOSIUM 11: Next Generation Technologies for Innovative Surface Coatings

Demands for new surface coatings with complex performance requirements from a single material system continue to grow strongly in many industries. Longer operation life, lower friction for energy efficiency, corrosion- and wear-resistant are key technical attributes required by sectors such as automobile, heavy duty, and power generation industries. It has been shown that innovative surface coatings with optical, magnetic, electronic, catalytic, mechanical, chemical, and tribological functionalities can be tailored via high-tech nano-composite coatings. The path for mass production economy to deploy such technical solution is of primary interest. This symposium will focus on the technology development addressing industrial demands, highlighting examples of successful industrialization, the use of new applications and the future trends of the nano-composite coatings with multi-functionalities. The forum will bring scientists, engineers, and practitioners together from universities, research institutes, coating industries, and equipment suppliers for the comprehensive discussions on the latest advances in nano-composite coatings.

Proposed Symposium Topics

- Next generation production methods for surface engineering
- Innovative technology to enhance surfaces in automobiles, electronic devices, mechanical parts
- Low friction coating, enhanced lifetime, improved corrosion protection
- Surface engineering for light alloys
- Industrialization of developed technologies facilitating mass production
- Technical problems and corresponding solutions of surface related properties and processes in industry

Symposium Organizers:

- Taejin Hwang, Korea Institute of Industrial Technology, Korea
- Kyoung Il Moon, Korea Institute of Industrial Technology, Korea
- Dileep Singh, Argonne National Laboratory, USA
- Alan W. Weimer, University of Colorado, USA
- Sang Sub Kim, Inha University, Korea
- Se Hoon Kwon, Pusan National University, Korea

- Tadachika Nakayama, Nagaoka University of Technology, Japan
- Jun Akedo, The National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Tim Hosenfeldt, Schaeffler Group, Germany

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- Kyoung Il Moon: kimono@kitech.re.kr

SYMPOSIUM 12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nano-laminated Ternary Carbides and Nitrides (MAX Phases)

Ultrahigh temperature ceramics (UHTCs) and nano-laminated ternary carbides and nitrides (MAX phases) are potential materials for use in extreme environments such as streamjet engine components, leading edges and thermal protection systems for hypersonic vehicles, and cladding materials in generation IV nuclear reactors. However, their thermal/chemical stability in extreme environments, the ability to be formed into complex shapes/sharp edges, thermal shock resistance, irradiation resistance, and damage tolerance are all critical challenges limiting near-term industrial applications of these materials. Consequently, further research is needed to understand multi-scale structure-property relationships of existing systems; design new compositions/composites; investigate new approaches for improving the thermal shock resistance, thermochemical 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 Symposium Topics

- Structure-property relationships
- Materials design
- Novel processing methods (bulk, coatings and thin films)
- Novel characterization methods and lifetime assessment
- 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)

Symposium Organizers:

- Yanchun Zhou, Aerospace Research Institute of Material & Processing Technology, China
- Jon Binner, Loughborough University, UK
- Erica L. Corral, University of Arizona, USA
- Per Eklund, Linköping University, Sweden
- William G. Fahrenholtz, Missouri University of Science and Technology, USA
- Frederic Monteverde, Institute of Science and Technology of Ceramics-CNR, Italy
- Miladin Radovic, Texas A&M University, USA
- Jochen Schneider, Materials Chemistry, RWTH Aachen, Germany
- Luc J Vandeperre, Imperial College London, UK
- Guo-Jun Zhang, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

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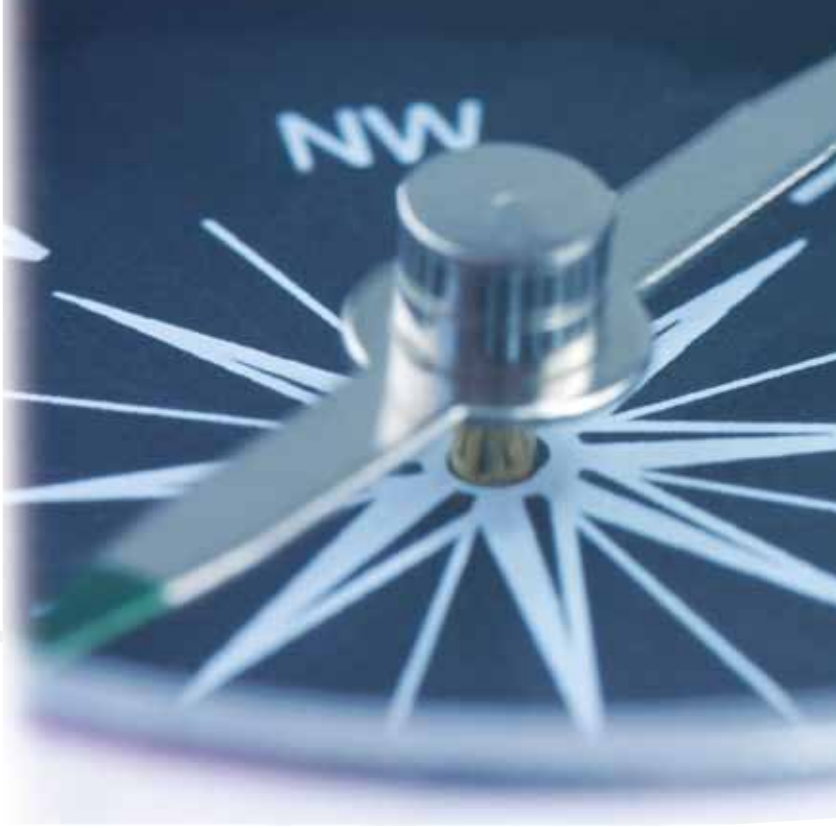

SYMPOSIUM 13: Advanced Ceramics and Composites for Sustainable Nuclear Energy and Fusion Energy

Ceramics and ceramic composites are attracting growing attention as the key enabling materials for safer and sustainable nuclear energy and for future fusion energy systems. This symposium provides a venue for material scientists and nuclear engineers to discuss the opportunities and needs for advanced ceramics and for the related applications, and the current state-of-the-art science and technology of these materials ranging from materials design, processing, and properties to qualification and licensing. This symposium is co-sponsored by the ACerS Nuclear and Environmental Technology Division.

Proposed Symposium Topics

- Ceramics and composites technology for accident-tolerant LWR fuels and core
- Ceramic and carbon composites for high temperature reactors and other advanced fission reactor concepts
- Ceramics and composites for detection of nuclear radiation, fusion blanket, divertor
- Effects of irradiation and operating environment
- Joining and coating for reactor components
- Graphite and carbon materials
- Defect production, evolutions, and interactions
- Fuel reprocessing and management of fission product elements
- Crystalline, amorphous and composite materials for waste immobilization
- Fuel evolutions modeling
- Novel ceramics and composites for nuclear and fusion
- Codes and standards, design methodology

Symposium Organizers:

- Yutai Katoh, Oak Ridge National Laboratory, USA
- Josef Matyas, Pacific Northwest National Laboratory, USA
- Monica Ferraris, Politecnico di Torino, Italy
- Steve Gonczy, Gateway Materials Technology, USA
- Lance Snead, Oak Ridge National Laboratory, USA
- Veena Tikare, Sandia National Laboratory, USA
- Tatsuya Hinoki, Kyoto University, Japan
- Kazuhiro Sawa, Japan Atomic Energy Agency, Japan
- William Weber, University of Tennessee, USA
- Izabela Szlufarska, University of Wisconsin, USA
- Tim Burchell, Oak Ridge National Laboratory, USA
- Kevin Fox, Savannah River National Laboratory, USA

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- Josef Matyas: (509) 372-5997; Josef.Matyas@pnl.gov

FOCUSED SESSION 1: Geopolymers and Chemically Bonded Ceramics

Geopolymers are a class of totally inorganic, alumino- silicate 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

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

Symposium Organizer:

- Maricela Lizcano, NASA-Glenn Research Center, USA

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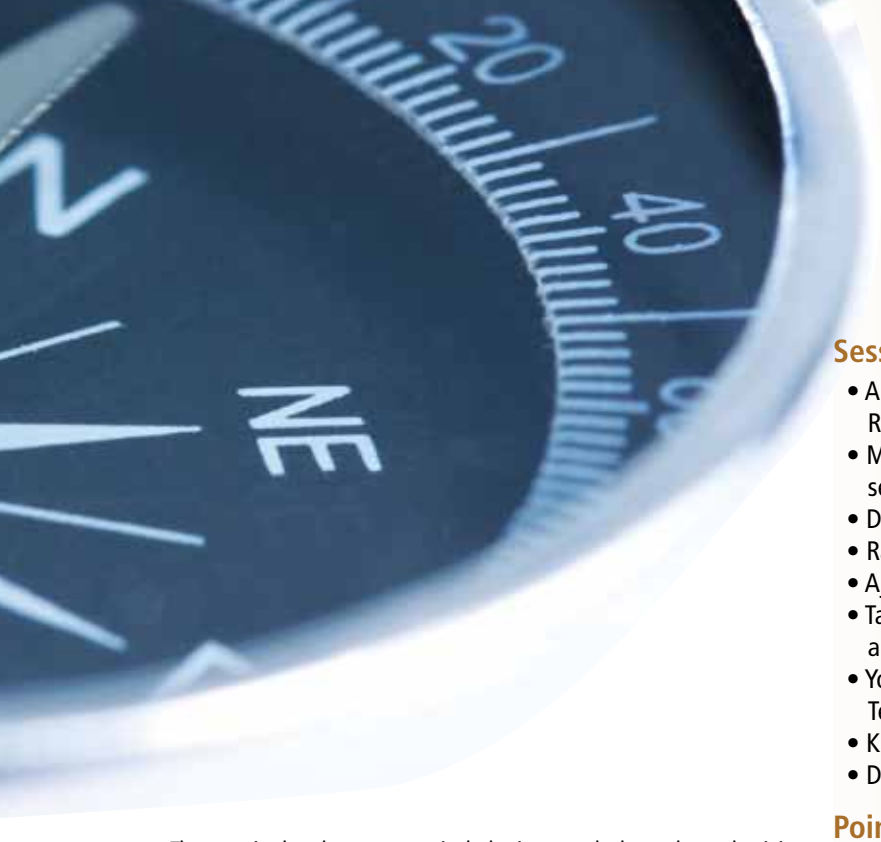
FOCUSED SESSION 2: Thermal Management Materials and Technologies

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. Another high profile application involves thermal protection systems (TPS) for aerospace vehicles (e.g., the reinforced carbon composite leading edge of the Space Shuttle). Furthermore, thermal energy storage devices (TESD) are seeing greater utilization in engineered products. TESD 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)
- Harsh environment, light weight insulating materials (aerogels, foams)
- 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)
- Heat transfer nanofluids
- Phase change materials and associated technologies
- Bonding and integration technologies, thermal contact materials
- Nondestructive evaluation, quality assessment, structural health monitoring, sensors,

Session 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 Laboratory, USA
- Rajiv Asthana, University of Wisconsin-Stout, USA
- Ajit K. Roy, Air Force Research Laboratory, WPAFB, USA
- Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology, Japan
- You Zhou, National Institute of Advanced Industrial Science and Technology, Japan
- Khairul Alam, Ohio University, USA
- Debjyoti Banerjee, Texas A&M University, USA

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- Mrityunjay Singh: +1 (216) 433-8883; Mrityunjay.Singh-1@nasa.gov

FOCUSED SESSION 3: Nanomaterials for Sensing Applications: Fundamental Material Designs to Device Integration

Nanomaterials exhibit new properties with significant potential for sensing applications. Nevertheless, for such nanostructures to realize their full potential they must be integrated in complex and large scale architectures as well as their fundamental properties need to be well-known and fully controlled. Thus, advances in nanoscience and nanotechnology are required to attain better sensors in the future.

This symposium will focus on science and technology of nanostructured materials with interesting and promising properties for sensing applications. Beside approaches towards novel synthesis, processing and modeling of their structure-property correlations at the nanometer length scales, their practical application in different sensing technologies will make up the major thrust areas. Integration of nanostructured materials in proof-of-concept devices close to the industry requirements will be given particular attention.

Session Organizers:

- Francisco Hernandez-Ramirez, Catalonia Institute for Energy Research and University of Barcelona, Spain
- Jia Grace Lu, University of Southern California, USA
- Alexander Gaskov, Chemistry Department of Moscow State University, Russia
- Gerhard Müller, EADS Deutschland GmbH - Innovation Works, Germany
- Ignasi Vilajosana, Worldsensing, Spain

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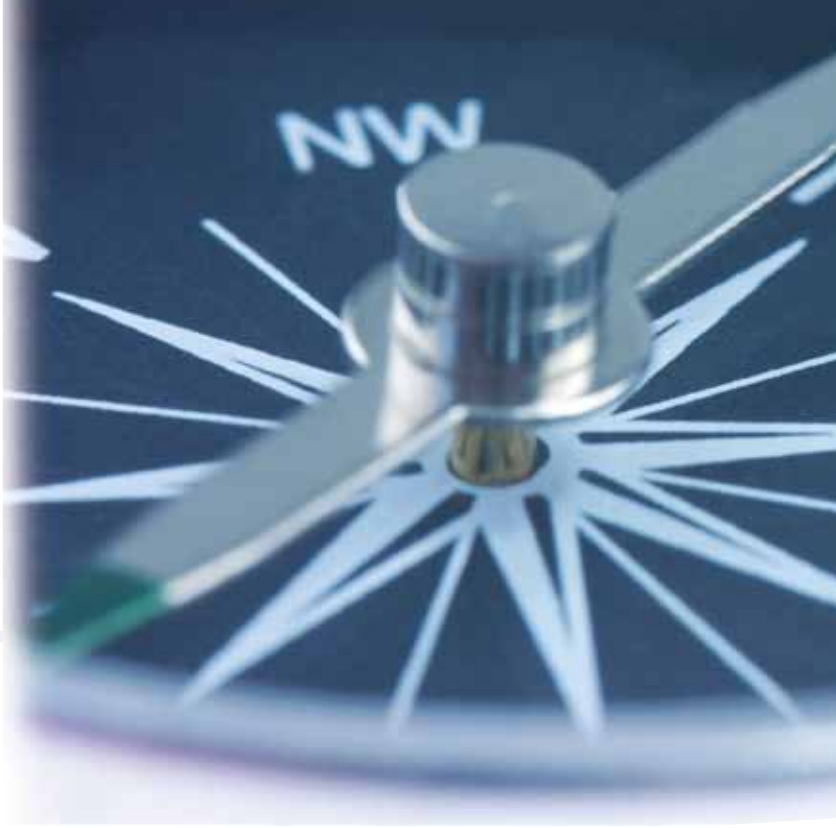

FOCUSED SESSION 4: Advanced Ceramic Materials and Processing for Photonics and Energy

In the past few years significant progress has been reported on the synthesis as well as on the structural, physical and chemical characterization of self-assembled metal oxide nanostructures with sizes in the range of 1-100 nm that exhibit size-dependent properties. The field of nanostructured materials (e.g. nanowires, nanorods, nanotetrapods) has become one of the most active research areas within the nano-science community. Such materials are leading to fundamental new discoveries as well as applications in Photovoltaics, Electroceramics, Multi-ferroic materials, Catalysis and Solar Hydrogen.

This session focuses on synthesis, structural and functional characterization of self-organized materials and nanostructures of all ceramic materials with application potentials as functional materials, with particular consideration given to the capability to tailor and control material properties via surface and structural modifications. Furthermore, this focused session will also be devoted to new nanotechnology tools and technological procedures useful for the development of new functional devices integrating bottom-up and top-down technologies.

Proposed Session Topics

- Multi-functional materials
- Advanced and nanostructured materials for photonics
- Advanced and nanostructured materials for electronics
- Advanced and nanostructured materials for sensing
- Advanced and nanostructured materials for photo-voltaics including solar hydrogen

Session Organizers:

- Alberto Vomiero, CNR – University of Brescia, Italy
- Xiao Wei Sun, Nanyang Technological University, Singapore
- Federico Rosei, University du Quebec, Canada

Point of Contact:

- Alberto Vomiero: Alberto.vomiero@ing.unibs.it

2ND GLOBAL YOUNG INVESTIGATOR FORUM

The Global Young Investigators Forum aims to facilitate scientific discussions among young researchers and exchange of ideas essential to identify emerging global challenges at the interface of physics, chemistry, biology, medicine, material research and engineering. Young researches below 35 years of age are invited to join this event to share and discuss their recent results in form of brief presentations, which will be followed by discussions. This forum will help to establish global cooperation and networks among young scientists to approach future challenges in ceramic science and technology. This interdisciplinary workshop will cover, but is not limited to the following thematic areas.

Proposed Session Topics

- Frontiers in ceramic chemistry and physics: mew precursors for functional ceramics; ceramics and catalysis, functional surfaces
- Ceramic hybrid materials and composites: ceramic matrix composites, biological and medical applications
- Ceramic processing and application: novel processing and synthesis routes
- Applications: ceramic sensors and actuators, energy generation and storage, photo-catalysis
- Young researchers' mobility and networks

Session Organizers:

- Fernando Torres Andón, Karolinska Institute, Sweden
- Thomas Fischer, University of Cologne, Germany
- Seyedeh Mahboobeh Hosseini, University of California at Davis, USA
- Karra Raveendran Girish Karthik, Nanyang Technological University, Singapore
- Thomas Krause, University of Bremen, Germany
- Joaquin Ramírez Rico, University of Seville, Spain

Point of Contact:

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ENGINEERING CERAMICS SUMMIT OF THE AMERICAS

During the last fifty years, a wide ranging, ground breaking research, technology development, and commercialization in the field of engineering and functional ceramics took place in the American continent. 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 summit follows two very successful summits held previously, namely Pacific Rim Engineering Ceramics Summit in 2011 and EU-US Engineering Ceramics Summit in 2012. The Ceramics Summit of Americas 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 American continent (South, Central and North America). 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
- Refractories and Glass Ceramics Technologies
- 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.

Summit Organizers:

- Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center, USA
- Jose Arana Varela, Sao Paulo Research Foundation, Sao Paulo, Brazil
- Enrique Rocha-Rangel, Universidad Politécnica de Victoria, Mexico
- Kevin Plucknett, Dalhousie University, Canada
- Edgar Dutra Zanotto, Federal University of Sao Carlos, Brazil
- Victor Carlos Pandolfelli, Federal University of Sao Carlos, Brazil
- Miriam Susana Castro, University of Mar del Plata, Argentina
- Reginaldo Muccillo, IPEN, Brazil
- Claudia Patricia Garcia, Universidad Nacional de Colombia - Sede Medellín, Colombia
- Aldo Bologna Alles, Universidad de la República, Uruguay

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