

# Welcome

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Welcome to the 35th International Cocoa Beach Conference & Exposition on Advanced Ceramics & Composites. The International Conference on Advanced Ceramics and Composites (ICACC) is the most prominent international meeting in the area of advanced structural and functional ceramics, composites, and other emerging ceramic materials and technologies. This prestigious conference has been organized by the Engineering Ceramics Division (ECD) and The American Ceramic Society 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. 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.



Special thanks go to our sponsors including the US Army Research Office, Plasma Electronic GMBH, A-Tech Systems (South Korea), UBE Industries (Japan), Inocera, Inc. (South Korea), and American Elements whose generous support enables a more successful meeting.

The ECD Executive Committee and volunteer organizers, in addition to The American Ceramic Society, thank you for joining us in Daytona Beach, Florida for what should be a stimulating and beneficial experience.

Dileep Singh  
2011 Program Chair  
Argonne National Lab

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## **ACerS Division Leadership**

### **Engineering Ceramics Division Leadership**

**Trustee:** Mrityunjay Singh

**Chair:** Tatsuki Ohji

**Chair-Elect:** Dileep Singh

**Vice Chair/Treasurer:** Sanjay Mathur

**Secretary:** Sujanto Widjaja

**Past Chair:** Jonathan Salem

# Schedule At A Glance

## **Sunday, January 23, 2011**

	<b>Time</b>	<b>Room</b>
Conference Registration	2 p.m. – 7 p.m.	Hilton – Coquina Foyer
Speaker Ready Room	2 p.m. – 7 p.m.	Hilton – Manatee
Resume Workshop Session	4 p.m. – 5 p.m.	Hilton – Coquina B
Welcome Reception	5 p.m. – 7 p.m.	Hilton – Coquina Foyer

## **Monday, January 24, 2011**

Conference Registration	7 a.m. – 6 p.m.	Hilton – Coquina Foyer
Member and Publication Center	7 a.m. – 6 p.m.	Hilton – Coquina Foyer
Speaker Ready Room	8 a.m. – 4 p.m.	Hilton – Manatee
Companion Coffee	8 a.m. – 10 a.m.	Hilton – Oceanview Room
Opening Awards Ceremony & Plenary Session	8:30 a.m. – 12 p.m.	Hilton – Coquina D and E
Coffee Break	10:20 a.m. – 10:40 a.m.	Hilton – Coquina Foyer
Lunch On Own	12 p.m. – 1:30 p.m.	
Concurrent Technical Sessions	1:30 p.m. – 6 p.m.	Hilton
Coffee Break	3 p.m. – 3:20 p.m.	Hilton – Coquina Foyer
Student & Young Professional Mixer	7 p.m. – 9 p.m.	Hilton – Flagler A & B

## **Tuesday, January 25, 2011**

Conference Registration	7 a.m. – 6 p.m.	Hilton – Coquina Foyer
Member and Publication Center	7 a.m. – 6 p.m.	Hilton – Coquina Foyer
Speaker Ready Room	8 a.m. – 4 p.m.	Hilton – Manatee
Concurrent Technical Sessions	8 a.m. – 12 p.m.	Hilton
Coffee Break	9:40 a.m. – 10 a.m.	Hilton – Coquina Foyer
Exhibitor Move-In	12 p.m. – 4 p.m.	Ocean Center
Lunch On Own	12 p.m. – 1:30 p.m.	
Concurrent Technical Sessions	1:30 p.m. – 5:20 p.m.	Hilton
Coffee Break	3 p.m. – 3:20 p.m.	Hilton – Coquina Foyer
Poster Session A Move-In	3 p.m. – 4:30 p.m.	Ocean Center
Exhibits & Poster Session A – Including Reception	5 p.m. – 8 p.m.	Ocean Center – Entrance through Atlantic B

## **Wednesday, January 26, 2011**

Conference Registration	7:30 a.m. – 5:30 p.m.	Hilton – Coquina Foyer
Member and Publication Center	7:30 a.m. – 5:30 p.m.	Hilton – Coquina Foyer
Speaker Ready Room	8 a.m. – 4 p.m.	Hilton – Manatee
Concurrent Technical Sessions	8 a.m. – 12 p.m.	Hilton
Coffee Break	9:40 a.m. – 10 a.m.	Hilton – Coquina Foyer
Lunch On Own	12 p.m. – 1:30 p.m.	
Concurrent Technical Sessions	1:30 p.m. – 5 p.m.	Hilton
Poster Session B Move-In	3 p.m. – 4:30 p.m.	Ocean Center
Coffee Break	3 p.m. – 3:20 p.m.	Hilton – Coquina Foyer
Exhibits & Poster Session B – Including Reception	5 p.m. – 7:30 p.m.	Ocean Center – Entrance through Atlantic B

# Schedule At A Glance

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## Thursday, January 27, 2011

Conference Registration	7:30 a.m. – 6 p.m.	Hilton – Coquina Foyer
Member and Publication Center	7:30 a.m. – 6 p.m.	Hilton – Coquina Foyer
Speaker Ready Room	8 a.m. – 4 p.m.	Hilton – Manatee
Mechanical Properties of Ceramics and Glass*	8 a.m. – 5 p.m.	Hilton – Flagler A
Concurrent Technical Sessions	8 a.m. – 12 p.m.	Hilton
Coffee Break	9:40 a.m. – 10 a.m.	Hilton – Coquina Foyer
Lunch On Own	12 p.m. – 1:30 p.m.	
Concurrent Technical Sessions	1:30 p.m. – 6 p.m.	Hilton
Coffee Break	3 p.m. – 3:20 p.m.	Hilton – Coquina Foyer

## Friday, January 28, 2011

Conference Registration	7:30 a.m. – 12:30 p.m.	Hilton – Coquina Foyer
Mechanical Properties of Ceramics and Glass*	8 a.m. – 5 p.m.	Hilton – Flagler A
Concurrent Technical Sessions	8 a.m. – 12 p.m.	Hilton
Coffee Break	9:40 a.m. – 10 a.m.	Hilton – Coquina Foyer

\*Note: Separate registration fee required for Mechanical Properties of Ceramics and Glass Short Course

# Directions from the Hilton to Ocean Center

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To get to the Ocean Center from the Hilton, exit the Hilton through the South Tower Lobby. Turn left on the sidewalk to the crosswalk. Proceed across the street to the Ocean Center entrance.



**Hilton:**  
 Welcome Reception  
 Registration  
 Technical Sessions  
 Member and Publications  
 Center

**Ocean Center:**  
 Exhibit & Reception  
 Poster Session

# Special Events

## Welcome Reception

Sunday, January 23

5 p.m. – 7 p.m.

Hilton – Coquina Foyer

## Resume Workshop

Sunday, Jan. 23

4 p.m. - 5 p.m.

Hilton - Coquina Room B

The National Institute of Ceramic Engineers (NICE) presents its popular Resume Workshop session, presented by Prof. Victor A. Greenhut of Rutgers University. At the session, you can sign up for One-on-One Resume Tune-Ups during the week. Dr. Greenhut will provide novel ideas and practical tips on creating a great resume and some guidelines to successful interviewing - plus individual help with your resume. Attend the presentation on Sunday and sign up there for personal help Monday-Thursday. (Bring a print copy of your resume for one-on-one coaching with Dr. Greenhut, schedule permitting).

## Shot Glass Contest

Tuesday, January 25

6 p.m. – 8 p.m.

The Ocean Center, Exhibit Show Floor

Organized by ACerS President's Council of Student Advisors (PCSA)

Don't miss this design contest! Students are given one shot glass and have 45 minutes to build their protection devices with drinking straws. Then, the glasses are dropped from varying levels until the breaking threshold is reached. The glass with the highest successful drop distance wins!

## Mechanical Properties of Ceramics and Glass Short Course\*

Thursday, January 27th and Friday, January 28th

8 a.m. – 5 p.m.

Hilton – Flagler A

\*Separate registration fee

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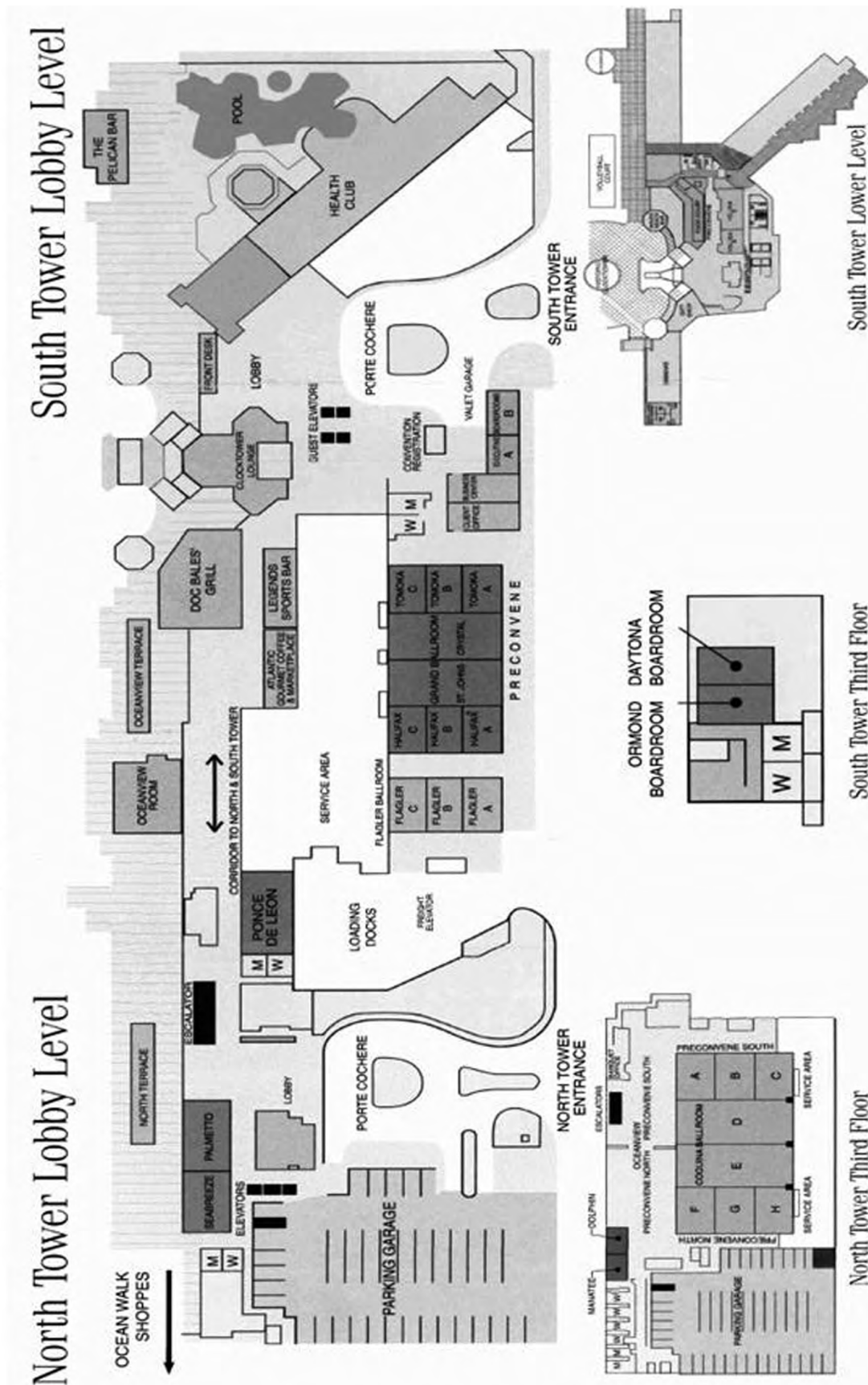
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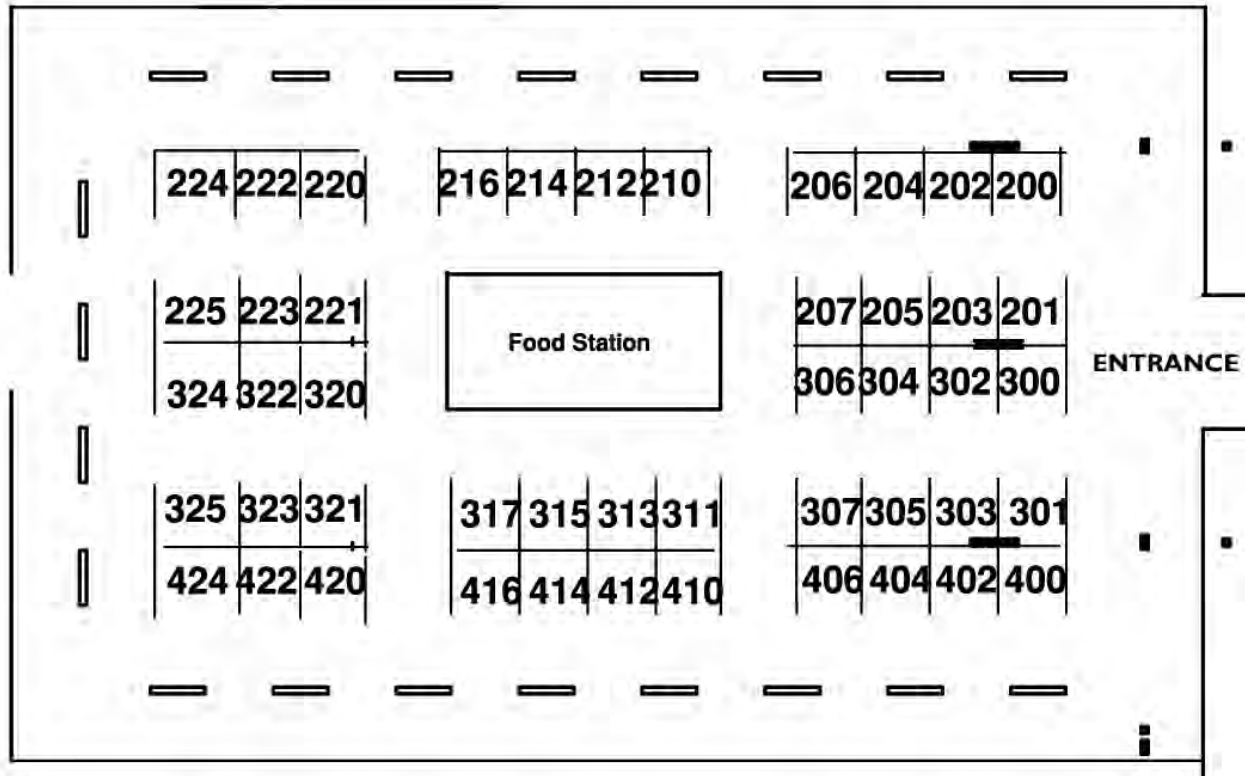
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# Hilton Meeting Room Floor Plan

## Hilton Daytona Beach Oceanfront Resort Floor Plan



# Expo Floor Plan & Booth Information



Exhibitor	Booth #	Exhibitor	Booth #
AACCM	221	Linseis, Inc.	313
Alfred University	305	McDanel Advanced Ceramic Technologies	317
Anter Corp.	404	MEL Chemicals	202
AVS, Inc.	210	Microtrac, Inc.	304
Buhler, Inc.	303	MTI Corp.	322
Carbolite, Inc.	206	Nabertherm	307
CASC - Imperial College London	325	Netsch Instruments N.A. LLC	201
Centorr Vacuum Industries	416	Netsch Premier Technologies LLC	203
Ceramic Institute Clausthal	204	New Lenox Machine Co., Inc.	306
CM Furnaces, Inc.	311	Nippon Yttrium Co., Ltd. (NYC)	301
Dorst Technology	214	Oxy-Gon Industries, Inc.	320
Dunhua Zhengxing Abrasives Co., Ltd.	205	Powder Processing & Technology LLC	323
Eirich Machines, Inc.	402	PremaTech Advanced Ceramics	410
ENrG Inc.	424	PSC, Inc	225
ESL ElectroScience	212	Quantachrome	224
Evans Analytical Group	315	R.D. Webb Co.	216
fuelcellmaterials.com	406	Riedhammer	321
Gasbarre Products (PTX-Pentronix)	302	Sonoscan, Inc.	222
Haiku Tech, Inc.	220	Starfire Systems, Inc.	422
Harper International	420	TEAM by Sacmi	321
Harrop Industries, Inc.	200	TevTech	207
HED International	412	Thermal Wave Imaging	223
Heraeus Materials Technology	400	Wiley-Blackwell	300
Keith Co.	324		

# Plenary Speakers

## 2011 James I. Mueller Award

Title: "Thermal Protection Materials: From Retrospect to Foresight"

9:00 AM



**Sylvia M. Johnson**  
NASA-Ames Research Center  
USA

Johnson received a B.Sc. (Hons.) in ceramic engineering from the University of New South Wales and an M.S. and Ph.D in materials science and engineering (Ceramics) from the University of California, Berkeley. She worked at SRI International in Menlo Park California primarily in the area of ceramic and composite processing and characterization. She also worked on high temperature superconductors, preceramic polymers, coatings, and in business consulting for materials companies. She was the Director of Ceramic and Chemical Product Development when she left SRI to join NASA Ames in 2000 as Chief of the Thermal Protection Materials and Systems Branch. During this time she developed extensive materials processing and evaluation capabilities for NASA Ames. Her own research focused on ultrahigh temperature ceramics and composites. Since late 2009 she has been the Chief Materials Technologist in the Entry Vehicles and Systems Division at NASA-Ames. She has served the American Ceramic Society as both a vice president and an elected director, Counselor of the San Francisco Bay Area section, and was a chair of PACRIM 5. She was a member of the National Materials Advisory board from 1997 to 2002, chairing the first two Materials forums, and has since served on a number of NRC committees. In 2008 she became a lifetime National Associate of the National Research Council.

## 2010 Bridge Building Award

Title: "Carbon/Carbon Composites to Ceramic Matrix Composites: High End Applications Through Controlled Microstructure"

9:40 AM



**Lalit Mohan Manocha**  
Sardar Patel University  
India

Manocha is Professor and Head of the Department of Materials Science at Sardar Patel University, Gujarat. Prior to this, he was a senior Scientist at National Physical Laboratory, New Delhi. After his basic degrees in Physics from Kurukshetra University, he obtained his Ph.D. in Science in 1976 from Delhi University for his work on Development and Characterization of carbon Fibers, the work he did at National Physical Laboratory, New Delhi. His first Post Doctoral was at Institut Chemische Technik, University of Karlsruhe Germany during 1977-78 under Alexander von Humboldt Fellowship wherein he worked on Development of Carbon-Carbon composites. He was JSPS Fellow at Tokyo Institute of Technology during 1985-86, Foreign Professor at TIT during 1998, and UNIDO Expert to South Korea in 1991. His current Research & Development interests are in the field of Carbon fibers and carbon-carbon composites for strategic and Industrial applications; Processing, Structure, properties relationship; Development of carbon nanomaterials, Porous carbons and carbon nanocomposites for structural, thermal and energy applications; carbon based ceramics and composites; high temperature ceramics and ceramic matrix composites. He is Fellow of National Academy of Sciences, India and GSA. He is recipient of many awards including MRSI medal, Vikram Sarabhai Award, and Homi Bhabha award of University Grants Commission, India.

## Plenary Speaker

Title: "Opportunities for Advanced Ceramics and Composites in the Nuclear Sector"

10:40 AM



**William Edward Lee**  
Imperial College London, UK

Lee holds a BSc in Physical Metallurgy from Aston University, a PhD in Radiation Damage in Sapphire from Oxford University and was a post doc at Case Western Reserve University and Assistant Prof at Ohio State in the USA in the 1980's. He spent 17 years at Sheffield University in England before moving to Imperial College London in 2006. He is currently Professor of Ceramic Engineering and Director of the Centre for Advanced Structural Ceramics in the Department of Materials at Imperial, Deputy Chair of the UK Government advisory Committee on Radioactive Waste Management (CoRWM), an IAEA Technical Expert, a Fellow of the American Ceramic Society and a member of the American Ceramic Society Board of Directors. His research interests include radwaste and radiation damage, clays and clay-based ceramics, glass ceramics, structural ceramics and ceramic matrix composites, high temperature refractory composites and ceramics in environmental cleanup. He has published over 300 papers, been co-author of 4 books and supervised nearly 50 students to completion of their PhDs.

## Plenary Speaker

Title: "Nanogenerator and Nano-Piezotronics"

11:20 AM



**Zhong-Lin Wang**  
Georgia Institute of Technology, USA

Wang is a Regents' Professor, COE Distinguished Professor and Director, Center for Nanostructure Characterization, at Georgia Tech. Dr. Wang is a foreign member of the Chinese Academy of Sciences, member of European Academy of Sciences, fellow of American Physical Society, fellow of AAAS, fellow of Microscopy Society of America and fellow of Materials Research Society. He has received the 2001 S.T. Li prize for Outstanding Contribution in Nanoscience and Nanotechnology, the 2000 and 2005 Georgia Tech Outstanding Faculty Research Author Awards, Sigma Xi 2005 sustain research awards, the 1999 Burton Medal from Microscopy Society of America, and the 2009 Purdy award from American ceramic society. He is an honorable professor of 6 universities worldwide. Dr. Wang is the world's top 10 most cited authors in nanotechnology and materials science. He has published four scientific reference and textbooks and over 620 peer reviewed journal articles, 45 book chapters, edited and co-edited 14 volumes of books on nanotechnology, and held 28 patents. His entire publications have been cited for over 36,000 times. The H-index of his citations is 92.

# Technical Sessions By Symposium

Session Title	Day	Time	Location
<b>S1: Mechanical Behavior and Performance of Ceramics &amp; Composites</b>			
Fracture Mechanics, Modeling, & Testing	24-Jan	1:30 - 5:50 pm	Coquina Salon A
Reliability and Life Prediction Methodologies	25-Jan	8:00 - 10:50 am	Coquina Salon A
Nondestructive Evaluation	25-Jan	10:50 am - 12:10 pm	Coquina Salon A
Mechanical Behavior of Ceramics and Composites	25-Jan	1:30 - 5:20 pm	Coquina Salon A
Composites: Fibers, Matrices, Interfaces and Applications	26-Jan	8:00 - 11:50 am	Coquina Salon A
Environmental Effects of Ceramics and Composites	26-Jan	1:30 - 3:50 pm	Coquina Salon A
Characterization	26-Jan	3:50 - 5:10 pm	Coquina Salon A
Processing-Microstructure-Properties Correlations I	27-Jan	8:00 am - 12:10 pm	Coquina Salon A
Processing-Microstructure-Properties II	27-Jan	1:30 - 6:10 pm	Coquina Salon A
Joining	28-Jan	8:00 - 9:40 am	Coquina Salon A
Tribological Properties of Ceramics and Composites	28-Jan	9:40 - 11:40 am	Coquina Salon A

## **S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications**

Thermal Barrier Coatings I	24-Jan	1:30 - 6:30 pm	Coquina Salon G
Thermal Barrier Coatings II	25-Jan	8:00 - 11:40 am	Coquina Salon G
Environmental Barrier Coatings for Turbine Engines and Extreme Environments	25-Jan	1:30 - 5:40 pm	Coquina Salon G
Functionally Graded Coatings and Interfaces	26-Jan	8:00 - 10:00 am	Coquina Salon G
Advanced Coating Characterization Methods and Non-Destructive Evaluation	26-Jan	10:00 am - 12 Noon	Coquina Salon G
Coatings to Resist Wear, Erosion and Tribological Loadings	26-Jan	1:30 - 5:30 pm	Coquina Salon G
Advanced Coating Processing and Nanostructured Coating Systems	27-Jan	8:00 am - 12 Noon	Coquina Salon G
Multifunctional and Nanostructured Coating Systems	27-Jan	1:30 - 5:20 pm	Coquina Salon G

# Technical Sessions By Symposium

## **S3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology**

Cell and Stack Development	24-Jan	1:30 - 3:20 pm	Coquina Salon E
Novel Cell/Stack Design and Processing	24-Jan	3:20 - 5:50 pm	Coquina Salon E
Electrodes I	25-Jan	8:00 am - Noon	Coquina Salon E
Reliability/Degradation	25-Jan	1:30 - 3:20 pm	Coquina Salon E
Sealant Glasses	25-Jan	3:20 - 5:20 pm	Coquina Salon E
Electrodes II	26-Jan	8:00 - 10:00 am	Coquina Salon E
Electrolytes	26-Jan	10:00 am - Noon	Coquina Salon E
Fuel Reforming	26-Jan	1:30 - 2:20 pm	Coquina Salon E
Electrochemical/Mechanical/Thermal Performance	26-Jan	2:20 - 5:00 pm	Coquina Salon E
Electrolysis	27-Jan	8:00 - 10:00 am	Coquina Salon E
Surface/Interfacial Reactions	27-Jan	10:00 am - Noon	Coquina Salon E
Interconnects	27-Jan	1:30 - 6:00 pm	Coquina Salon E

## **S4: Armor Ceramics**

Phenomenology and Mechanics of Ceramics Subjected to Ballistic Impact I	24-Jan	1:30 - 6:00 pm	Coquina Salon D
Phenomenology and Mechanics of Ceramics Subjected to Ballistic Impact II	25-Jan	8:00 - 10:00 am	Coquina Salon D
High-Rate Real-Time Characterization	25-Jan	10:00 am - 12:10 pm	Coquina Salon D
Microstructural Design for Enhanced Armor Ceramics	25-Jan	1:30 - 5:10 pm	Coquina Salon D
Nondestructive Characterization	26-Jan	8:00 - 10:50 am	Coquina Salon D
Multi-Scale Modeling I	26-Jan	10:50 am - Noon	Coquina Salon D
Multi-Scale Modeling II	26-Jan	1:30 - 2:30 pm	Coquina Salon D
Manufacturing	26-Jan	2:30 - 4:50 pm	Coquina Salon D

## **S5: Next Generation Bioceramics**

Advanced Processing of Bioceramics	25-Jan	1:30 - 5:40 pm	Ponce de Leon
Porous Bioceramics I (jointly with Symposium 9)	26-Jan	8:00 am - Noon	Ponce de Leon
Porous Bioceramics II (jointly with Symposium 9)	26-Jan	1:00 - 5:50 pm	Ponce de Leon
In Vitro and In Vivo Characterization of Bioceramics	27-Jan	8:00 am - Noon	Ponce de Leon
Medical and Dental Applications of Bioceramics	27-Jan	1:30 - 5:10 pm	Ponce de Leon

# Technical Sessions By Symposium

## ***S6: International Symposium on Ceramics for Electric Energy Generation, Storage, and Distribution***

Thermoelectric Materials for Energy Harvesting	27-Jan	1:30 - 5:50 pm	Coquina Salon B
Materials for Energy Storage and Technologies	28-Jan	8:00 - 11:50 am	Coquina Salon B

## ***S7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications***

Nanostructured Membranes, Thin Films, Functional Coatings	25-Jan	8:00 am - 12 Noon	Coquina Salon C
Polymer Nanocomposite Technology and Nanoporous Materials	25-Jan	1:30 - 5:20 pm	Coquina Salon C
Nanomaterials for Photocatalysis, Solar Hydrogen and Thermoelectrics	26-Jan	8:00 am - 12 Noon	Coquina Salon C
Nanotubes, Nanorods, Nanowires and Other One-dimensional Structures	26-Jan	1:30 - 5:30 pm	Coquina Salon C
Industrial Development and Application of Nanomaterials	27-Jan	8:00 am - 12 Noon	Coquina Salon C
Synthesis, Functionalization and Processing of Nanostructured Materials I	27-Jan	1:30 - 5:30 pm	Coquina Salon C
Synthesis, Functionalization and Processing of Nanostructured Materials II	28-Jan	8:00 am - 12 Noon	Coquina Salon C

## ***S8: 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT) in honor of Professor Katsutoshi Komeya***

In Honor of Professor Komeya	24-Jan	1:30 - 6:00 pm	Coquina Salon B
Novel Forming and Sintering I	25-Jan	8:00 am - Noon	Coquina Salon B
Novel Forming and Sintering II	25-Jan	1:40 - 5:20 pm	Coquina Salon B
Design-Oriented Manufacturing I	26-Jan	8:30 - 11:50 am	Coquina Salon B
Design-Oriented Manufacturing II	26-Jan	1:30 - 4:40 pm	Coquina Salon B
Design-Oriented Manufacturing III	27-Jan	8:30 am - Noon	Coquina Salon B

## ***S9: Porous Ceramics: Novel Developments and Applications***

Processing Methods for Porous Ceramics I	24-Jan	1:30 - 3:20 pm	Coquina Salon H
Processing Methods for Porous Ceramics II	24-Jan	3:20 - 6:10 pm	Coquina Salon H
Structure and Properties of Porous Ceramics I	25-Jan	8:00 - 10:10 am	Coquina Salon H
Structure and Properties of Porous Ceramics II	25-Jan	10:10 am - 12:20 pm	Coquina Salon H
Structure and Properties of Porous Ceramics III	25-Jan	1:30 - 3:20 pm	Coquina Salon H
Applications of Porous Ceramics	25-Jan	3:20 - 5:20 pm	Coquina Salon H

# Technical Sessions By Symposium

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## ***S10: Thermal Management Materials and Technologies***

Nano Heat Transfer Fluids and Thermal Energy Storage	26-Jan	1:40 - 4:40 pm	Coquina Salon F
Advanced Materials and Design for Thermal Management	27-Jan	8:40 - 11:20 am	Coquina Salon F

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## ***S11: Advanced Sensor Technology: Developments and Applications***

Advanced Sensor Technology	24-Jan	1:30 - 5:00 pm	Coquina Salon C
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## ***S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)***

Novel Processing I	26-Jan	8:00 - 9:50 am	Coquina Salon H
Novel Processing II	26-Jan	9:50 - 11:40 am	Coquina Salon H
New Materials	26-Jan	1:30 - 3:20 pm	Coquina Salon H
Novel Characterization	26-Jan	3:20 - 5:00 pm	Coquina Salon H
Oxidation Behavior	27-Jan	8:00 - 10:00 am	Coquina Salon H
Mechanical Properties	27-Jan	10:00 am - Noon	Coquina Salon H
Thermal Stability	27-Jan	1:30 - 3:30 pm	Coquina Salon H
Joining & Novel Processing	27-Jan	3:30 - 6:10 pm	Coquina Salon H
Structural Stability Under Extreme Environments	28-Jan	8:00 - 9:30 am	Coquina Salon H

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## ***S13: Advanced Ceramics and Composites for Nuclear Fusion Applications***

Fuel Ceramics Science and Technology	25-Jan	8:00 - 10:10 am	Oceanview
Carbon Materials and Fuel Ceramics II	25-Jan	10:10 am - 12 Noon	Oceanview
Joining and Integration of Ceramic Structures	25-Jan	1:30 - 3:30 pm	Oceanview
Crystalline, Amorphous and Composite Materials for Waste Immobilization	25-Jan	3:30 - 5:20 pm	Oceanview
Processing I	26-Jan	8:00 - 10:10 am	Oceanview
Processing II and Mechanical Properties	26-Jan	10:10 am - 12 Noon	Oceanview
Composite Materials for Fusion Energy	26-Jan	1:30 - 3:20 pm	Oceanview
Ceramic Composites for Nuclear Applications	26-Jan	3:20 - 4:50 pm	Oceanview
Irradiation Effects on Advanced Ceramics and Composites I	27-Jan	8:00 - 10:10 am	Oceanview
Fuel Ceramics II and Irradiation Effects II	27-Jan	10:10 - 11:50 am	Oceanview

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# Technical Sessions By Symposium

## ***S14: Advanced Materials and Technologies for Rechargeable Batteries***

Advanced Materials for Lithium-ion Batteries	24-Jan	1:30 - 6:00 pm	Coquina Salon F
Diagnostics and Materials Characterization for Lithium-ion Batteries	25-Jan	8:30 am - Noon	Coquina Salon F
Materials Design, Screening, and Electrode Architectures for Lithium-ion Batteries	25-Jan	1:30 - 5:10 pm	Coquina Salon F
Lithium Batteries and Beyond	26-Jan	8:30 am - Noon	Coquina Salon F

## ***Pacific Rim Engineering Ceramics Summit***

Pacific Rim Engineering Ceramics Summit I	24-Jan	1:30 - 5:50 pm	Ponce de Leon
Pacific Rim Engineering Ceramics Summit II	25-Jan	8:00 am - 12:20 pm	Ponce de Leon

## ***FS1: Geopolymers and Other Inorganic Polymers***

Synthesis and Processing	27-Jan	1:30 - 4:00 pm	Coquina Salon F
Porosity in Geopolymers	27-Jan	4:00 - 5:30 pm	Coquina Salon F
Properties and Composites	28-Jan	8:00 - 11:00 am	Coquina Salon F
Phosphate-Based Inorganic Polymers	28-Jan	11:00 am - 12 Noon	Coquina Salon F

## ***FS2: Computational Design, Modeling, and Simulation of Ceramics and Composites***

Characterization of New Materials, Interfaces and Grain Boundaries at Atomic Scale	27-Jan	8:00 am - 12 Noon	Coquina Salon D
Prediction/Simulation of Crystal Structure and Properties	27-Jan	1:30 - 6:00 pm	Coquina Salon D
Novel Simulation Methods for Materials Processing and Performance	28-Jan	8:00 am - 12 Noon	Coquina Salon D

# Symposia

---

## 2011 Program Chair: Dileep Singh Argonne National Lab

### **Symposium 1: Mechanical Behavior and Performance of Ceramics & Composites**

**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

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

**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

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

**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. O'Brien, INL, USA; Robert Steinberger-Wilckens, Forschungszentrum-Jülich 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

### **Symposium 4: Armor Ceramics**

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

### **Symposium 5: Next Generation Bioceramics**

**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

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

**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

### **Symposium 7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications**

**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

### **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**

**Organizers:** Tatsuki Ohji, AIST, Japan; Mrityunjay Singh, OAI, NASA Glenn Research Center, USA; Srinivasa Rao Boddapati, Kennametal Conforma Clad, USA; Soshu Kirihiara, 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

## **Symposium 9: Porous Ceramics: Novel Developments and Applications**

**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

## **Symposium 10: Thermal Management Materials and Technologies**

**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

## **Symposium 11: Advanced Sensor Technology: Developments and Applications**

**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

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

**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. Fahrenholtz, 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

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

**Organizers:** Yutai Kato, 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

## **Symposium 14: Advanced Materials and Technologies for Rechargeable Batteries**

**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

## **Focused Session 1: Geopolymers and Other Inorganic Polymers**

**Organizer:** Waltraud M. Kriven University of Illinois at Urbana-Champaign Urbana, Illinois, USA

## **Focused Session 2: Computational Design, Modeling, and Simulation of Ceramics and Composites**

**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

## **Pacific Rim Engineering Ceramics Summit**

**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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# 2011-2012



## Meetings & Expositions of The American Ceramic Society

MAY 15 – 19, 2011

**Glass & Optical Materials Division Meeting**

Hilton Savannah DeSoto  
Savannah, Georgia, USA  
[www.ceramics.org/gomd2011](http://www.ceramics.org/gomd2011)

MAY 2 – 4, 2011

**Structural Clay Products Division Meeting**

Gettysburg, Pennsylvania, USA

JULY 24 – 26, 2011

**Cements Division/Center for Advanced  
Cement-Based Materials Annual Meeting**

Vanderbilt University  
Nashville, Tennessee, USA  
[www.ceramics.org/cements2011](http://www.ceramics.org/cements2011)

AUGUST 1 – 3, 2011

**Ceramic Leadership Summit**

Hyatt Regency Baltimore  
Baltimore, Maryland, USA  
[www.ceramics.org/cls2011](http://www.ceramics.org/cls2011)

OCTOBER 16 – 20, 2011

**Materials Science & Technology 2011  
Conference & Exhibition (MS&T'11) &  
ACerS 113<sup>th</sup> Annual Meeting**

Greater Columbus Convention Center  
Columbus, Ohio, USA  
[www.matscitech.org](http://www.matscitech.org)

JANUARY 18 – 20, 2012

**Electronic Materials & Applications**

DoubleTree Resort Orlando International Dr.  
Orlando, Florida, USA

JANUARY 22 - 27, 2012

**36<sup>th</sup> International Conference & Exposition  
on Advanced Ceramics & Composites**

Hilton Daytona Beach Resort & Ocean Center  
Daytona Beach, Florida, USA

JULY 15-19, 2012

**ICC4—International Congress on Ceramics**

Chicago, Illinois, USA  
[www.ceramics.org/icc4](http://www.ceramics.org/icc4)

OCTOBER 7 – 11, 2012

**Materials Science & Technology 2012  
Conference & Exhibition (MS&T'12) &  
ACerS 114<sup>th</sup> Annual Meeting**

David L. Lawrence Convention Center  
Pittsburgh, Pennsylvania, USA  
[www.matscitech.org](http://www.matscitech.org)

# Inocera inc.

## Introduction

- Location: Yongin, Korea
- CEO : JOWOONG H
- Employee: 21 persons
- Products : SiC parts, Ceram



## History

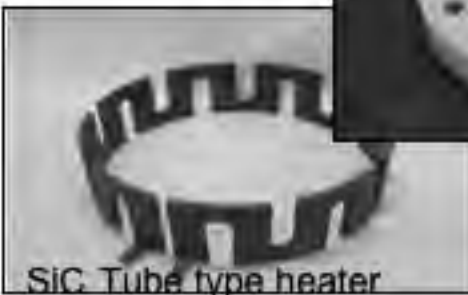
- 2001. Jan.: set-up Factory
- 2003. Mar.: Vendor for Samsung Elec.
- 2005. Apr.: ISO 9001 acquired.
- 2010. Aug.: vendor for AMAT

## Products

SiC jig. For semiconductor



SiC Plate type heater



SiC Tube type heater



Zirconia part



LED Susceptor

## Key Technologies



Big size & complicated shape forming

Various type of Ceramic (SiC, ZrO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> etc)



Total Solution For Ceramic part

Joining tech. to 3-D product

Superior R&D ability



- Ceramic processing
- High Purity SiC
- Warm pressing
- Yttria material

# Presenting Author List

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Fung, K.	28-Jan	10:00AM	Coquina Salon B	66	Hotta, M.	26-Jan	3:40PM	Coquina Salon B	51
<b>G</b>					Howell, P.C.	24-Jan	4:30PM	Coquina Salon G	28
Gadow, R.	25-Jan	8:00AM	Coquina Salon B	34	Hu, G.	25-Jan	10:30AM	Coquina Salon D	33
Gadow, R.	27-Jan	10:00AM	Coquina Salon G	56	Huang, J.	24-Jan	2:30PM	Ponce de Leon	31
Gaines, L.	26-Jan	11:10AM	Coquina Salon F	48	Huang, L.	27-Jan	3:40PM	Coquina Salon D	64
Gallops, S.	25-Jan	9:50AM	Coquina Salon A	31	Hundal, J.S.	27-Jan	5:30PM	Coquina Salon B	62
Gamble, E.A.	25-Jan	9:00AM	Coquina Salon D	33	Hwang, T.	27-Jan	11:00AM	Coquina Salon C	58
Gao, M.	28-Jan	8:30AM	Coquina Salon D	67	<b>I</b>				
Gazonas, G.A.	26-Jan	10:50AM	Coquina Salon D	45	Iqbal, S.S.	25-Jan	2:20PM	Coquina Salon A	36
Ghosh, S.	24-Jan	4:40PM	Coquina Salon D	29	Iqbal, S.S.	27-Jan	10:00AM	Coquina Salon F	58
Girija, E.	25-Jan	4:30PM	Ponce de Leon	38	Iqbal, S.S.	27-Jan	11:10AM	Coquina Salon A	56
Gomez, H.	25-Jan	4:40PM	Coquina Salon C	39	Ishihara, T.	25-Jan	8:30AM	Coquina Salon E	32
Gomez, H.	26-Jan	4:20PM	Coquina Salon B	51	Ishikawa, T.	24-Jan	4:20PM	Ponce de Leon	31
Gonczy, S.T.	26-Jan	4:30PM	Oceanview	53	Ivekovic, A.	26-Jan	9:10AM	Oceanview	47
Gong, X.	24-Jan	2:30PM	Coquina Salon C	30	Iwamoto, Y.	24-Jan	3:20PM	Coquina Salon H	30
González-Julián, J.	27-Jan	2:30PM	Coquina Salon A	60	<b>J</b>				
Gonzenbach, U.T.	24-Jan	2:00PM	Coquina Salon H	30	Jaafar, M.	25-Jan	3:20PM	Coquina Salon A	36
Gooch, W.A.	24-Jan	2:30PM	Coquina Salon D	28	Jackson, R.	25-Jan	10:00AM	Coquina Salon G	32
Good, B.	27-Jan	11:00AM	Coquina Salon D	60	Jain, H.	26-Jan	8:00AM	Ponce de Leon	45
Gopalakrishnan, K.	24-Jan	4:10PM	Coquina Salon A	27	Jiang, C.	27-Jan	2:30PM	Coquina Salon D	64
Goto, T.	24-Jan	4:00PM	Coquina Salon B	29	Jiang, D.	25-Jan	4:20PM	Coquina Salon B	39
Goto, T.	25-Jan	8:30AM	Ponce de Leon	36	Johnson, S.	24-Jan	9:00AM	Coquina Salon D	27
Gouma, P.	26-Jan	3:40PM	Ponce de Leon	50	Jordan, E.H.	26-Jan	10:40AM	Coquina Salon G	44
Grader, G.	27-Jan	5:00PM	Coquina Salon G	61	Joulain, A.	26-Jan	4:40PM	Coquina Salon H	52
Graetz, J.	24-Jan	3:50PM	Coquina Salon F	31	Jue, J.	24-Jan	4:40PM	Coquina Salon C	30
Green, W.H.	26-Jan	10:10AM	Coquina Salon D	45	Jung, S.	26-Jan	2:40PM	Coquina Salon F	52
Greene, R.B.	25-Jan	4:20PM	Coquina Salon A	36	<b>K</b>				
Gruen, D.M.	27-Jan	3:50PM	Coquina Salon B	62	Kam, K.C.	25-Jan	2:00PM	Coquina Salon F	41
Gubb, T.A.	27-Jan	3:20PM	Coquina Salon F	64	Kanamura, K.	25-Jan	3:20PM	Coquina Salon F	41
Gumbsch, P.	27-Jan	10:00AM	Coquina Salon D	60	Kang, B.	26-Jan	4:20PM	Coquina Salon E	49
Gupta, N.	26-Jan	8:30AM	Coquina Salon H	47	Kang, B.	27-Jan	11:00AM	Coquina Salon E	57
Gupta, Y.M.	25-Jan	10:00AM	Coquina Salon D	33	Kang, B.	27-Jan	8:30AM	Coquina Salon E	56
Guzman, M.	27-Jan	5:10PM	Coquina Salon B	62	Kaplan, W.D.	26-Jan	8:30AM	Coquina Salon B	46
<b>H</b>					Karandikar, P.	25-Jan	3:50PM	Coquina Salon D	38
Haines, C.	25-Jan	4:00PM	Coquina Salon B	39	Karimi Sharif, H.	27-Jan	5:40PM	Coquina Salon D	65
Haines, C.	27-Jan	4:10PM	Coquina Salon C	63	Kaskel, S.	24-Jan	1:30PM	Coquina Salon H	29
Halloran, J.W.	26-Jan	3:20PM	Coquina Salon H	52	Kata, D.	28-Jan	8:40AM	Coquina Salon A	65
Hammnabard, Z.	27-Jan	11:30AM	Coquina Salon A	56	Katoh, Y.	27-Jan	11:30AM	Oceanview	60
Hampshire, S.	24-Jan	2:40PM	Coquina Salon B	29	Kawano, M.	26-Jan	1:30PM	Coquina Salon E	49
Han, M.	24-Jan	4:20PM	Coquina Salon E	28	Kayiplar, B.	25-Jan	3:20PM	Coquina Salon B	39
Hanan, J.C.	24-Jan	2:10PM	Coquina Salon A	27	Kazemzadeh Dehdashti, M.	27-Jan	2:50PM	Coquina Salon H	63
Hanan, J.C.	27-Jan	2:00PM	Ponce de Leon	62	Kearney, M.	27-Jan	9:10AM	Coquina Salon E	56
Harder, B.	25-Jan	2:20PM	Coquina Salon G	37	Kesavan Pillai, S.	25-Jan	2:40PM	Coquina Salon C	39
Hardy, J.	26-Jan	8:20AM	Coquina Salon E	44	Khoury, H.N.	27-Jan	2:00PM	Coquina Salon F	64
Harrington, G.	27-Jan	11:00AM	Coquina Salon H	59	Kim, C.	25-Jan	4:40PM	Coquina Salon E	37
Hartwich, D.	27-Jan	10:10AM	Coquina Salon A	56	Kim, C.	26-Jan	4:50PM	Oceanview	53
Hashimoto, A.	26-Jan	10:20AM	Coquina Salon B	46	Kim, D.	24-Jan	3:10PM	Coquina Salon D	29
Hass, D.	24-Jan	2:00PM	Coquina Salon G	27	Kim, D.	24-Jan	5:20PM	Coquina Salon B	29
Hay, R.	26-Jan	10:50AM	Coquina Salon A	44	Kim, D.	25-Jan	3:40PM	Coquina Salon B	39
Hay, R.	26-Jan	1:30PM	Coquina Salon A	48	Kim, D.	25-Jan	9:50AM	Ponce de Leon	36
He, H.	25-Jan	3:40PM	Coquina Salon C	39	Kim, H.	25-Jan	11:20AM	Ponce de Leon	36
He, J.	27-Jan	3:40PM	Coquina Salon F	64	Kim, H.	25-Jan	9:00AM	Coquina Salon F	35
Heidari, H.	27-Jan	9:10AM	Coquina Salon A	56	Kim, K.	25-Jan	9:00AM	Ponce de Leon	36
Hermansson, L.A.	27-Jan	3:30PM	Ponce de Leon	62	Kim, K.	26-Jan	9:20AM	Coquina Salon F	48
Hernandez-Ramirez, F.	26-Jan	4:30PM	Coquina Salon C	51	Kim, S.	24-Jan	5:50PM	Coquina Salon G	28
Hill, M.D.	25-Jan	10:40AM	Coquina Salon B	34	Kim, W.	25-Jan	11:00AM	Oceanview	35
Hinoki, T.	25-Jan	2:30PM	Oceanview	40	Kimberley, J.	26-Jan	2:10PM	Coquina Salon D	50
Hirao, K.	24-Jan	4:40PM	Coquina Salon B	29	Kirihara, S.	27-Jan	10:20AM	Coquina Salon B	58
Hoeges, S.	25-Jan	2:30PM	Ponce de Leon	38	Kishimoto, H.	25-Jan	1:50PM	Oceanview	40
Hoffmann, M.J.	24-Jan	5:00PM	Coquina Salon B	29	Kitazawa, R.	25-Jan	9:20AM	Coquina Salon G	32
Hoffmann, M.J.	27-Jan	8:30AM	Coquina Salon D	60	Klemm, H.	24-Jan	2:30PM	Coquina Salon A	27
Hojó, J.	24-Jan	2:20PM	Coquina Salon B	29	Knoche, R.	26-Jan	9:50AM	Coquina Salon A	43
Holesinger, T.G.	28-Jan	9:00AM	Coquina Salon B	65	Knox, V.L.	26-Jan	9:00AM	Coquina Salon C	46
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# Presenting Author List

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Koch, D.	26-Jan	10:10AM	Coquina Salon A	44	Lizcano, M.	28-Jan	9:00AM	Coquina Salon F	67
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Komeya, K.	25-Jan	10:50AM	Ponce de Leon	36	Lu, K.	27-Jan	10:40AM	Coquina Salon E	57
Kondo, N.	26-Jan	4:00PM	Coquina Salon B	51	Lu, K.	27-Jan	2:40PM	Coquina Salon C	63
Kondo, S.	27-Jan	9:30AM	Oceanview	59	Lu, W.	26-Jan	9:00AM	Coquina Salon F	48
Koslowski, M.	24-Jan	4:00PM	Coquina Salon E	28	Lu, Z.	26-Jan	3:20PM	Coquina Salon E	49
Kosmac, T.	27-Jan	11:10AM	Ponce de Leon	57	Lundberg, P.	24-Jan	2:00PM	Coquina Salon D	28
Koyanagi, T.	27-Jan	11:10AM	Oceanview	59	Luo, J.	28-Jan	10:30AM	Coquina Salon D	67
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Kulkov, S.	27-Jan	4:50PM	Coquina Salon A	60	Mack, D.E.	25-Jan	11:00AM	Coquina Salon G	32
Kumagai, T.	25-Jan	5:00PM	Coquina Salon B	39	Maepa, C.E.	27-Jan	3:30PM	Coquina Salon C	63
Kumar, A.	24-Jan	4:40PM	Coquina Salon F	31	Magdefrau, N.	27-Jan	2:20PM	Coquina Salon E	61
Kumari, S.	24-Jan	1:30PM	Coquina Salon C	30	Magnuson, M.	26-Jan	4:10PM	Coquina Salon H	52
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Kutsch, J.	26-Jan	3:50PM	Coquina Salon D	50	Manocha, L.M.	24-Jan	9:40AM	Coquina Salon D	27
Kuwabara, A.	27-Jan	1:30PM	Coquina Salon D	64	Manocha, S.	24-Jan	4:50PM	Coquina Salon H	30
					Manzat, A.	26-Jan	3:20PM	Coquina Salon G	49
					Marshall, D.B.	26-Jan	8:00AM	Coquina Salon A	43
					Mathur, S.	26-Jan	8:00AM	Coquina Salon C	46
					Matsui, T.	25-Jan	1:30PM	Coquina Salon E	37
					Matthews, S.	24-Jan	3:50PM	Coquina Salon H	30
					Matyas, J.	25-Jan	4:20PM	Oceanview	40
					McCuiston, R.	25-Jan	3:30PM	Coquina Salon D	38
					McGee, T.D.	27-Jan	9:20AM	Ponce de Leon	57
					Mduduzi Cele, L.	27-Jan	1:30PM	Coquina Salon C	63
					Mecartney, M.L.	25-Jan	8:30AM	Oceanview	35
					Mecartney, M.L.	26-Jan	11:00AM	Coquina Salon E	45
					Mecholsky, J.	24-Jan	4:30PM	Coquina Salon A	27
					Medvedovski, E.	25-Jan	10:00AM	Coquina Salon B	34
					Medvedovski, E.	26-Jan	4:40PM	Coquina Salon B	51
					Menzler, N.H.	24-Jan	4:50PM	Coquina Salon E	28
					Metroke, T.	27-Jan	5:30PM	Coquina Salon F	64
					Michaelis, A.	24-Jan	2:30PM	Coquina Salon E	28
					Michaux, A.	27-Jan	9:10AM	Oceanview	59
					Mikijelj, B.	27-Jan	1:50PM	Coquina Salon A	60
					Mishra, M.	28-Jan	10:50AM	Coquina Salon B	66
					Mitic, V.	27-Jan	10:00AM	Coquina Salon B	58
					Mo, Y.	28-Jan	9:20AM	Coquina Salon D	67
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					Monteverde, F.	28-Jan	8:40AM	Coquina Salon H	66
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					Moon, S.	27-Jan	4:30PM	Coquina Salon C	63
					Morante, J.R.	26-Jan	8:40AM	Coquina Salon C	46
					Morante, J.R.	27-Jan	10:00AM	Coquina Salon C	58
					Morgan, D.	27-Jan	2:00PM	Coquina Salon D	64
					Morscher, G.	25-Jan	1:30PM	Coquina Salon A	36
					Motshekg, S.C.	27-Jan	2:00PM	Coquina Salon C	63
					Mukhopadhyay, A.	25-Jan	4:50PM	Coquina Salon F	41
					Mullens, S.	26-Jan	11:10AM	Ponce de Leon	46
					Muller, A.M.	25-Jan	9:20AM	Coquina Salon D	33
					Munn, B.S.	26-Jan	4:50PM	Coquina Salon D	50
					Murase, N.	28-Jan	9:20AM	Coquina Salon C	66
					Muthiah, B.	27-Jan	4:10PM	Coquina Salon A	60
					Muthuraman, B.N.	26-Jan	11:30AM	Coquina Salon A	44
					<b>N</b>				
					Naito, M.	24-Jan	5:40PM	Coquina Salon B	29
					Nakao, W.	27-Jan	3:30PM	Coquina Salon A	60
					Nakazato, N.	26-Jan	9:30AM	Oceanview	47
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Neuman, E.W.	27-Jan	5:30PM	Coquina Salon H	64	Ramontja, J.	25-Jan	5:00PM	Coquina Salon C	39
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Nikoobakht, B.	26-Jan	2:30PM	Coquina Salon C	51	Reimanis, I.	27-Jan	10:30AM	Oceanview	59
Noh, J.	25-Jan	8:20AM	Coquina Salon C	33	Reller, A.	26-Jan	2:00PM	Coquina Salon B	51
Nolas, G.	27-Jan	1:30PM	Coquina Salon B	62	Rempp, A.	26-Jan	2:30PM	Coquina Salon G	49
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Nychka, J.A.	27-Jan	2:40PM	Ponce de Leon	62	Ribot, F.	28-Jan	11:10AM	Coquina Salon C	66
<b>O</b>					Richter, H.	25-Jan	11:40AM	Coquina Salon H	35
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Ouvrard, G.	24-Jan	2:00PM	Coquina Salon F	30	Roux, G.	28-Jan	8:20AM	Coquina Salon A	65
Ouyang, J.	24-Jan	5:10PM	Coquina Salon G	28	Rubat du Merac, M.	26-Jan	3:30PM	Coquina Salon D	50
Ozawa, K.	26-Jan	11:00AM	Oceanview	48	Ruffin, M.	25-Jan	4:10PM	Coquina Salon H	40
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Ozgur, C.-.	27-Jan	9:20AM	Coquina Salon C	57	Ruggles-Wrenn, M.	26-Jan	2:30PM	Coquina Salon A	48
Ozhukil Kollath, V.	25-Jan	4:50PM	Ponce de Leon	38	Rullis, P.	27-Jan	10:30AM	Coquina Salon D	60
<b>P</b>					<b>S</b>				
Pai, M.R.	26-Jan	9:20AM	Coquina Salon C	46	Sajgalik, P.	24-Jan	4:20PM	Coquina Salon B	29
Panagiotooulou, C.	28-Jan	9:20AM	Coquina Salon F	67	Salem, J.	24-Jan	2:50PM	Coquina Salon A	27
Pandey, P.C.	24-Jan	2:00PM	Coquina Salon C	30	San, O.	24-Jan	5:10PM	Coquina Salon H	30
Pandhari, A.A.	27-Jan	4:20PM	Coquina Salon D	65	San, O.	24-Jan	5:30PM	Coquina Salon H	30
Pappacena, K.	26-Jan	4:50PM	Coquina Salon G	49	Sanchez, J.	25-Jan	2:20PM	Coquina Salon F	41
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Park, D.	24-Jan	4:00PM	Coquina Salon C	30	Sara, Y.	26-Jan	10:40AM	Coquina Salon B	47
Park, D.	24-Jan	5:30PM	Coquina Salon E	28	Sarikaya, A.	25-Jan	9:00AM	Coquina Salon E	32
Park, Y.	24-Jan	2:20PM	Coquina Salon H	30	Sarin, P.	26-Jan	4:10PM	Coquina Salon A	48
Parthasarathy, T.	27-Jan	8:00AM	Coquina Salon H	59	Sarin, P.	27-Jan	8:30AM	Coquina Salon H	59
Paskaramoorthy, R.	27-Jan	5:50PM	Coquina Salon A	61	Saruhan-Brings, B.	24-Jan	2:30PM	Coquina Salon G	27
Paul, A.	27-Jan	11:40AM	Coquina Salon H	59	Saruhan-Brings, B.	25-Jan	8:40AM	Coquina Salon C	33
Peeler, D.	25-Jan	3:30PM	Oceanview	40	Satsangi, V.R.	26-Jan	10:10AM	Coquina Salon C	46
Pelletant, A.	27-Jan	4:30PM	Coquina Salon A	60	Sauder, C.	25-Jan	1:30PM	Oceanview	40
Pemberton, S.R.	26-Jan	11:10AM	Coquina Salon A	44	Sauder, C.	26-Jan	3:50PM	Oceanview	53
Pfister, C.	28-Jan	10:20AM	Coquina Salon A	65	Schmidt, K.	26-Jan	10:30AM	Coquina Salon D	45
Phillips, J.	25-Jan	4:00PM	Oceanview	40	Schmucker, M.J.	28-Jan	10:30AM	Coquina Salon B	66
Piat, R.	28-Jan	11:00AM	Coquina Salon D	67	Schorr, J.	25-Jan	3:50PM	Coquina Salon H	40
Pinc, W.	27-Jan	4:10PM	Coquina Salon H	64	Schorr, J.	27-Jan	5:00PM	Coquina Salon F	64
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Plucknett, K.P.	26-Jan	11:20AM	Coquina Salon B	47	Sciti, D.	26-Jan	8:30AM	Coquina Salon A	43
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Preiss, A.	24-Jan	4:30PM	Coquina Salon H	30	Sglavo, V.M.	24-Jan	3:20PM	Coquina Salon E	28
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Prochazka, J.	27-Jan	4:00PM	Coquina Salon G	61	Shen, H.	26-Jan	1:30PM	Coquina Salon C	51
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Pruyn, T.	25-Jan	9:30AM	Coquina Salon H	34	Shibata, N.	27-Jan	8:00AM	Coquina Salon D	60
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<b>R</b>					Shinavski, R.J.	26-Jan	2:40PM	Oceanview	53
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					Shinoda, K.	25-Jan	9:00AM	Coquina Salon G	32
					Shinoda, Y.	25-Jan	2:00PM	Coquina Salon D	38



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Yang, X.	28-Jan	11:30AM	Coquina Salon B	66	Zhang, T.	25-Jan	4:40PM	Oceanview	40
Yin, X.	27-Jan	8:00AM	Coquina Salon A	55	Zhang, Y.	25-Jan	5:20PM	Coquina Salon G	37
Yoo, J.	26-Jan	9:00AM	Coquina Salon G	44	Zhang, Y.	27-Jan	8:50AM	Oceanview	59
Yoshida, T.	27-Jan	8:30AM	Coquina Salon G	56	Zhang, Z.	25-Jan	10:30AM	Coquina Salon F	35
Yoshimura, M.	24-Jan	3:20PM	Coquina Salon B	29	Zhang, Z.	25-Jan	2:40PM	Coquina Salon B	39
Yoshimura, M.	26-Jan	8:00AM	Coquina Salon G	44	Zheng, L.	26-Jan	10:20AM	Coquina Salon H	47
Yuan, J.	24-Jan	5:30PM	Coquina Salon A	27	Zheng, L.	26-Jan	1:50PM	Coquina Salon H	52
Yusufoglu, Y.	28-Jan	11:30AM	Coquina Salon F	67	Zhou, Y.	24-Jan	2:00PM	Ponce de Leon	31
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Zapata Solvas, E.	27-Jan	10:20AM	Coquina Salon H	59	Zhu, D.	25-Jan	4:20PM	Coquina Salon G	37
Zeytin, K.	26-Jan	5:30PM	Ponce de Leon	50	Zou, J.	26-Jan	9:00AM	Coquina Salon B	46

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## Monday, January 24, 2011

## Plenary Session

Room: Coquina Salon D

Session Chairs: Dileep Singh, Argonne National Laboratory; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology

**8:30 AM**

**Opening Remarks**

**9:00 AM**

**(ICACC-PL-001-2011) Thermal Protection Materials: From Retrospect to Foresight (Invited)**

S. Johnson\*, NASA Ames Research Center, USA

**9:40 AM**

**(ICACC-PL-002-2011) Carbon/Carbon Composites to Ceramic Matrix Composites: High End Applications Through Controlled Microstructure (Invited)**

L. M. Manocha\*, Sardar Patel University, India

**10:20 AM**

**Break**

**10:40 AM**

**(ICACC-PL-003-2011) Opportunities for Advanced Ceramics and Composites in the Nuclear Sector (Invited)**

W. E. Lee\*, M. Gilbert, R. W. Grimes, Imperial College London, United Kingdom

**11:20 AM**

**(ICACC-PL-004-2011) Nanogenerator and Nano-Piezotronics (Invited)**

Z. Wang\*, Georgia Institute of Technology, USA

## S1: Mechanical Behavior and Performance of Ceramics & Composites

### Fracture Mechanics, Modeling, and Testing

Room: Coquina Salon A

Session Chairs: Rajan Tandon, Sandia National Laboratories; Hagen Klemm, Fraunhofer IKTS

**1:30 PM**

**(ICACC-S1-001-2011) Quantitative Optical Fluorescence Microprobe Measurements of Indentation and Grinding Stresses in Al<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub>/SiC Nanocomposites**

R. I. Todd\*, S. Guo, X. Huang, University of Oxford, United Kingdom

**1:50 PM**

**(ICACC-S1-002-2011) Hertzian Stress Field and Ring Crack Initiation Analysis including the Effect of Friction**

R. Tandon\*, Sandia National Laboratories, USA; B. Paliwal, Georgia Tech – CNRS (UMI-2958), France

**2:10 PM**

**(ICACC-S1-003-2011) Residual Stress in All-Ceramic Zirconia-Porcelain Crown Measured By Nanoindentation**

Y. Zhang, J. C. Hanan\*, Oklahoma State University, USA

**2:30 PM**

**(ICACC-S1-004-2011) High-temperature characterization of ceramic materials by hot-hardness measurement**

H. Klemm\*, A. Bales, K. Nake, G. Michael, Fraunhofer IKTS, Germany

**2:50 PM**

**(ICACC-S1-005-2011) Slow Crack Growth in Coarse Grain Spinel**

J. Salem\*, NASA Glenn Research Center, USA

**3:10 PM**

**Break**

**3:30 PM**

**(ICACC-S1-006-2011) Micromechanical Finite Element Simulation of Fracture Behaviour in Silicon Nitride High-Performance Ceramics**

J. B. Wippler\*, T. Böhlke, Karlsruhe Institute of Technology, Germany

**3:50 PM**

**(ICACC-S1-007-2011) A Novel Proof Test for Silicon-Nitride Balls**

M. O'Brien\*, A. de la Cruz, The Aerospace Corporation, USA

**4:10 PM**

**(ICACC-S1-008-2011) Mixed Mode (I/II) Fracture Behavior of Surface and Chevron Notch Cracks in Diametral Compression**

K. Gopalakrishnan\*, J. J. Mecholsky, University of Florida, USA

**4:30 PM**

**(ICACC-S1-009-2011) Fractal Geometry Applied to Failure Analysis in Materials**

J. Mecholsky\*, U. of Florida, USA

**4:50 PM**

**(ICACC-S1-010-2011) Protocol for Using Atomic Force Microscopy to Measure the Fractal Dimension in the Mirror Region of Fracture Surfaces**

M. Strasberg\*, J. J. Mecholsky, University of Florida, USA

**5:10 PM**

**(ICACC-S1-011-2011) Microcantilever testing of alumina based materials**

N. A. Yahya\*, R. I. Todd, University of Oxford, United Kingdom

**5:30 PM**

**(ICACC-S1-012-2011) Specimen Stress Equilibrium in SHPB Test on Ceramics at High Strain Rate**

J. Yuan\*, J. Ma, Nanyang Technological University, Singapore; G. Tan, DSO National Laboratories, Singapore

## S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications

### Thermal Barrier Coatings I

Room: Coquina Salon G

Session Chairs: Dongming Zhu, NASA Glenn Research Center; Douglas Wolfe, Penn State University

**1:30 PM**

**(ICACC-S2-001-2011) New Developments in Thermal Barrier Coatings (Invited)**

V. Shklover\*, A. Bhattacharya, ETH Zurich, Switzerland

**2:00 PM**

**(ICACC-S2-002-2011) Processing of Thermal Barrier Coatings Systems Via Directed Vapor Deposition (Invited)**

D. Hass\*, B. Gogia, Directed Vapor Technologies International, USA

**2:30 PM**

**(ICACC-S2-003-2011) A TEM and SANS-Study for analysis of phase and morphology of alternative EB-PVD deposited TBC-compositions (Invited)**

B. Saruhan-Brings\*, German Aerospace Center, Germany; V. Ryukhtin, Helmholtz Zentrum Berlin for Materials and Energy, Germany; K. Kelm, German Aerospace Center, Germany

**3:00 PM**

**Break**

**3:20 PM**

**(ICACC-S2-004-2011) Thermal Conductivity of Thermal Barrier Coatings under High Pressure (Invited)**  
H. Wang\*, Oak Ridge National Lab, USA

**3:50 PM**

**(ICACC-S2-005-2011) Processing-Property Relationships in Plasma-Sprayed Gadolinium Zirconate**  
Y. Tan\*, C. M. Weyant, G. Dwivedi, S. Sampath, Stony Brook University, USA

**4:10 PM**

**(ICACC-S2-006-2011) The influence of a thermal gradient on the lifetime of YSZ -based TBC Systems**  
R. Vassen\*, D. E. Mack, A. Guignard, D. Stöver, Forschungszentrum Jülich, Germany

**4:30 PM**

**(ICACC-S2-007-2011) Dependence of thermal conductivity on gas pressure for thermal barrier coatings in power generation gas turbines**  
P. C. Howell\*, U. Rettig, S. Lampenscherf, Siemens AG, Germany; A. Kulkarni, Siemens Energy Inc, USA

**4:50 PM**

**(ICACC-S2-008-2011) Opportunities for Improved TBC Durability in the CeO<sub>2</sub>-TiO<sub>2</sub>-ZrO<sub>2</sub> System**  
J. A. Krogstad\*, M. Lepple, C. G. Levi, University of California, Santa Barbara, USA

**5:10 PM**

**(ICACC-S2-009-2011) Thermophysical properties and hot corrosion behavior of (Sm<sub>1-x</sub>Yb<sub>x</sub>)<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> thermal barrier oxides in air**  
J. Ouyang\*, S. Li, Z. Liu, Y. Zhou, Harbin Institute of Technology, China

**5:30 PM**

**(ICACC-S2-010-2011) Evolution of thermal properties of nanostructured tetragonal yttria-stabilized zirconia with high-temperature aging**  
A. M. Limarga\*, Harvard University, USA; J. Alaniz, J. E. Garay, University of California, USA; D. R. Clarke, Harvard University, USA

**5:50 PM**

**(ICACC-S2-011-2011) Structures and Thermo-Physical Properties of (LaxGd1-x)2Zr2O7 Pyrochlore Systems for Thermal Barrier Coatings (TBCs)**  
S. Kim\*, B. Shim, K. Kwak, S. Lee, Y. Oh, Korea Institute of Ceramics Engineering and Technology, Republic of Korea; B. Jang, National Institute of Materials Science, Japan; H. Kim, Korea Institute of Ceramics Engineering and Technology, Republic of Korea

**6:10 PM**

**(ICACC-S2-012-2011) Comparing the Thermal Properties of Lanthanide doped YSZ Films Deposited by APS and EB-PVD for Thermal Barrier Coatings**  
Y. Oh\*, K. Kwak, K. Choi, B. Shim, Y. Yang, S. Kim, S. Lee, H. Kim, KICET (Korea Institute of Ceramic Engineering & Technology), Republic of Korea

## S3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

### Cell and Stack Development

Room: Coquina Salon E

Session Chairs: Narottam Bansal, NASA Glenn Research Center; Prabhakar Singh, Connecticut Global Fuel Center

**1:30 PM**

**(ICACC-S3-001-2011) Recent development of SOFC cell and stack at NTT (Invited)**  
R. Chiba\*, NTT, Japan

**2:00 PM**

**(ICACC-S3-002-2011) US Department of Energy SECA Program – Overview and Accomplishments (Invited)**  
S. D. Vora\*, US Department of Energy, USA

**2:30 PM**

**(ICACC-S3-003-2011) Thickfilm and multilayer ceramic technology for innovative fuel cell systems (Invited)**  
A. Michaelis\*, Fraunhofer Institute, Germany

**3:00 PM**

Break

### Novel Cell/Stack Design and Processing

Room: Coquina Salon E

Session Chairs: Prabhakar Singh, Connecticut Global Fuel Center; Narottam Bansal, NASA Glenn Research Center

**3:20 PM**

**(ICACC-S3-004-2011) Production of current collector supported micro – tubular solid oxide fuel cells with sacrificial inner core**  
R. De la Torre Garcia, M. Casarin, V. M. Sglavo\*, University of Trento, Italy

**3:40 PM**

**(ICACC-S3-005-2011) Novel Planar Concept for SOFC**  
A. Demin\*, H. Nabelek, D. Bronin, Solid Cell Inc, USA; S. Ghosh, RocCera LLC, USA

**4:00 PM**

**(ICACC-S3-006-2011) Liquid Tin Anode Advanced Cell Development Performance for Direct Fuel Conversion of Liquid and Solid Fuels**  
M. Koslowski\*, J. Brodie, T. Tao, M. Slaney, L. Bateman, CellTech Power, LLC, USA

**4:20 PM**

**(ICACC-S3-007-2011) Low Cost Process for SOFC Components (Invited)**  
M. Han\*, Z. Liu, Z. Lei, S. Song, China University of Mining and Technology, Beijing, China

**4:50 PM**

**(ICACC-S3-008-2011) Advanced Manufacturing Technology for Solid Oxide Fuel Cells**  
N. H. Menzler\*, W. Schafbauer, R. Mücke, R. Kauert, O. Büchler, H. Buchkremer, D. Stöver, Forschungszentrum Jülich, Germany

**5:10 PM**

**(ICACC-S3-009-2011) Reactive magnetron sputtering of dense electrolyte layers for intermediate temperature SOFC application**  
R. Nédélec\*, S. Uhlenbruck, D. Sebold, V. Haanappel, H. Buchkremer, D. Stöver, Forschungszentrum Jülich GmbH, Germany

**5:30 PM**

**(ICACC-S3-010-2011) Characteristics of Thin Films for SOFC Prepared by Aerosol Deposition Method**  
D. Park\*, J. Choi, Korea Institute of Materials Science, Republic of Korea; B. Seong, RIST, Republic of Korea; J. Choi, B. Hahn, J. Ryu, W. Yoon, J. Kim, Korea Institute of Materials Science, Republic of Korea

### S4: Armor Ceramics

#### Phenomenology and Mechanics of Ceramics Subjected to Ballistic Impact I

Room: Coquina Salon D

Session Chair: Jeffrey Swab, US Army Research Lab

**1:30 PM**

**(ICACC-S4-001-2011) Nonlinear Granular Protectors (Invited)**  
C. Daraio\*, California Institute of Technology, USA

**2:00 PM**

**(ICACC-S4-002-2011) Influence of scale and confinement on the transition from interface defeat to penetration (Invited)**  
P. Lundberg\*, R. Renstrom, O. Andersson, Swedish Defence Research Agency, FOI, Sweden

**2:30 PM**

**(ICACC-S4-003-2011) 2011 Overview of the Development of Ceramic Armor Technology: Past, Present and the Future**  
W. A. Gooch\*, US Army Research Laboratory, USA

2:50 PM

Break

3:10 PM

**(ICACC-S4-004-2011) Characterization of Subsurface Damage Zone in SiC and Si<sub>3</sub>N<sub>4</sub> Ceramics with Static and Dynamic Indentation (Invited)**

J. Kim, Research Institute of Industrial Science & Technology (RIST), Republic of Korea; D. Kim\*, KAIST, Republic of Korea

3:40 PM

**(ICACC-S4-005-2011) Windows for spacecraft and military vehicles (Invited)**

D. A. Shockey\*, SRI international, USA

4:10 PM

**(ICACC-S4-006-2011) Impact Strength of Glass for Armor Applications (Invited)**

X. Nie, H. Park, W. W. Chen\*, Purdue University, USA

4:40 PM

**(ICACC-S4-007-2011) Post-mortem analysis of fragments from SiC ceramics after ballistic test**

S. Ghosh\*, H. Wu, Loughborough University, United Kingdom

5:00 PM

**(ICACC-S4-008-2011) Spall Strengths of Two Silicon Nitrides**

D. Casem\*, D. Dandekar, US Army Research Laboratory, USA; V. Prakash, Y. Motoyashiki, Case Western Reserve University, USA; E. Sato, Japan Aerospace Exploration Agency, Japan

5:20 PM

**(ICACC-S4-009-2011) Deformation and fracture processes in alumina samples indented at high and low strain rates**

C. J. Dancer\*, H. M. Curtis, S. Bennett, S. Falco, C. R. Siviour, N. Petrinic, R. I. Todd, University of Oxford, United Kingdom

5:40 PM

**(ICACC-S4-010-2011) Damage Propagation Due to Interacting Vickers Indentations on the Basal (c) and Pyramidal (a) Planes of Single Crystal Sapphire: Implications to Multi Hit Resistance**

E. J. Haney, G. Subhash\*, University of Florida, USA

## S8: 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT) in honor of Professor Katsutoshi Komeya

### In Honor of Professor Komeya

Room: Coquina Salon B

Session Chairs: Hasan Mandal, Anadolu University; Makio Naito, Osaka University

1:30 PM

**(ICACC-S8-001-2011) Half Century Research Life on Nitride Ceramics (Invited)**

K. Komeya\*, Yokohama National University, Japan

2:00 PM

**(ICACC-S8-002-2011) Interfacial Adsorption Behavior of Rare Earths in Si<sub>3</sub>N<sub>4</sub> Ceramics and The Impact on Microstructure Evolution (Invited)**

P. Becher\*, Oak Ridge National Laboratory, USA

2:20 PM

**(ICACC-S8-003-2011) Novel Synthetic Routes of Ceria Porous Spheres for Catalytic Application (Invited)**

J. Hojo\*, M. Inada, N. Enomoto, Kyushu University, Japan

2:40 PM

**(ICACC-S8-004-2011) Comparison of Microwave and Conventionally Sintered Ytria Doped Zirconia Ceramics and Hydroxyapatite-Zirconia nanocomposites (Invited)**

S. Hampshire\*, C. J. Reidy, D. Curran, T. J. Fleming, University of Limerick, Ireland; M. R. Towler, Alfred University, USA

3:00 PM

Break

3:20 PM

**(ICACC-S8-005-2011) Soft Processing for Ceramics: Single-Step Fabrication of Nano-Structured Oxide Ceramics (Particles, Films, Integrated Layers and Patterns) from Solution without Firing (Invited)**

M. Yoshimura\*, Tokyo Institute of Technology, Japan

3:40 PM

**(ICACC-S8-006-2011) Parameters Affecting Grain Boundary Chemistry of SIALON Ceramics (Invited)**

H. Mandal\*, Anadolu University, Turkey; N. Calis Acikbas, MDA Advanced Ceramics, Turkey; F. Kara, A. Kara, S. Turan, H. Yurdakul, Anadolu University, Turkey; B. Bitterlich, CeramTec AG, Germany

4:00 PM

**(ICACC-S8-007-2011) Surface Modification of Powder for Sintering by Rotary Chemical Vapor Deposition (Invited)**

T. Goto\*, IMR Tohoku University, Japan

4:20 PM

**(ICACC-S8-008-2011) Corrosion of silicon nitride based ceramics under sub-critical conditions in aqueous sodium chloride solution (Invited)**

P. Sajgalik\*, Institute of Inorganic Chemistry SAS, Slovakia; D. Galusková, Vitrum Lasugaricio - Joint Glass Centre, Slovakia

4:40 PM

**(ICACC-S8-009-2011) Recent Developments in High Thermal Conductivity Silicon Nitride Ceramics (Invited)**

K. Hirao\*, Y. Zhou, H. Hyuga, National Institute of Advanced Industrial Science & Technology (AIST), Japan; D. Kusano, Japan Fine Ceramics Co., Ltd., Japan

5:00 PM

**(ICACC-S8-010-2011) Manufacturing and Mechanical Behaviour of MMCs Produced by Liquid Metal Infiltration of Freeze-Casted Ceramic Performs (Invited)**

M. J. Hoffmann\*, T. Waschkes, R. Oberacker, KIT, Germany

5:20 PM

**(ICACC-S8-011-2011) ZrB<sub>2</sub>-based Ultra High Temperature Ceramics (UHTCs) by Arc Melting Process (Invited)**

Y. Seong, S. Lee, D. Kim\*, KAIST, Republic of Korea

5:40 PM

**(ICACC-S8-012-2011) Smart Powder Processing for Energy and Environments (Invited)**

M. Naito\*, H. Abe, A. Kondo, Osaka University, Japan

## S9: Porous Ceramics: Novel Developments and Applications

### Processing Methods for Porous Ceramics I

Room: Coquina Salon H

Session Chair: Paolo Colombo, Università di Padova

1:30 PM

**(ICACC-S9-001-2011) Porous and Nanostructured Nitrides and Carbides (Invited)**

S. Kaskel\*, TU Dresden, Germany

**2:00 PM****(ICACC-S9-002-2011) From porous ceramics to mesoporous hollow microcapsules: an insight into the world of particle stabilization**

U. T. Gonzenbach\*, F. Krauss Juillierat, P. N. Sturzenegger, B. S. Seeber, M. Mücklich, L. J. Gauckler, ETH Zürich, Switzerland

**2:20 PM****(ICACC-S9-003-2011) The fabrication and characterization of porous sintered reaction-bonded silicon nitrides with wide pore channels**

Y. Park\*, J. Lee, H. Yoon, I. Song, Korea Institute of Materials Science, Republic of Korea

**2:40 PM****(ICACC-S9-004-2011) Influence of sintering conditions on the microstructure and properties of particle-stabilized porous ceramics**

B. S. Seeber\*, U. T. Gonzenbach, B. Hartmeier, U. Ebner, L. J. Gauckler, ETH Zürich, Switzerland

**3:00 PM****Break****Processing Methods for Porous Ceramics II**

Room: Coquina Salon H

Session Chair: Dilip Chatterjee, Oxane Materials

**3:20 PM****(ICACC-S9-005-2011) Precursors-derived microporous ceramic membranes for gas separation (Invited)**

Y. Iwamoto\*, Nagoya Institute of Technology, Japan

**3:50 PM****(ICACC-S9-006-2011) Porous 3D ceramic structures formed using a modified weaving technique**

S. Matthews\*, J. Matthews, SCF Processing Ltd, Ireland

**4:10 PM****(ICACC-S9-007-2011) Structure and Properties of Sintered Kaolinite-Silica Nanocomposites**

J. Walz\*, W. Li, K. Lu, Virginia Tech, USA

**4:30 PM****(ICACC-S9-008-2011) Fabrication of ceramic/metal functionally graded composite using a novel combination of freeze casting and electrophoretic deposition and vacuum casting**

A. Preiss\*, B. Su, University of Bristol, United Kingdom; S. Collins, P. Ellison, Corin Ltd., United Kingdom

**4:50 PM****(ICACC-S9-009-2011) Porous SiC - reticulated ceramic from wood charcoal**

L. M. Manocha, S. Manocha\*, H. Patel, Sardar Patel University, India

**5:10 PM****(ICACC-S9-010-2011) Fabrication of beta-cristobalite porous material from diatomite with some impurities**

O. San\*, C. -. Özgür, Dumlupinar University, Turkey

**5:30 PM****(ICACC-S9-011-2011) Water contact angle measures for glassy membrane filters**

O. San\*, Dumlupinar University, Turkey; C. Karaguzel, Dumlupinar Univ, Turkey; R. Goren, Dumlupinar University, Turkey

**5:50 PM****(ICACC-S9-012-2011) Transformations and Micro-Mechanical Instability Behavior in Zirconia-based Porous Ceramic**

S. Kulkov\*, S. Buyakova, Institute of Strength Physics and Material Sciences RAS and Tomsk State University, Russian Federation

**S11: Advanced Sensor Technology, Developments and Applications****Advanced Sensor Technology**

Room: Coquina Salon C

Session Chair: Linan An, University of Central Florida

**1:30 PM****(ICACC-S11-001-2011) Electrochemical sensing of dopamine over polyindole- composite Electrode (Invited)**

P. C. Pandey, S. Kumari\*, A. P. Mishra, Banaras Hindu University, Institute of Technology, India

**2:00 PM****(ICACC-S11-002-2011) Polyaniline-TCNQ nanocomposite, Application in Electrocatalysis of acetylthiocholine, (Invited)**

P. C. Pandey\*, S. Kumari, Banaras Hindu University, Institute of Technology, India

**2:30 PM****(ICACC-S11-003-2011) Recent Advances on Wireless Passive High-Temperature Sensors for Harsh Environments (Invited)**

X. Gong\*, L. An, C. Xu, University of Central Florida, USA

**3:00 PM****Break****3:20 PM****(ICACC-S11-004-2011) Polymer derived SiCN pressure sensors**

Y. Wang\*, Northwestern Polytechnical University, China; L. An, Advanced Materials Processing and Analysis Center, USA

**3:40 PM****(ICACC-S11-005-2011) Nano-Calorimeter Platform for Explosives Sensing**

S. Kang, N. Niedbalski, M. R. Lane, D. Banerjee\*, Texas A&M University, USA

**4:00 PM****(ICACC-S11-006-2011) Thick Films for Piezoelectric Sensor**

D. Park\*, J. Ryu, W. Yoon, J. Choi, B. Hahn, J. Kim, J. Choi, B. Lee, Korea Institute of Materials Science, Republic of Korea

**4:20 PM****(ICACC-S11-007-2011) High Temperature Stability of Thin Film Thermocouples and Strain Gauges in the System In-O-N**

O. J. Gregory, M. Amani\*, University of Rhode Island, USA

**4:40 PM****(ICACC-S11-008-2011) Development of Sensor Materials for On-line Process Monitoring**

J. Jue\*, S. Herrmann, S. Herbst, S. Li, Idaho National Laboratory, USA; S. Gopalan, Boston University, USA

**S14: Advanced Materials and Technologies for Rechargeable Batteries****Advanced Materials for Lithium-ion Batteries**

Room: Coquina Salon F

Session Chairs: Ilias Belharouak, Argonne National Lab; Shirley Meng, University of California, San Diego

**1:30 PM****(ICACC-S14-001-2011) Present Status of the Lithium-Ion Cell Manufacturing in the U.S (Invited)**

R. J. Brodd\*, Kentucky Argonne Battery Manufacturing Research and Development Center, USA

**2:00 PM****(ICACC-S14-002-2011) Synchrotron imaging of the lithium battery electrodes during their functioning (Invited)**

G. Ouvrard\*, M. Zerrouki, B. Lestriez, P. Soudan, Institut des Matériaux Jean Rouxel, France; C. Masquelier, S. Hamelet, M. Morcrette, J. Lesage, Laboratoire de Réactivité et de Chimie des Solides, France; S. Belin, A. Flank, Synchrotron Soleil, France

**2:30 PM**

**(ICACC-S14-003-2011) Advanced High Capacity Materials for Automotive Lithium-Ion Battery Applications (Invited)**

K. Amine\*, Argonne National Lab, USA

**3:00 PM**

**Break**

**3:20 PM**

**(ICACC-S14-004-2011) Advanced positive electrode materials for Li-ion batteries: overlithiated layered oxides and Tavorite-type phosphates (Invited)**

C. Laurence\*, J. Bains, ICMCB-CNRS and IPB-ENSCBP, France; N. Marx, ICMCB-CNRS, France; D. Carlier, ICMCB-CNRS and IPB-ENSCBP, France; L. Bourgeois, Université de Bordeaux-ISM and IPB-ENSCBP, France; A. Wattiaux, ICMCB-CNRS, France; C. Delmas, ICMCB-CNRS and IPB-ENSCBP, France

**3:50 PM**

**(ICACC-S14-005-2011) Probing nano-scale structural and electronic properties of lithium electrodes using electron microscopy and EELS (Invited)**

F. Wang, M. Moreno, L. Wu, Y. Zhu, V. Volkov, J. Graetz\*, Brookhaven National Laboratory, USA

**4:20 PM**

**(ICACC-S14-006-2011) Structural characteristics and electrochemical performance of layered "Li-excess" Oxide Electrode materials  $\text{Li}[\text{Li}_{1/3-2x}/3\text{Ni}_x\text{Mn}_{2/3-x}/3]\text{O}_2$  ( $x=1/3, 1/4$  and  $1/5$ )**

C. R. Fell\*, University of Florida, USA; Y. S. Meng, K. Carroll, University of California San Diego, USA

**4:40 PM**

**(ICACC-S14-007-2011) Graphene - $\text{LiFePO}_4$  Nanocomposite Cathode For Lithium Ion Batteries**

A. Kumar\*, C. Venkateswara Rao, R. Thomas, Institute for Functional Nanomaterials, University of Puerto Rico, USA; M. S. Tomar, University of Puerto Rico, USA; Y. Ishikawab, R. S. Katiyar, Institute for Functional Nanomaterials, University of Puerto Rico, USA

**5:00 PM**

**(ICACC-S14-008-2011) Lithium storage in graphene nanoribbons**

V. Barone\*, B. Fahlman, A. Antic, T. Bhardwaj, C. Uthaisar, Central Michigan University, USA

**5:20 PM**

**(ICACC-S14-009-2011) Nanostructured electrodes for high power lithium-ion batteries**

J. Schorr, S. Sengupta\*, R. Revur, MetaMateria Technologies, USA

**Pacific Rim Engineering Ceramics Summit**

**Pacific Rim Engineering Ceramics Summit I**

Room: Ponce de Leon

Session Chairs: Yu Zhou, Harbin Institute of Technology; Mrityunjay Singh, Ohio Aerospace Institute

**1:30 PM**

**(ICACC-PACRIM-001-2011) Need for Green Materials Selection and Manufacturing Education and Research (Invited)**

R. D. Sisson\*, Worcester Polytechnic Institute, USA

**2:00 PM**

**(ICACC-PACRIM-002-2011) Ceramics Researches and Education in P.R. China (Invited)**

Y. Zhou\*, D. Jia, Z. Yang, Harbin Institute of Technology, China

**2:30 PM**

**(ICACC-PACRIM-003-2011) Current Status and Future Challenges of Multifunctional coatings for energy and environmental systems in Taiwan (Invited)**

J. Huang\*, C. Fan, J. Song, M. Wu, National Cheng Kung University, Taiwan

**3:00 PM**

**Break**

**3:20 PM**

**(ICACC-PACRIM-004-2011) Current Status of Research & Technology Development in the Areas of Ceramics, CMCs and Ceramic Coatings (Invited)**

G. Sundararajan\*, Y. R. Mahajan, Int. Adv. Res. Centre for Powder Metallurgy & New Materials (ARCI), India

**3:50 PM**

**(ICACC-PACRIM-005-2011) Research Status of Carbon/carbon Composites in China (Invited)**

H. Li\*, S. Zhang, Q. Fu, K. Li, Northwestern Polytechnical University, China

**4:20 PM**

**(ICACC-PACRIM-006-2011) Photocatalytic Fibers with High Quantum Efficiency (Invited)**

T. Ishikawa\*, Ube Industries, Ltd., Japan

**4:50 PM**

**(ICACC-PACRIM-007-2011) Development of Silicon carbide Fibers in Korea: One-pot Process for Aluminum Doping of Polycarbosilane in the Presence of Solid Acid Catalyst and Low Temperature Halide Gas Curing Process (Invited)**

D. G. Shin, K. Y. Cho, Seoul National University of Technology, Republic of Korea; E. B. Park, Korea Institute of Ceramic Engineering and Technology, Republic of Korea; Y. H. Kim, J. S. Hong, H. R. Lim, Y. R. Cho, M. S. Kang, D. Riu\*, Seoul National University of Technology, Republic of Korea

**5:20 PM**

**(ICACC-PACRIM-008-2011) Silicon Nitride Ceramics for Turbine Engine Applications (Invited)**

H. Lin\*, Oak Ridge National Laboratory, USA

**Tuesday, January 25, 2011**

**S1: Mechanical Behavior and Performance of Ceramics & Composites**

**Reliability and Life Prediction Methodologies**

Room: Coquina Salon A

Session Chair: Jonathan Salem, NASA Glenn Research Center

**8:00 AM**

**(ICACC-S1-013-2011) Orbiter Window Hypervelocity Impact Strength Evaluation (Invited)**

L. Estes\*, NASA/JSC, USA

**8:30 AM**

**(ICACC-S1-014-2011) Use of Modern Statistical Techniques in the Prediction of Brittle Failure**

S. Freiman\*, Freiman Consulting, USA; J. Fong, NIST, USA

**8:50 AM**

**(ICACC-S1-015-2011) Unit Sphere Stochastic-Strength Failure Criterion For Anisotropic Brittle Materials**

N. N. Nemeth\*, NASA Glenn Research Center, USA

**9:10 AM**

**(ICACC-S1-016-2011) Deformation and strength evaluation of SiC/SiC composites using Distributed-Micro-Crack Model**

H. Baba\*, IHI Corporation, Japan; A. Suzuki, Oita University, Japan

**9:30 AM**

**Break**

**9:50 AM**

**(ICACC-S1-017-2011) Fatigue threshold R-curves for fatigue reliability predictions in grain bridging ceramics**

S. Gallops\*, J. J. Kruzic, Oregon State University, USA; T. Fett, University of Karlsruhe, Germany

10:10 AM

**(ICACC-S1-018-2011) High Reliability Alumina-Silicon Carbide Laminated Composites**

F. De Genua, V. M. Sglavo\*, University of Trento - Italy, Italy

**Nondestructive Evaluation**

Room: Coquina Salon A

Session Chair: Jiangang Sun, Argonne National Laboratory

10:50 AM

**(ICACC-S1-019-2011) Nondestructive Evaluation of Ceramic Materials by Thermal Tomography**

J. Sun\*, Argonne National Laboratory, USA

11:10 AM

**(ICACC-S1-020-2011) Identification of damage modes in ceramic matrix composites by acoustic emission**

N. Godin, M. R'Mili, P. Reynaud, G. Fantozzi, J. Lamon\*, MATEIS-INSA de Lyon, France

11:30 AM

**(ICACC-S1-021-2011) Comparison of Synchrotron Radiation X-ray tomography with novel Lab based CTs in 3D microstructures and porosity characterization**

S. H. Lau\*, L. Hunter, T. Fong, J. Gelb, A. Gu, W. Yun, Xradia Inc., USA

11:50 AM

**(ICACC-S1-022-2011) An Indentation Based Non-Destructive Evaluation Technique for Thermal Barrier Coating Spallation Prediction**

J. M. Tannenbaum\*, K. Lee, B. S. Kang, West Virginia University, USA; M. Alvin, National Energy Technology Laboratory, USA

**S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications****Thermal Barrier Coatings II**

Room: Coquina Salon G

Session Chairs: Robert Vassen, IEF-1; Bryan Harder, Northwestern University

8:00 AM

**(ICACC-S2-013-2011) Damage development characterisation in thermal barrier coatings (Invited)**

H. Brodin\*, Siemens Industrial Turbomachinery AB, Sweden; S. Sjöström, S. Johansson, Linköping University, Sweden

8:30 AM

**(ICACC-S2-014-2011) Effects of ageing on mechanical properties and damage behavior of EB-PVD thermal barrier coating systems (Invited)**

M. Bartsch\*, L. Chernova, N. Dzodzovic, German Aerospace Center (DLR), Germany; M. T. Hernandez, A. M. Karlsson, University of Delaware, USA; N. Zotov, G. Eggeler, Ruhr-Universität Bochum, Germany

9:00 AM

**(ICACC-S2-015-2011) Stress evolution and microstructure relationship in plasma-sprayed ceramic coatings**

K. Shinoda\*, J. Colmenares-Angulo, G. Dwivedi, T. Nakamura, C. A. Johnson, S. Sampath, Stony Brook University, USA

9:20 AM

**(ICACC-S2-016-2011) Characteristic Micro-scale Damage Evolution Behavior in EB-PVD TBC System under Out-of-phase Thermo-mechanical Fatigue Tests**

R. Kitazawa\*, Y. Kagawa, The University of Tokyo, Japan

9:40 AM

Break

10:00 AM

**(ICACC-S2-017-2011) The Effect of a Thermal Gradient on the Performance of CMAS Infiltrated TBCs**

R. Jackson\*, E. M. Zaleski, E. Veron-Tocquet, C. G. Levi, University of California, Santa Barbara, USA

10:20 AM

**(ICACC-S2-018-2011) Variation of creep properties and interfacial roughness in thermal barrier coating systems**

P. Seiler\*, TU Braunschweig, Germany; M. Schweda, IEF-2, Germany; M. Bäker, J. Rösler, TU Braunschweig, Germany; T. Beck, IEF-2, Germany

10:40 AM

**(ICACC-S2-019-2011) Investigation into delamination of air plasma sprayed thermal barrier coatings after thermal treatments**

A. Shinmi\*, X. Zhao, P. Xiao, University of Manchester, United Kingdom; N. Markocsan, P. Nylen, University West, Sweden

11:00 AM

**(ICACC-S2-020-2011) Microstructure and thermal cycling lifetime of plasma sprayed Lanthanum-Lithium-hexaaluminate for use in thermal barrier coatings**

D. E. Mack\*, A. Guignard, G. Mauer, Forschungszentrum Jülich GmbH, Germany; N. Melendez, University of Alberta, Canada; D. Sebold, R. Vassen, D. Stöver, Forschungszentrum Jülich GmbH, Germany

**S3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology****Electrodes I**

Room: Coquina Salon E

Session Chairs: Meilin Liu, Georgia Tech; Mihails Kusnezoff, Fraunhofer IKTS

8:00 AM

**(ICACC-S3-011-2011) Electrochemical phenomena in MEA electrodes (Invited)**

M. Kusnezoff\*, N. Trofimenko, S. Mosch, A. Michaelis, Fraunhofer Institute for Ceramic Technologies and Systems, Germany

8:30 AM

**(ICACC-S3-012-2011) Doped CeO<sub>2</sub> and LaFeO<sub>3</sub> Composite Oxide Anode for Direct Hydrocarbon type SOFCs (Invited)**

T. Ishihara\*, T. Shin, S. Ida, Kyushu University, Japan

9:00 AM

**(ICACC-S3-013-2011) Effect of Microstructural Evolution of Anodes with Various Pore Formers on Electrochemical Performance of SOFC**

A. Sariikaya\*, F. Dogan, Missouri University of Science and Technology, USA

9:20 AM

**(ICACC-S3-014-2011) A-site Doping of Double Perovskites in SOFC's**

C. P. Kuhnell\*, T. G. Howell, T. J. Bock, M. A. Rottmayer, T. L. Reitz, AFRL/RZPS, USA

9:40 AM

Break

10:00 AM

**(ICACC-S3-016-2011) Microanalyses of Surfaces and Interfaces in Catalyst-Infiltrated LSCF Cathodes (Invited)**

W. Qin, M. Liu, M. Lynch, J. Choi, M. Liu\*, Georgia Institute of Technology, USA

10:30 AM

**(ICACC-S3-017-2011) PrBa<sub>0.5</sub>Sr<sub>0.5</sub>Co<sub>2</sub>O<sub>5+δ</sub> layered perovskite cathode for intermediate temperature solid oxide fuel cells**

X. Xue\*, H. Ding, University of South Carolina, USA

**10:50 AM**

**(ICACC-S3-018-2011) Development of Low Thermal Expansion  $\text{Ca}_2\text{Fe}_2\text{O}_5$  Cathode Materials for Solid Oxide Fuel Cells**  
S. Lee\*, D. Kim, D. Kim, KAIST, Republic of Korea

**11:10 AM**

**(ICACC-S3-019-2011) The Effect of A-site Stoichiometry on LSCF Cathode Performance and Stability**  
J. Hardy, J. W. Templeton\*, Z. Lu, J. W. Stevenson, Pacific Northwest National Laboratory, USA

## S4: Armor Ceramics

### Phenomenology and Mechanics of Ceramics Subjected to Ballistic Impact II

Room: Coquina Salon D

Session Chair: David Stepp, Army Research Office

**8:00 AM**

**(ICACC-S4-011-2011) Depth-of-Penetration Experiments on Transparent Materials**  
S. Bless\*, The University of Texas at Austin, USA

**8:20 AM**

**(ICACC-S4-012-2011) Constitutive Response of Intact and Pre-Damaged Soda-Lime Glass**  
C. E. Anderson\*, S. Chocron, A. E. Nicholls, K. A. Dannemann, Southwest Research Institute, USA

**8:40 AM**

**(ICACC-S4-013-2011) Analysis of the fragmentation of spinel under ballistic impact**  
E. Strassburger\*, M. Hunzinger, Fraunhofer EMI, Germany; P. Patel, J. W. McCauley, U.S. Army Research Laboratory, USA

**9:00 AM**

**(ICACC-S4-014-2011) Effect of Acoustic Impedance Mismatch on Fragmentation in Bilayers**  
E. A. Gamble\*, B. G. Compton, F. W. Zok, University of California, Santa Barbara, USA

**9:20 AM**

**(ICACC-S4-015-2011) Elastic-Plastic Indentation Response of Two Transparent Fine-Grained Polycrystalline Spinel**  
A. M. Muller\*, D. J. Green, The Pennsylvania State University, USA

**9:40 AM**

Break

### High-Rate Real-Time Characterization

Room: Coquina Salon D

Session Chair: David Stepp, Army Research Office

**10:00 AM**

**(ICACC-S4-016-2011) Use of Real-Time X-ray Diffraction Measurements to Examine Shocked Solids at the Microscopic Level (Invited)**  
Y. M. Gupta\*, Washington State University, USA

**10:30 AM**

**(ICACC-S4-017-2011) The strength and failure of ceramics at very high strain rates**  
G. Hu\*, J. Kimberley, K. Ramesh, Johns Hopkins Uni., USA; J. McCauley, Army Research Laboratory, USA

**10:50 AM**

**(ICACC-S4-018-2011) The Influence of Temperature and Confinement Pressure on Dynamic Response of Damaged Borosilicate Glass**  
X. Nie\*, W. Chen, Purdue University, USA

**11:10 AM**

**(ICACC-S4-019-2011) Comparison of Damage Propagation Due to High Velocity Ball Impact on Unstrengthened and Chemically Strengthened Glasses**  
G. Subhash\*, University of Florida, USA

**11:30 AM**

**(ICACC-S4-020-2011) The strain-rate dependence of the hardness of AlN doped SiC**  
L. J. Vandeperre\*, N. Ur-rehman, Imperial College London, United Kingdom; P. Brown, Defence Science and Technology Laboratory, United Kingdom

**11:50 AM**

**(ICACC-S4-021-2011) The Effect of Interfacial Toughness on Energy Absorption during Ballistic Impact of Ceramic-Composite Bi-layers**  
E. K. Oberg\*, T. W. Clyne, University of Cambridge, United Kingdom; H. Specht, TenCate Advanced Armour, Denmark

## S7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications

### Nanostructured Membranes, Thin Films, Functional Coatings

Room: Coquina Salon C

Session Chairs: Suprakas Sinha Ray, Council for Scientific and Industrial Research; Sanjay Mathur, University of Cologne

**8:00 AM**

**(ICACC-S7-001-2011) Thin Film Ferrites by ALD for Solar Thermal Water Splitting Redox Cycles**  
J. R. Scheffe, University of Colorado, USA; A. H. McDaniel, M. D. Allendorf, E. N. Coker, Sandia National Laboratories, USA; A. W. Weimer\*, University of Colorado, USA

**8:20 AM**

**(ICACC-S7-002-2011) Dye Sensitized Solar Cells Employing Nb-doped  $\text{TiO}_2$ /Al-doped ZnO Transparent Conducting Multilayer Films**  
J. Noh\*, H. Han, S. Lee, D. Kim, J. Park, S. Park, K. Hong, Seoul National University, Republic of Korea

**8:40 AM**

**(ICACC-S7-003-2011) Doped  $\text{TiO}_2$ -Nanotubular Sensor Electrodes for Gas Sensing Applications**  
B. Saruhan-Brings\*, Y. Gönüllü, A. Yüce, G. C. Mondragon Rodriguez, German Aerospace Center, Germany

**9:00 AM**

**(ICACC-S7-004-2011) Nanostructured Gas Separation Membranes**  
R. Prasad\*, M. Bazarjani, A. Gurlo, R. Riedel, Technische Universität Darmstadt, Germany

**9:20 AM**

**(ICACC-S7-005-2011) Rare Earth Scandates and Interlanthanide Oxides for DRAM Capacitor Applications**  
S. P. Pavunny, R. Thomas\*, R. S. Katiyar, University of Puerto Rico, USA

**9:40 AM**

Break

**10:00 AM**

**(ICACC-S7-006-2011) Mechanical Properties and Microstructure Evaluation of Spark Plasma Sintered  $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$ -TiCN Nanocomposites (Invited)**  
G. Sundararajan\*, D. Chakravarty, Int. Adv. Res. Centre for Powder Metallurgy & New Materials (ARCI), India

**10:30 AM****(ICACC-S7-008-2011) The Effect of Synthesis Parameters on the size of Carbon Spheres Produced by Chemical Vapour Deposition without a Catalyst**

I. Sibiya\*, S. K. Pillai, Council for Scientific and Industrial Research, South Africa; S. D. Mhlanga, University of the Witwatersrand, South Africa; S. Sinha Ray, Council for Scientific and Industrial Research, South Africa

**10:50 AM****(ICACC-S7-009-2011) Effects of 120 MeV Ag<sup>9+</sup> and 100 MeV Si<sup>8+</sup> ions irradiation on Photoelectrochemical Properties of Nanocrystalline Strontium Titanate Thin Films**

J. Shrivastava, S. Upadhyay, N. Singh, V. Sharma, P. Kumar, V. R. Satsangi, R. Shrivastav, S. Dass\*, Dayalbagh Educational Institute, India

**11:10 AM****(ICACC-S7-010-2011) Wear properties of nano-composite MoN-5, 10, 20 at. % Cu coatings deposited by reactive magnetron sputtering with single alloying target**

K. Moon\*, H. Lee, D. Jung, S. Shin, Korea Institute of Industrial Technology, Republic of Korea

## S8: 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT) in honor of Professor Katsutoshi Komeya

**Novel Forming and Sintering I**

Room: Coquina Salon B

Session Chairs: Rainer Gadow, IFKB University of Stuttgart; Eugene Medvedovski, Umicore Indium Products

**8:00 AM****(ICACC-S8-013-2011) Ceramic injection molding of alumina-silicon carbide nanocomposites (Invited)**

R. Gadow\*, F. Kern, IFKB University of Stuttgart, Germany

**8:30 AM****(ICACC-S8-014-2011) Tunable Thermoreversible Gels for Casting Processes (Invited)**

K. T. Faber\*, N. O. Shanti, M. E. Seitz, Northwestern University, USA

**9:00 AM****(ICACC-S8-015-2011) Injection Molding Alumina Suspension Gels at Room Temperature**

V. L. Wiesner\*, J. P. Youngblood, R. W. Trice, Purdue University, USA

**9:20 AM****(ICACC-S8-016-2011) The Mechanisms and Kinetics of AlN Powder Hydrolysis**

A. Kocjan\*, A. Dakskobler, K. Krnel, T. Kosmac, Jozef Stefan Institute, Slovenia

**9:40 AM****Break****10:00 AM****(ICACC-S8-017-2011) Large Size Structural Ceramic Manufacturing by the Shaping of Thixotropic Slurries**

E. Medvedovski\*, Umicore Thin Film Products, USA

**10:20 AM****(ICACC-S8-018-2011) A Forming Technique to Produce Spherical Ceramic Beads Using Alginate Acid, Sodium Alginate and Ammonium Alginate**

C. J. Espinoza\*, T. Wei, B. Cho, W. M. Kriven, University of Illinois at Urbana Champaign, USA

**10:40 AM****(ICACC-S8-019-2011) The Effect of Texturing Techniques on the Permeability and Permittivity spectra of Sintered Single Phase Ba<sub>3</sub>Co<sub>2</sub>Fe<sub>24</sub>O<sub>41</sub> (Co<sub>2</sub>Z) Hexaferrite Ceramics for magneto-dielectric antenna applications**

M. D. Hill\*, D. Cruickshank, Trans-Tech Inc., USA

**11:00 AM****(ICACC-S8-020-2011) Oriented alumina ceramics prepared from colloidal processing in magnetic field**

S. Tanaka\*, R. Furushima, Z. Kato, K. Uematsu, Nagaoka University of Technology, Japan

**11:20 AM****(ICACC-S8-021-2011) Servo Motor Drive Press for Uniaxial Compacting**

W. Schuebl\*, H. Schmidt, Dorst Technologies, Germany

**11:40 AM****(ICACC-S8-022-2011) Preparation of MgSiN<sub>2</sub>-based Phosphors by Combustion Synthesis**

Y. Zhou\*, National Institute of Advanced Industrial Science and Technology (AIST), Japan; D. Wakimoto, Nagoya Institute of Technology, Japan; Y. Yoshizawa, K. Hirao, National Institute of Advanced Industrial Science and Technology (AIST), Japan; S. Hashimoto, Y. Iwamoto, Nagoya Institute of Technology, Japan

## S9: Porous Ceramics: Novel Developments and Applications

**Structure and Properties of Porous Ceramics I**

Room: Coquina Salon H

Session Chair: James Zimmermann, Corning Incorporated

**8:00 AM****(ICACC-S9-013-2011) High performance SiC foams: properties and applications (Invited)**

A. Ortona\*, SUPSI-CIMSI, Switzerland; S. Gianella, Erbicool SA, Switzerland

**8:30 AM****(ICACC-S9-014-2011) Ceramic Foams with Increased Specific Surface Area**

M. Fukushima\*, National Institute of Advanced Industrial Science and Technology (AIST), Japan; P. Colombo, Università di Padova, Italy

**8:50 AM****(ICACC-S9-015-2011) Biomorphing SiC, from Porous to Solid, by Reactive Infiltration**

J. Narciso\*, N. Rojo-Calderón, Alicante University, Spain

**9:10 AM****(ICACC-S9-016-2011) Preparation and characterization of in-situ anchored Pt NPs into frameworks of mesoporous silica**

H. Lee\*, J. Jeong, J. Yoo, S. Lee, Korea Institute of Ceramic Engineering & Technology, Republic of Korea

**9:30 AM****(ICACC-S9-017-2011) Electrical Properties and Evolving Microstructure of Ceramic Powder Compaction**

T. Pruyt\*, R. Gerhardt, Georgia Institute of Technology, USA

**9:50 AM****Break****Structure and Properties of Porous Ceramics II**

Room: Coquina Salon H

Session Chair: Irene Peterson, Corning Incorporated

**10:10 AM****(ICACC-S9-018-2011) Not all microcracks are born equal: thermal vs mechanical microcracking in porous ceramics (Invited)**

G. Bruno\*, Corning Incorporated, USA; A. M. Efremov, CSC, Russian Federation

**10:40 AM****(ICACC-S9-019-2011) 3D Microstructures and Porosity characterization at Multiscale resolution-transitioning from Synchrotron to Laboratory**

S. H. Lau\*, Xradia Inc., USA; J. McCutcheon, University of Connecticut, USA; A. Gu, L. Hunter, J. Gelb, Xradia Inc., USA

**11:00 AM****(ICACC-S9-020-2011) Alternative Test Coupons for Failure Stress Evaluation of Diesel Particulate Filters**

A. Wereszczak\*, E. Fox, M. Lance, Oak Ridge National Laboratory, USA

**11:20 AM****(ICACC-S9-021-2011) Elevated Temperature Fracture Toughness Behavior of Porous Ceramic Materials**

T. R. Watkins\*, A. Shyam, Oak Ridge National Laboratory, USA; R. J. Stafford, Cummins Inc., USA

**11:40 AM****(ICACC-S9-022-2011) Microstructural Simulation of Mechanical Behaviour of porous CMC matrices by means of a parametric Unit Cell Approach**

H. Richter\*, C. Heinig, M. Bartsch, German Aerospace Center, Germany

**12:00 PM****(ICACC-S9-023-2011) Cell-size effect in cellular ceramics**

T. Fey\*, B. Ceron-Nicolat, P. Grell, University of Erlangen, Germany

**S13: Advanced Ceramics and Composites for Nuclear Fusion Applications****Fuel Ceramics Science and Technology I**

Room: Oceanview

Session Chair: Ping Xiao, University of Manchester

**8:00 AM****(ICACC-S13-001-2011) Zirconium carbide for gas cooled reactor fuels (Invited)**

S. L. Lance\*, Y. Katoh, G. Vasudevamurthy, T. Besmann, Oak Ridge National Laboratory, USA

**8:30 AM****(ICACC-S13-003-2011) Multiphase Ceramics for Nuclear Fuel**

D. Men, University of California, Irvine, USA; M. K. Patel, Los Alamos National Laboratory, USA; M. L. Mecartney\*, University of California, Irvine, USA

**8:50 AM****(ICACC-S13-004-2011) The Influence of Phosphorous on the Growth Morphology of CVD-grown 3C-SiC**

I. J. van Rooyen\*, National Laser Centre, CSIR, South Africa; J. H. Neethling, Nelson Mandela Metropolitan University, South Africa; A. Henry, E. Janzen, Linköping University, Sweden

**9:10 AM****(ICACC-S13-005-2011) Atomistic modeling of Ag diffusion in  $\beta$ -SiC**

I. Szlufarska\*, D. Morgan, S. Khalil, D. Shrader, University of Wisconsin, USA

**9:30 AM****Break****Carbon Materials and Fuel Ceramics**

Room: Oceanview

Session Chair: Jochen Linke, Research Center Juelich

**10:10 AM****(ICACC-S13-006-2011) Prediction of Structural Graphite Strength Loss Due to Oxidation in the Chemical Environment of High Temperature Gas-Cooled Reactor (HTGR) (Invited)**

C. Contescu\*, Oak Ridge National Laboratory, USA

**10:40 AM****(ICACC-S13-007-2011) R&D and irradiation plans for new nuclear grade graphite for application to VHTR**

K. Takizawa\*, K. Kakehashi, T. Fukuda, J. Sumita, Tokai Carbon Co. LTD., Japan; K. Sawa, Japan Atomic Energy Agency, Japan; Y. Katoh, S. L. Lance, Oak Ridge National Laboratory, USA

**11:00 AM****(ICACC-S13-008-2011) Oxidation Behavior and Property Change of Nuclear-Grade C/C Composites**

W. Kim\*, M. Seo, J. Park, Korea Atomic Energy Research Institute, Republic of Korea; J. Sumita, T. Shibata, K. Sawa, Japan Atomic Energy Agency, Japan

**11:20 AM****(ICACC-S13-009-2011) Investigation on Irradiation Effect and Fracture Behavior of C/C Composite for VHTR Application**

J. Sumita\*, T. Shibata, K. Sawa, Japan Atomic Energy Agency, Japan; I. Fujita, Toyo Tanso Co. LTD., Japan; J. Ohashi, Ibsiden Co. LTD., Japan; K. Takizawa, Tokai Carbon Co. LTD., Japan

**11:40 AM****(ICACC-S13-010-2011) High Temperature Strength of Zirconium Carbide Stoichiometric Variants**

G. Vasudevamurthy\*, Y. Katoh, L. L. Snead, Oak Ridge National Laboratory, USA

**S14: Advanced Materials and Technologies for Rechargeable Batteries****Diagnostics and Materials Characterization for Lithium-ion Batteries**

Room: Coquina Salon F

Session Chairs: Khalil Amine, Argonne National Laboratory; Marca Doeff, Lawrence Berkeley National Lab

**8:30 AM****(ICACC-S14-010-2011) Probing the electrochemical processes of Carbon Bismuth Fluorides/Oxyfluorides Nanocomposites as Positive Electrode Materials in Li Ion Batteries via Solid-State NMR and Pair Distribution Function Analysis (Invited)**

L. Du\*, Stony Brook University, USA; K. W. Chapman, Argonne National Laboratory, USA; A. Gmitter, N. Pereira, Rutgers University, USA; P. J. Chupas, Argonne National Laboratory, USA; G. G. Amatuucci, Rutgers University, USA; C. P. Grey, Stony Brook University, USA

**9:00 AM****(ICACC-S14-011-2011) Highly reversible Co<sub>3</sub>O<sub>4</sub>/graphene hybrid anode for lithium rechargeable batteries**

H. Kim\*, D. Seo, S. Kim, J. Kim, K. Kang, KAIST, Republic of Korea

**9:20 AM****(ICACC-S14-012-2011) In-situ electrochemical analysis of  $\text{LiNi}_{0.66}\text{Co}_{0.17}\text{Mn}_{0.17}\text{O}_2$  as a layered cathode material for Lithium-ion batteries**

L. C. Torres\*, J. J. Saavedra-Arias, University of Puerto Rico, USA; A. Manivannan, US DOE/NETL, USA; R. S. Katiyar, University of Puerto Rico, USA

**9:40 AM****Break****10:00 AM****(ICACC-S14-013-2011) Evaluation of redox-active organic structures as an alternative to inorganic electrode materials for greener Li-ion batteries (Invited)**

P. Poizot\*, F. Dolhem, University of Picardie, France

**10:30 AM****(ICACC-S14-014-2011) Liquid Silicon-Based Electrolytes for Li-Ion Batteries**

Z. Zhang\*, Argonne National Laboratory, USA

**10:50 AM****(ICACC-S14-015-2011) Probing Lithium Insertion and Conversion Reactions in a Titanium Hydroxyfluorides**

D. Dambournet\*, R. Gerald, Argonne National Laboratory, USA; C. Labrugere, Institut de Chimie de la Matière Condensée de Bordeaux-CNRS, Université Bordeaux 1., France; N. Penin, Institut de Chimie de la Matière Condensée de Bordeaux-CNRS, Université Bordeaux 1., France; I. Belharouak, K. Amine, Argonne National Laboratory, USA; A. Demourgues, Institut de Chimie de la Matière Condensée de Bordeaux-CNRS, Université Bordeaux 1., France; A. Tressaud, Institut de Chimie de la Matière Condensée de Bordeaux-CNRS, Université Bordeaux 1., France

**11:10 AM****(ICACC-S14-016-2011) Electrochemical Performance of TiO<sub>2</sub> Nanoflakes as an Anode Material for Lithium Ion Batteries**

M. Yang\*, Y. Lee, University of Florida, USA; Y. S. Meng, University of California San Diego, USA; K. Powers, University of Florida, USA

**11:30 AM****(ICACC-S14-017-2011) Studies of Li-ion Battery Materials Using Synchrotron Methods (Invited)**

M. Balasubramanian\*, Argonne National Laboratory, USA

**Pacific Rim Engineering Ceramics Summit****Pacific Rim Engineering Ceramics Summit II**

Room: Ponce de Leon

Session Chairs: Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Jow-Lay Huang, National Cheng Kung University

**8:00 AM****(ICACC-PACRIM-009-2011) R&D Activities on Engineering Ceramics in AIST (Invited)**

T. Ohji\*, H. Kita, Y. Yoshizawa, K. Hirao, National Institute of Advanced Industrial Science and Technology, Japan

**8:30 AM****(ICACC-PACRIM-010-2011) Nano-Coating for High-Efficiency Energy Use and Rare-Metal Substitution (Invited)**

T. Goto\*, IMR Tohoku University, Japan

**9:00 AM****(ICACC-PACRIM-011-2011) Introduction of KICET (Korea Institute of Ceramic Engineering & Technology) (Invited)**

K. Kim\*, KICET, Republic of Korea

**9:30 AM****Break****9:50 AM****(ICACC-PACRIM-012-2011) Status of Ceramic Components in Korean Semiconductor Industry (Invited)**

S. Lee, KICET, Republic of Korea; D. Kim\*, KAIST, Republic of Korea

**10:20 AM****(ICACC-PACRIM-013-2011) Overview of ceramics in energy and related industry in Korea (Invited)**

S. Woo\*, I. Han, S. Kim, Korea Institute of Energy Research, Republic of Korea

**10:50 AM****(ICACC-PACRIM-014-2011) Seeds Innovation and Applications Development of Silicon Nitride Ceramics (Invited)**

K. Komeya\*, J. Tatami, Yokohama National University, Japan

**11:20 AM****(ICACC-PACRIM-015-2011) Development of Supercritical-Property-Ceramics through Interface Engineering (Invited)**

H. Kim\*, Korea Institute of Materials Science, Republic of Korea

**11:50 AM****(ICACC-PACRIM-016-2011) Dye-sensitized Solar Cells Based on Nanocrystalline TiO<sub>2</sub> – Recent Progress in Taiwan (Invited)**

J. Ting\*, National Cheng Kung University, Taiwan

**S1: Mechanical Behavior and Performance of Ceramics & Composites****Mechanical Behavior of Ceramics and Composites**

Room: Coquina Salon A

Session Chairs: Jacques Lamon, CNRS; Dietmar Koch, Univ. of Bremen

**1:30 PM****(ICACC-S1-023-2011) Measurement of the Elastic Modulus of CMCs in All Directions (Invited)**

G. Morscher\*, The University of Akron, USA; M. Singh, Ohio Aerospace Institute, USA

**2:00 PM****(ICACC-S1-024-2011) Influence of pre-loading on the interlaminar properties of Ceramics Matrix Composites**

D. Koch\*, T. Krause, K. Rezwan, G. Grathwohl, Univ. of Bremen, Germany

**2:20 PM****(ICACC-S1-025-2011) Mechanical properties of two different carbon-carbon composites before and after heat treatment**

S. Iqbal\*, Southern Illinois Univ, Carbondale, USA

**2:40 PM****(ICACC-S1-026-2011) Creep Behaviour of BSCF Oxygen Transport Membranes**

R. W. Steinbrech\*, B. Rutkowski, J. Malzbender, B. Huang, Forschungszentrum Jülich GmbH, Germany; R. Kriegel, Fraunhofer IKTS, Institutsteil Hermsdorf, Germany; T. Beck, Forschungszentrum Jülich GmbH, Germany

**3:00 PM****Break****3:20 PM****(ICACC-S1-027-2011) Microstructure and creep behavior of intergranular alumina/SiC nanocomposites sintered by SPS**

M. Jaafar\*, G. Bonnefont, G. Fantozzi, H. Reveron, Insa Lyon, France

**3:40 PM****(ICACC-S1-028-2011) Thermal Shock Resistance of Yttria-Stabilized Zirconia with a Second Phase**

J. P. Angle\*, M. Mecartney, UC Irvine, USA

**4:00 PM****(ICACC-S1-029-2011) Effects of Loading on Foreign Object Damage in Ceramic Matrix Composites**

D. C. Faucett\*, S. R. Choi, NAVAIR, USA

**4:20 PM****(ICACC-S1-030-2011) Fatigue behavior, bridging stresses, and fatigue reliability in Si<sub>3</sub>N<sub>4</sub> ceramics**

R. B. Greene\*, J. J. Kruzic, Oregon State University, USA; S. Fünfschilling, T. Fett, Karlsruhe Institute of Technology, Germany

**4:40 PM****(ICACC-S1-031-2011) Mechanical property characterization of a transparent spinel ceramic**

R. W. Steinbrech, O. Tokariev\*, J. Malzbender, Forschungszentrum Jülich GmbH, Germany; L. Schnetter, CeramTec-ETEC GmbH, Germany

**5:00 PM****(ICACC-S1-032-2011) Mechanical and Thermal Properties of Copper-Alumina Interpenetrating Composites**

J. S. Winzer\*, L. Weiler, V. Salit, D. Gross, J. Rödel, Technische Universität Darmstadt, Germany

## S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications

### Environmental Barrier Coatings for Turbine Engines and Extreme Environments

Room: Coquina Salon G

Session Chairs: Rishi Raj, University of Colorado at Boulder; Joyce Dever, NASA Glenn Research Center

**1:30 PM**

#### (ICACC-S2-022-2011) Progress in Understanding and Mitigating the CMAS Attack of High Temperature Ceramic Coatings (Invited)

K. M. Grant, E. M. Zaleski, R. Jackson, C. G. Levi\*, University of California, Santa Barbara, USA

**2:00 PM**

#### (ICACC-S2-023-2011) Tailoring Polymer-derived Bond-coats For EBC On Silicon Based Ceramics

C. Lewinsohn\*, H. Anderson, J. Johnston, Ceramtec, Inc., USA; R. Bhatt, D. Zhu, NASA Glenn Research Center, USA

**2:20 PM**

#### (ICACC-S2-024-2011) Low Pressure Plasma Spray Thin Film (LPPS-TF) Deposition of Ceramics for Protective Coatings (Invited)

B. Harder\*, D. Zhu, NASA Glenn Research Center, USA

**2:50 PM**

#### (ICACC-S2-025-2011) Self-healing Matrices for SiC Matrix Ceramic Matrix Composites

D. Poerschke\*, L. Merrill, C. Levi, University of California, Santa Barbara, USA

**3:10 PM**

Break

**3:30 PM**

#### (ICACC-S2-026-2011) Polymer Derived Ceramics and Related Materials for Ultrahigh Temperature Coatings: The Science and the Technology (Invited)

R. Raj\*, K. Terauds, J. Lonergan, University of Colorado at Boulder, USA; D. Marshall, Teledyne Scientific and Imaging Company, USA; B. Rashkova, G. Dehm, Austrian Academy of Sciences, Austria

**4:00 PM**

#### (ICACC-S2-027-2011) Ultrahigh Temperature SiCN-HfO<sub>2</sub> Environmental Barrier Composite Coatings on SiC up to 1600°C

K. Terauds\*, R. Raj, University of Colorado, USA

**4:20 PM**

#### (ICACC-S2-028-2011) Creep and Fatigue Behavior of Hafnia and Ytterbium Silicate Environmental Barrier Coating Systems on SiC/SiC Ceramic Matrix Composites

D. Zhu\*, D. Fox, L. Ghosn, B. Harder, NASA Glenn Research Center, USA

**4:40 PM**

#### (ICACC-S2-029-2011) Oxidation Reactions and Kinetics of SiC, Si-C-N & HfO<sub>2</sub> Ceramic Composites at Ultra High Temperatures

J. M. Lonergan\*, R. Raj, University of Colorado, USA

**5:00 PM**

#### (ICACC-S2-030-2011) An Yb<sub>2</sub>Si<sub>2</sub>O<sub>7</sub> oxidation resistance coating for C/C composites by supersonic plasma spray

G. Lingjun\*, Northwestern Polytechnical University, China; H. Minna, L. Hejun, L. Kezhi, Northwestern Polytechnical University, China

**5:20 PM**

#### (ICACC-S2-031-2011) Si-Mo-B oxidation resistance coating for SiC-coated carbon/carbon composites

Y. Zhang\*, H. Li, K. Li, Q. Fu, Northwestern Polytechnical University, China

## S3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

### Reliability/Degradation

Room: Coquina Salon E

Session Chairs: Shailesh Vora, US Department of Energy; Yeong-Shyung Chou, Pacific Northwest National Laboratory

**1:30 PM**

#### (ICACC-S3-020-2011) Microstructural Change in Electrodes During Discharge Operation of Solid Oxide Fuel Cells (Invited)

T. Matsui\*, H. Muroyama, K. Eguchi, Kyoto University, Japan

**2:00 PM**

#### (ICACC-S3-021-2011) Residual stress measurement on electrolyte of segmented-in series SOFC using X-ray stress measuring method

T. Somekawa\*, K. Fujita, H. Yakabe, Y. Matsuzaki, Tokyo Gas Co., Ltd., Japan

**2:20 PM**

#### (ICACC-S3-022-2011) Redox-Induced Performance Degradation of Anode-Supported Tubular SOFCs

Y. Heo, Korea Advanced Institute of Science and Technology, Republic of Korea; J. Lee, S. Lee, T. Lim, S. Park, R. Song\*, D. Shin, Korea Institute of Energy Research, Republic of Korea

**2:40 PM**

#### (ICACC-S3-023-2011) Numerical Modeling of Contact Material Densification

B. J. Koepfel\*, W. N. Liu, E. V. Stephens, M. A. Khaleel, Pacific Northwest National Laboratory, USA

**3:00 PM**

Break

### Sealant Glasses

Room: Coquina Salon E

Session Chairs: Shailesh Vora, US Department of Energy; Yeong-Shyung Chou, Pacific Northwest National Laboratory

**3:20 PM**

#### (ICACC-S3-024-2011) Performance of Glass-ceramic Sealant in Planar SOFC Short Stack Assemblies

F. Smeacetto\*, M. Salvo, M. Santarelli, P. Leone, Politecnico di Torino, Italy; T. Moskalewicz, AGH University of Science and Technology, Poland; A. Chrysanthou, University of Hertfordshire, United Kingdom; M. Ferraris, Politecnico di Torino, Italy

**3:40 PM**

#### (ICACC-S3-025-2011) Compliant sealing glass for SOFC applications: thermal cycle stability and chemical compatibility with YSZ coating

Y. Chou\*, E. T. Thomsen, R. T. Williams, J. P. Choi, N. L. Canfield, J. F. Bonnett, J. W. Stevenson, Pacific Northwest National Laboratory, USA

**4:00 PM**

#### (ICACC-S3-026-2011) Interactions of Viscous Sealants with Solid Oxide Fuel Cell Components

M. O. Naylor\*, J. E. Shelby, S. T. Mixture, Kazuo Inamori School of Engineering, Alfred University, USA

**4:20 PM**

#### (ICACC-S3-027-2011) Effect of environmental exposure on the microstructural stability of a barium silicate glass seal

A. Shyam\*, R. Trejo, D. McClurg, J. Muth, M. Kirkham, E. Lara-Curzio, Oak Ridge National Laboratory, USA

**4:40 PM**

#### (ICACC-S3-028-2011) High-Temperature Viscous Sealing Glasses for Solid Oxide Fuel Cells

C. Kim\*, C. L. Schwartz, J. Szabo, K. Barr, T. E. Day, MO-SCI Corporation, USA; R. K. Brow, Z. Tang, Missouri University of Science and Technology, USA

**5:00 PM**

**(ICACC-S3-029-2011) Effect of MgO addition on crystalline phase formation and thermal expansion of a barium aluminosilicate solid oxide fuel cell glass-ceramic sealant**

N. Dasgupta\*, B. Butler, E. Sorge, Materials & Systems Research, Inc., USA

**S4: Armor Ceramics****Microstructural Design for Enhanced Armor Ceramics**

Room: Coquina Salon D

Session Chair: Andrew Wereszczak, Oak Ridge National Laboratory

**1:30 PM**

**(ICACC-S4-022-2011) Nature-Inspired Ultrahigh Toughness Ceramic-Polymer Structural Composites (Invited)**

R. O. Ritchie\*, University of California, Berkeley, USA; A. P. Tomsia, Lawrence Berkeley National Laboratory, USA

**2:00 PM**

**(ICACC-S4-023-2011) Material design for superplasticity in covalent ceramics: Grain refinement and grain-boundary controlling (Invited)**

Y. Shinoda\*, Tokyo Institute of Technology, Japan

**2:30 PM**

**(ICACC-S4-024-2011) Influence of Variations in the Starting Powders Chemistry and Crystallinity on Physical and Mechanical Properties of SPS SiC**

V. Domnich\*, R. A. Haber, Rutgers University, USA

**2:50 PM**

**Break**

**3:10 PM**

**(ICACC-S4-025-2011) Tensile Failure Stress Anisotropy in Hot-Pressed Silicon Carbide**

D. J. Vuono\*, A. A. Wereszczak, P. J. Ritt, Oak Ridge National Laboratory, USA; J. Campbell, US Army Research Laboratory, Aberdeen Proving Ground, USA

**3:30 PM**

**(ICACC-S4-026-2011) Fabrication of High Volume Fraction SiC<sub>p</sub> / Al Metal Matrix Composites**

R. McCuiston\*, King Mongkut's University of Technology Thonburi, Thailand; S. Ngenbamrung, K. Dateraksa, K. Sujrote, National Metal and Materials Technology Center, Thailand; J. Wannasin, T. Sungkapun, Prince of Songkla University, Thailand

**3:50 PM**

**(ICACC-S4-027-2011) Microstructural Design for Si-B4C-Diamond System**

P. Karandikar\*, S. Wong, G. Evans, M. Aghajanian, M Cubed Technologies, Inc., USA

**4:10 PM**

**(ICACC-S4-028-2011) Mechanical Properties and Deformation Mechanisms of B<sub>4</sub>C-TiB<sub>2</sub> Eutectic Composites**

R. M. White\*, E. C. Dickey, The Pennsylvania State University, USA

**4:30 PM**

**(ICACC-S4-029-2011) Mechanical Properties of Superhard Boride-Carbide Particulate Composites**

E. W. Neuman\*, W. Faherentholtz, G. Hilmas, Missouri University of Science and Technology, USA

**4:50 PM**

**(ICACC-S4-030-2011) Structural Variations in Boron Carbide as a Function of Carbon Content: Raman Spectroscopy and X-Ray Diffraction Studies**

V. Domnich\*, D. W. Maiorano, R. A. Haber, Rutgers University, USA

**S5: Next Generation Bioceramics****Advanced Processing of Bioceramics**

Room: Ponce de Leon

Session Chairs: Roger Narayan, University of North Carolina; Akiyoshi Osaka, Okayama University

**1:00 PM**

**(ICACC-S5-001-2011) Electrically Active Bioceramics (Invited)**

I. Turner\*, University of Bath, United Kingdom

**1:30 PM**

**(ICACC-S5-002-2011) Formation of Porous Zirconia and Titania with Self-assembling Agarose Templatation (Invited)**

X. Ma, M. Akinc\*, Iowa State University, USA

**2:00 PM**

**(ICACC-S5-003-2011) Preparation of silica-based composite particles for blood purification therapy (Invited)**

J. Li, Y. Shirotsaki, S. Hayakawa, A. Osaka\*, Okayama University, Japan

**2:30 PM**

**(ICACC-S5-005-2011) Laser based additive processing of bioceramics (Invited)**

S. Hoeges\*, W. Meiners, Fraunhofer Institute for Laser Technology, Germany

**2:50 PM**

**Break**

**3:10 PM**

**(ICACC-S5-006-2011) Antibacterial, Abrasion-Resistant Micropatterned Alumina Surfaces**

L. Treccani\*, K. Rezwan, University of Bremen, Germany

**3:30 PM**

**(ICACC-S5-007-2011) Two photon polymerization for fabrication of small-scale medical devices out of organically-modified ceramic materials**

R. Narayan\*, A. Doraiswamy, S. Gittard, N. Monteiro-Riviere, University of North Carolina, USA; A. Ovsianikov, B. Chichkov, Laser Zentrum Hannover, Germany

**3:50 PM**

**(ICACC-S5-008-2011) Effects of Electrical Modification on Phase Stability of Y-TZP Ceramics (Invited)**

Y. Tanaka\*, H. Hara, N. Enomoto, Kyushu University, Japan; K. Yamashita, Tokyo Medical and Dental University, Japan; J. Hojo, Kyushu University, Japan

**4:10 PM**

**(ICACC-S5-009-2011) Synthesis and Characterization of Multi ion doped hydroxylapatite**

A. Bahadir, C. Ergun\*, G. Gunes, Istanbul Technical University, Turkey; T. J. Webster, Brown University, USA; I. Erden, Yildiz Technical University, Turkey

**4:30 PM**

**(ICACC-S5-010-2011) Fabrication of hydroxyapatite-calcite Nanocomposite**

E. Girija\*, G. Suresh Kumar, Periyar University, India; A. Thamizhavel, Tata Institute of Fundamental Research, India; Y. Yokogawa, Osaka City University, Japan; S. Narayana Kalkura, Anna University, India

**4:50 PM**

**(ICACC-S5-011-2011) Functionalisation of calcium phosphate powders for protein delivery**

V. Ozhukil Kollath\*, H. Omari, R. Persoons, J. Luyten, S. Mullens, VITO, Belgium; R. Cloots, University of Liege, Belgium; C. Vervaeke, B. De Geest, J. Remon, Ghent University, Belgium

**5:10 PM**

**(ICACC-S5-012-2011) Collagen-templated sol-gel preparation of ultra-fine silica nanotube films and osteoblastic cell proliferation**

S. Chen\*, National Institute for Materials Science, Japan; T. Ikoma, Tokyo Institute of Technology, Japan; J. Li, H. Morita, National Institute for Materials Science, Japan; A. Osaka, Okayama University, Japan; M. Takeguchi, National Institute for Materials Science, Japan; N. Hanagataa, Hokkaido University, Japan

## S7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications

### Polymer Nanocomposite Technology and Nanoporous Materials

Room: Coquina Salon C

Session Chairs: Alan Weimer, University of Colorado; Christopher DiAntonio, Sandia National Laboratories

**1:30 PM**

**(ICACC-S7-011-2011) Functionalization of Ultra-fine Particles with Nano-thick Controlled Films (invited) (Invited)**

A. W. Weimer\*, University of Colorado, USA

**2:00 PM**

**(ICACC-S7-012-2011) Novel Synthesis of Silicates from Silicone Resins filled with Oxide Nano-particles**

E. Bernardo\*, G. Parcianello, P. Colombo, University of Padova, Italy

**2:20 PM**

**(ICACC-S7-013-2011) Synthesis and Characterization of Nano-particle Barium Titanate Based Nanocomposites**

C. DiAntonio\*, T. Monson, M. Winter, A. Roesler, P. Yang, T. Chavez, Sandia National Laboratories, USA

**2:40 PM**

**(ICACC-S7-014-2011) Controlled amine functionalization of multi walled carbon nanotubes for the fabrication of PLA-CNT composites**

S. Kesavan Pillai\*, J. Ramontja, S. Sinha Ray, Council for Scientific and Industrial Research (CSIR), South Africa

**3:00 PM**

**Break**

**3:20 PM**

**(ICACC-S7-065-2011) Mechanism of Enhanced Tenacity in Polymer Nanocomposite Studied by Small-angle X-ray Scattering and Electron Microscopy**

J. Bandyopadhyay\*, S. Sinha Ray, Council for Scientific and Industrial Research, South Africa

**3:40 PM**

**(ICACC-S7-016-2011) Macro-scale and Highly Porous Conducting Polymer Composites for Efficient Oxygen Reduction**

R. Parajuli, H. He\*, Rutgers University, USA

**4:00 PM**

**(ICACC-S7-017-2011) Highly Porous SiCO NanoCeramics from Organically-bridged Alkoxysilanes**

A. Parakkulam Ramaswamy, G. D. Soraru\*, University of Trento, Italy

**4:20 PM**

**(ICACC-S7-018-2011) Boron Carbide-Nanowires/Carbon-Microfiber Hybrid Structures and Composites from Cotton T-shirts**

X. Tao, University of South Carolina, USA; L. Dong, ETH Zurich, Switzerland; X. Wang, University of South Carolina, USA; W. Zhang, Zhejiang University of Technology, China; B. J. Nelson, ETH Zurich, Switzerland; X. Li\*, University of South Carolina, USA

**4:40 PM**

**(ICACC-S7-019-2011) Nanodiamond-Polyaniline Nanocomposite: The Chemio-Physico Investigation and Application of New Frontier Films**

H. Gomez\*, M. K. Ram, A. Kumar, University of South Florida, USA

**5:00 PM**

**(ICACC-S7-020-2011) Unusual Crystallization Behavior of Biodegradable Polylactide in Presence of Functionalized Carbon Nanotubes**

J. Ramontja\*, S. Pillai, S. Sinha Ray, Council for Scientific and Industrial Research, South Africa; A. S. Luyt, University of Free State, Quaqqua Campus, South Africa

## S8: 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT) in honor of Professor Katsutoshi Komeya

### Novel Forming and Sintering II

Room: Coquina Salon B

Session Chairs: Morgana Fall, Ceralink Inc; Do Kyung Kim, KAIST

**1:40 PM**

**(ICACC-S8-023-2011) Rapid limestone calcination using Microwave Assist Technology**

M. Fall\*, S. M. Allan, H. S. Shulman, Ceralink Inc, USA

**2:00 PM**

**(ICACC-S8-024-2011) Pressureless microwave sintering of aluminum nitride**

H. S. Shulman\*, S. Allan, N. Vandervoort, M. L. Fall, M. Elmer, Ceralink Inc., USA

**2:20 PM**

**(ICACC-S8-025-2011) Microwave Processing of Nanostructured Multilayer Ceramic Capacitors**

B. Vaidhyananathan\*, A. Ketharam, V. Venkatachalam, J. Binner, Loughborough University, United Kingdom

**2:40 PM**

**(ICACC-S8-026-2011) Microwave sintering of AlN ceramics with TiC/Al<sub>2</sub>O<sub>3</sub> as susceptor material**

Z. Zhang\*, Shanghai Institute of Ceramics, CAS, China

**3:00 PM**

**Break**

**3:20 PM**

**(ICACC-S8-027-2011) A Comparative Study on Microwave and Conventional Sintering Characteristics of Alumina and Alumina Matrix Nanocomposites**

B. Kayiplar\*, A. F. Dericioglu, Middle East Technical University, Turkey

**3:40 PM**

**(ICACC-S8-028-2011) Shock Compaction and Characterization of Nanocrystalline Materials via Planar Shock Wave**

H. Kim, KAIST, Republic of Korea; S. Chang, ADD, Republic of Korea; D. Kim\*, KAIST, Republic of Korea

**4:00 PM**

**(ICACC-S8-029-2011) Large, Near Net-Shaped Components by Field Assisted Sintering**

C. Haines\*, US Army ARDEC, USA; J. Singh, Penn State University, USA; D. Martin, US Army ARDEC, USA; B. DeForce, Penn State University, USA; D. Kapoor, US Army ARDEC, USA

**4:20 PM**

**(ICACC-S8-030-2011) Sintering and Forming Ceramics with Large Dimensions Using SPS**

D. Jiang\*, A. K. Mukherjee, University of California, USA

**4:40 PM**

**(ICACC-S8-031-2011) Influence of the pulse pattern on the spark plasma sintering of Si<sub>3</sub>N<sub>4</sub> ceramics**

M. Belmonte\*, P. Miranzo, I. Osendi, Institute of Ceramics and Glass (CSIC), Spain

**5:00 PM**

**(ICACC-S8-032-2011) Densification Mechanisms of Ytria-Stabilized Zirconia Based Amorphous Powders by Electric Current Assisted Sintering Process**

T. Kumagai\*, K. Hongo, National Defense Academy, Japan

## S9: Porous Ceramics: Novel Developments and Applications

### Structure and Properties of Porous Ceramics III

Room: Coquina Salon H

Session Chair: Thomas Watkins, ORNL

**1:30 PM**

#### (ICACC-S9-024-2011) Elastic Property Comparison of Porous Cellular Ceramics Using Multiple Test Methods (Invited)

R. Stafford\*, Cummins Inc, USA; T. Watkins, A. Shyam, Oak Ridge National Laboratory, USA; P. Gloeckner, Cummins Inc, USA

**2:00 PM**

#### (ICACC-S9-025-2011) Properties and Thermal Shock Resistance of Fine Porous Alumina for Support Substrates of Ceramic Membranes

S. Honda\*, S. Takaaki, N. Nishihara, S. Hashimoto, Nagoya Institute of Technology, Japan; T. Eda, H. Watanabe, K. Miyajima, Noritake Co., Limited, Japan; Y. Iwamoto, Nagoya Institute of Technology, Japan

**2:20 PM**

#### (ICACC-S9-026-2011) Functionalized Fly Ash: A Recyclable Sorbent for Oil Spill Clean-up and Energy Recovery

D. Reid\*, B. Ellis, L. Hench, S. Seal, University of Central Florida, USA

**2:40 PM**

#### (ICACC-S9-027-2011) Microstructural Study on Alumina Porous Ceramic Produced by Reaction Bonding of Aluminium Powder Mixed with Corn Starch

J. Anggono\*, I. S. Shavutri, Petra Christian University, Indonesia

**3:00 PM**

Break

## Applications of Porous Ceramics

Room: Coquina Salon H

Session Chair: Thomas Watkins, ORNL

**3:20 PM**

#### (ICACC-S9-028-2011) Materials Science and Materials Chemistry for Large-Scale Electrochemical Energy Storage (Invited)

J. Liu\*, Pacific Northwest National Laboratory, USA

**3:50 PM**

#### (ICACC-S9-029-2011) Use of Porous Ceramics to Enhance Water Cleanup using Nanomaterials

J. Schorr\*, R. Helderich, S. Sengupta, R. Revur, MetaMateria Technologies, USA

**4:10 PM**

#### (ICACC-S9-030-2011) High Porosity In Situ Catalyzed Carbon Honeycombs for Mercury Capture in Coal Fired Power Plants (Invited)

M. Ruffin\*, M. Owusu, B. Y. Johnson, Corning, Incorporated, USA

**4:40 PM**

#### (ICACC-S9-031-2011) Zirconia based ceramic honeycombs for the production of synthetic fuels by two-step thermochemical decomposition of CO<sub>2</sub> and H<sub>2</sub>O at elevated temperatures

L. S. Walker\*, University of Arizona, USA; J. E. Miller, N. P. Siegel, Sandia National Laboratories, USA; G. E. Hilmas, Missouri University of Science and Technology, USA; E. L. Corral, University of Arizona, USA

**5:00 PM**

#### (ICACC-S9-032-2011) Repair Segmental Bone Defects with Modified Tissue Engineering Method in Rabbit Radius

C. Lijia\*, Key Laboratory of Transplant Engineering and Immunology, Ministry of Health, West China Hospital, Sichuan University, China

## S13: Advanced Ceramics and Composites for Nuclear Fusion Applications

### Joining and Integration of Ceramic Structures

Room: Oceanview

Session Chair: Cristian Contescu

**1:30 PM**

#### (ICACC-S13-011-2011) Processing and characterization of SiC/SiC pin cladding for GFR

C. Sauder\*, C. Lorrette, CEA, France; B. Humez, E. Rohmer, Laboratoire des Composites thermosturcturaux, France

**1:50 PM**

#### (ICACC-S13-012-2011) Joining of NITE SiC/SiC Composite and Metals for Nuclear Applications

H. Kishimoto\*, T. Abe, T. Ono, Muroran Institute of Technology, Japan; T. Shibayama, Hokkaido University, Japan; Y. Kohno, A. Kohyama, Muroran Institute of Technology, Japan

**2:10 PM**

#### (ICACC-S13-013-2011) Joining of SiC/SiC for nuclear applications

M. Ferraris\*, V. Casalegno, S. Han, S. Rizzo, M. Salvo, A. Ventrella, Politecnico di Torino, Italy

**2:30 PM**

#### (ICACC-S13-014-2011) Assembly Technique for SiC/SiC Composite Compact Intermediate Heat Exchanger Utilizing SiC Slurry Sheet

T. Hinoki\*, Y. Park, S. Konishi, Kyoto University, Japan

**2:50 PM**

#### (ICACC-S13-015-2011) Joining of Thin SiC/SiC Composites by Local Heating

J. Elodie\*, L. Maillé, Y. Le Petitcorps, E. Martin, LCTS, France; C. Lorrette, C. Sauder, CEA, France

**3:10 PM**

Break

## Crystalline, Amorphous and Composite Materials for Waste Immobilization

Room: Oceanview

Session Chair: Kevin Fox, Savannah River National Lab

**3:30 PM**

#### (ICACC-S13-016-2011) Technology Development to Reduce Mission Life and Glass Volumes for US High Level Waste Vitrification Facilities (Invited)

D. Peeler\*, SRNL, USA

**4:00 PM**

#### (ICACC-S13-017-2011) Layered Double Hydroxides for Anion Capture and Storage

J. Phillips\*, L. J. Vandeperre, Imperial College London, United Kingdom

**4:20 PM**

#### (ICACC-S13-018-2011) Functionalized Silica Aerogels: Advanced Materials to Capture and Immobilize Radioactive Iodine

J. Matyas\*, G. E. Fryxell, K. Wallace, B. J. Busche, L. S. Fifield, PNNL, USA

**4:40 PM**

#### (ICACC-S13-019-2011) Bottom-up design of a cement for nuclear waste encapsulation

L. J. Vandeperre, T. Zhang\*, C. Cheeseman, Imperial College London, United Kingdom

**5:00 PM**

#### (ICACC-S13-020-2011) Irradiation Damage Effects in Glass Ceramics for Advanced Waste Form Development

M. Tang\*, A. Kossov-Simakov, M. Zhou, J. Valdez, G. Jarvinen, K. Sickafus, Los Alamos National Laboratory, USA; J. Crum, L. Turo, Pacific Northwest National Laboratory, USA; K. Fox, A. Billings, K. Brinkman, J. Marra, Savannah River National Laboratory, USA

## S14: Advanced Materials and Technologies for Rechargeable Batteries

### Materials Design, Screening, and Electrode Architectures for Lithium-ion Batteries

Room: Coquina Salon F

Session Chairs: Veronica Barone, Central Michigan University; Mike Badding, Corning Incorporated

**1:30 PM**

#### (ICACC-S14-018-2011) Design of (thio)phosphates for high performance lithium ion batteries (Invited)

S. Adams\*, R. Prasada Rao, National University of Singapore, Singapore

**2:00 PM**

#### (ICACC-S14-019-2011) Finding Room for Improvement in Transition Metal Oxides Cathodes for Lithium-ion Batteries

K. C. Kam\*, M. M. Doeff, Lawrence Berkeley National Laboratory, USA

**2:20 PM**

#### (ICACC-S14-020-2011) Lithium batteries for EV: the challenges faced by electrolytes

J. Sanchez\*, F. Alloin, C. Iojoiu, L. Cointeaux, J. Leprêtre, Grenoble INP, France; F. Toulgoat, UCBL, France; E. Paillard, Grenoble INP, France; R. Arvai, B. Langlois, UCBL, France; P. Judeinstein, Orsay, France; N. El Kissi, Grenoble INP, France

**2:40 PM**

#### (ICACC-S14-021-2011) Autogenic Reactions for the Fabrication of Lithium Battery Electrode Materials

V. Pol\*, M. Thackeray, Argonne National Lab, USA

**3:00 PM**

Break

**3:20 PM**

#### (ICACC-S14-022-2011) Lithium ion Conductive Solid Electrolyte with Porous / Dense Bi-layer Structure for All Solid State Battery (Invited)

K. Kanamura\*, Tokyo Metropolitan University, Japan

**3:50 PM**

#### (ICACC-S14-023-2011) Multi-Scale Description of the Electronic Transport in a Composite Electrode for Lithium Battery

J. Badot\*, CNRS - Chimie ParisTech, France; K. Seid, CNRS, France; O. Dubrunfaut, CNRS - UPMC - Paris Sud, France; S. Levasseur, UMICORE, Belgium; D. Guyonard, B. Lestriez, CNRS, France

**4:10 PM**

#### (ICACC-S14-024-2011) Lithium Accumulator - Fully Inorganic Prototype Based on Three-Dimensional Electrodes

J. Prochazka\*, L. Kavan, M. Zukalova, M. Bousa, B. Laskova, JHI, Czech Republic; J. Postler, HE3DA, s.r.o., Czech Republic; K. Neufuss, IPP, Czech Republic

**4:30 PM**

#### (ICACC-S14-025-2011) Optimization of PVDF content and molecular weight for LiNi1/3Mn1/3Co1/3O2 composite cathodes

J. Li\*, B. Armstrong, J. Higgins, C. Daniel, D. Wood, Oak Ridge National Laboratory, USA

**4:50 PM**

#### (ICACC-S14-026-2011) In-situ stress determination in LiCoO2 and LiCoO2 - MWCNT during electrochemical cycling

A. Mukhopadhyay\*, J. Lahache, A. Tokranov, B. Sheldon, Brown University, USA

## Poster Session A

Room: Ocean Center

**5:30 PM**

#### (ICACC-PACRIM-P001-2011) Control of Microstructure and Thermal Conductivity of Large-sized, Hot-pressed AlN

S. M. Na, S. I. Kim, S. I. Ko, YJC Co., Ltd., Democratic People's Republic of Korea; S. J. Lee\*, Mokpo National University, Democratic People's Republic of Korea

#### (ICACC-PACRIM-P002-2011) SiOC Fiber of Fine Diameter Prepared by New Curing Process

D. G. Shin\*, K. Y. Cho, Korea Institute of Ceramic Engineering and Technology, Republic of Korea; J. S. Hong, H. R. Lim, Y. R. Cho, M. S. Kang, D. H. Riu, Seoul National University of Technology, Republic of Korea

#### (ICACC-S1-P004-2011) Stress effect on the microstructure and vibrational properties of LaCoO3 based perovskites

Y. Chen, J. Dinan\*, N. Orlovskaya, University of Central Florida, USA

#### (ICACC-S1-P005-2011) Processing of Continuous Al2O3 Nano-fibers

Y. Kagawa\*, T. Saito, K. Matumura, R. T. Doloksaribu, The University of Tokyo, Japan; H. Kakisawa, Y. Tanaka, National Institute for Materials Science, Japan

#### (ICACC-S1-P006-2011) X-Ray Transmission Characteristics of B4C Sintered Samples for High Hardness Windows Applications

C. A. Costa\*, UFRJ, Brazil; V. M. Domingues, UFRJ, Brazil; A. F. Barbosa, CBPF, Brazil; J. B. de Campos, UERJ, Brazil; P. S. Cosentino, Army Evaluation Center, Brazil

#### (ICACC-S1-P007-2011) In situ, high temperature, synchrotron studies of monoclinic to tetragonal phase transformation in HfO2 and Ta2O5 - doped HfO2 system

R. P. Haggerty\*, P. Sarin, Z. D. Apostolov, Z. Jones, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

#### (ICACC-S1-P008-2011) CTEAS - Program to Determine Thermal Expansion Properties of Materials from High Temperature X-ray Diffraction

R. Haggerty\*, P. Sarin, Z. A. Jones, W. M. Kriven, University of Illinois Urbana-Champaign, USA

#### (ICACC-S1-P009-2011) How Do You Measure That Ceramic Property?

J. Salem, NASA GRC, USA; J. Helfinstine\*, Retired, USA; G. Quinn, NIST, USA; S. Gonczy, Gateway Materials Technology, Inc., USA

#### (ICACC-S1-P010-2011) Synthesis and characterization of Ta-doped lead free Bi0.5(Na0.5K0.5)0.5TiO3 piezoelectric ceramics

K. Kumar\*, B. Kumar, crystal lab, India

#### (ICACC-S1-P011-2011) Local Damage Detection in SiC/SiC Composites by Thermal Imaging Technique

S. Sadohara\*, Y. Kagawa, The University of Tokyo, Japan

#### (ICACC-S1-P012-2011) Damage Characterization in SiC/SiC Composites using Electrical Resistance

C. Smith\*, Ohio Aerospace Institute, USA

#### (ICACC-S1-P013-2011) Synthesis of Ceramic Materials and Compositions with Soft Mechano-Chemical Assistance

R. Yu\*, The Chinese Ceramic Society, China

#### (ICACC-S1-P014-2011) Glass Composites Containing Carbon Nanotubes: Processing, Characterisation and Prospects for Toughening

T. Subhani\*, J. Cho, Imperial College London, United Kingdom; F. Inam, M. J. Reece, Queen Mary University of London, United Kingdom; W. E. Lee, Imperial College London, United Kingdom; A. R. Boccaccini, University of Erlangen-Nuremberg, Germany; M. S. Shaffer, Imperial College London, United Kingdom

#### (ICACC-S1-P015-2011) FEM and Experimental Studies on the Optimization of Fiber Volume Ratio in SiC Fiber Reinforced SiC Ceramics under Hertzian Stress

T. Kim\*, J. Park, I. Kim, K. Lee, Kook-Min University, Republic of Korea

#### (ICACC-S1-P016-2011) Evaluation of mechanical property in polycrystalline translucent ceramics

Y. Ogihara\*, S. Honda, Y. Iwamoto, Nagoya Institute of Technology, Japan; A. Ikesue, Y. L. Aung, World Lab, Japan

#### (ICACC-S1-P017-2011) Effect of Reactive Heat Treatment on Properties of Al-Mg-B4C Composites

M. K. Aghajanian\*, A. L. McCormick, M. Waggoner, M Cubed Technologies, USA

#### (ICACC-S1-P018-2011) Pressureless Sintering of Boron Carbide Using Amorphous Boron and SiC As Additives

C. A. Costa\*, V. M. Domingues, UFRJ, Brazil; J. B. de Campos, UERJ, Brazil; P. S. Cosentino, Army Evaluation Center, Brazil

#### (ICACC-S1-P019-2011) Optical and Mechanical Properties of Rare Earth Oxides Doped Polycrystalline Silicon Nitride Ceramics

B. Joshi\*, S. W. Lee, Sun Moon University, Republic of Korea

**(ICACC-S1-P020-2011) Determination of Apparent Porosity Level of Refractory Concrete Using Ultrasonic Pulse Velocity Technique and Image Analysis**

A. M. Terzic\*, L. M. Pavlovic, Institute for Technologz of Nuclear and Other Raw Mineral Materials, Serbia; V. V. Mitic, Faculty of Electronic Engineering, Serbia

**(ICACC-S1-P021-2011) Effect of Reaction Time on Composition and Properties of SiC-Diamond Ceramic Composites**

S. Salamone\*, O. Spriggs, M Cubed Technologies Inc., USA

**(ICACC-S1-P022-2011) Mechanical and Microstructure Characterization of Reaction Bonded Silicon Carbide Processed With Petroleum Coke**

R. P. Silva\*, C. A. Costa, M. F. Costa, Universidade Federal do Rio de Janeiro - UFRJ, Brazil

**(ICACC-S1-P023-2011) Frequency and Hold-Time Effects On Durability of Melt-Infiltrated SiC/SiC**

G. Ojard\*, Pratt & Whitney, USA; Y. Gowayed, Auburn University, USA; G. Morscher, Akron University, USA; R. John, Air Force Research Laboratory, USA; U. Santhosh, J. Ahmad, Research Applications, Inc, USA; R. Miller, Pratt & Whitney, USA

**(ICACC-S1-P024-2011) Durability Comparison of Two Ceramic Matrix Composites with a Sequenced Matrix**

G. Ojard\*, Pratt & Whitney, USA; L. Zawada, Air Force Research Laboratory, USA; P. Spriet, SNECMA Propulsion Solide, France; E. Prevost, Pratt & Whitney, USA; E. Bouillon, SNECMA Propulsion Solide, France

**(ICACC-S1-P025-2011) Study of Cohesive Strength of Powders by Means of Rheology**

N. Ku\*, Rutgers University, USA; C. Rohn, Malvern Instruments, USA; R. A. Haber, Rutgers University, USA

**(ICACC-S1-P026-2011) Property and Microstructural Correlations to Wear on Reaction Bonded Materials**

A. Marshall\*, S. Salamone, M Cubed Technologies, Inc., USA

**(ICACC-S1-P075-2011) High Temperature Strength and Corrosion Resistance of Joints Used in Silicon Carbide Heat Exchangers**

J. Fellows, M. A. Wilson, C. A. Lewinsohn, H. Anderson\*, Ceramatec, Inc., USA

**(ICACC-S4-P027-2011) Ultrasonic Nondestructive Characterization of Oil-Based Clay**

V. DeLucca\*, R. A. Haber, Rutgers University, USA

**(ICACC-S4-P028-2011) Microstructure Property-Relationship for Ceramic Armor Materials**

D. M. Slusark\*, R. Haber, Rutgers University, USA

**(ICACC-S4-P029-2011) Examining Characteristics of Silicon Carbide through Various Powder Processing Techniques**

R. Bianchini\*, S. Mercurio, R. Haber, Rutgers University, USA

**(ICACC-S4-P030-2011) Boron carbide sintered with metallic carbides**

P. A. Cosentino, Brazilian Army, Brazil; C. Costa, Federal University of Rio de Janeiro, Brazil; J. Brant\*, State University of Rio de Janeiro, Brazil

**(ICACC-S4-P031-2011) Submicron Boron Carbide Synthesis Through Rapid Carbothermal Reduction**

S. Miller\*, W. Rafaniello, F. Toksoy, D. Maiorano, S. Mercurio, Rutgers University, USA; T. Jessen, Army Research Laboratory, USA; R. A. Haber, Rutgers University, USA

**(ICACC-S4-P032-2011) Development of Nano Alumina and Zirconia Toughened Alumina for Ceramic Armour Applications**

S. Huang\*, J. Binner, B. Vaidyanathan, Loughborough University, United Kingdom; C. Hampson, Morgan Technical Ceramics Ltd, United Kingdom; C. Spacie, Morganite Electrical Carbon Ltd, United Kingdom; P. Brown, Defence Science and Technology Laboratory, United Kingdom

**(ICACC-S4-P033-2011) Attempts to Quantify the Plasticity of Ceramic Materials**

C. Hilton\*, J. McCauley, J. J. Swab, U.S. Army Research Lab, USA

**(ICACC-S4-P034-2011) Strength Testing of Coarse-Grained Transparent Spinel**

J. J. Swab\*, G. Gilde, US Army Research Laboratory, USA; S. Kilczewski, Data Matrix Solutions, USA; R. Pavlacka, Oak Ridge Institute for Science and Education, USA

**(ICACC-S4-P035-2011) Modifying the Cracking Behavior of Silicon Carbide through Advanced Processing and Grain Boundary Engineering**

S. R. Mercurio\*, R. Bianchini, S. Miller, Rutgers University, USA; T. Jessen, U.S. Army Research Laboratory, USA; R. Haber, Rutgers University, USA

**(ICACC-S4-P036-2011) Implications of Ceramic Fracture on the Transition from Dwell to Penetration**

J. C. LaSalvia\*, U.S. Army Research Laboratory, USA

**(ICACC-S4-P037-2011) Impact Failure Mechanism Hierarchies in Armor Ceramics**

B. G. Compton\*, E. A. Gamble, F. W. Zok, UCSB, USA

**(ICACC-S4-P038-2011) Modeling ceramic compressive impact loading with a flaw-driven model**

C. Zingale\*, L. Graham-Brady, K. T. Ramesh, Johns Hopkins University, USA

**(ICACC-S4-P039-2011) Deformation damage in alumina after ballistic impact**

S. Ghosh\*, Loughborough University, United Kingdom; C. J. Dancer, R. I. Todd, University of Oxford, United Kingdom; H. Wu, Loughborough University, United Kingdom

**(ICACC-S4-P040-2011) Intermediate-Rate Fracture Toughness of Ceramic Materials**

D. Casem\*, U.S. Army Research Lab, USA; C. Hilton, Oak Ridge Institute for Science and Education, USA; J. J. Swab, U.S. Army Research Lab, USA

**(ICACC-S4-P041-2011) Effect of Load on Surface and Sub-Surface Features Characteristic of Knoop Indents in Ceramics**

E. R. Shanholtz\*, J. C. LaSalvia, J. J. Swab, U.S. Army Research Laboratory, USA

**(ICACC-S4-P042-2011) Further Observations on Solid-State Amorphization in Sphere-Impacted B4C and  $\beta$ -SiC**

J. LaSalvia, S. Kilczewski\*, U.S. Army Research Laboratory, USA

**(ICACC-S4-P043-2011) Densification and Microstructural Properties of Boron-Carbide in Spark Plasma Sintering**

M. Toksoy\*, R. Haber, Rutgers University, USA

**(ICACC-S4-P044-2011) The Effects of Temperature and Pressure Profiles on the Densification and Microstructural Properties of Transparent Magnesium Aluminate Spinel Fabricated by SPS Processing**

M. Vu\*, R. Haber, Rutgers University, USA

**(ICACC-S4-P045-2011) Boron Carbide Amorphization as a Function of Powder Processing**

D. W. Maiorano\*, V. Domnich, R. A. Haber, Rutgers, The State University of New Jersey, USA

**(ICACC-S4-P046-2011) Theoretical Investigation of Stacking Fault Dynamics in Al, N, O, and B-Doped SiC under External Loading**

V. Domnich\*, R. A. Haber, Rutgers University, USA

**(ICACC-S4-P047-2011) Mesoscale modeling of dynamic failure of polycrystalline armor ceramics**

J. D. Clayton\*, R. H. Kraft, US Army Research Laboratory, USA

**(ICACC-S4-P048-2011) Modeling Heat Transfer during Sublimation Growth of Silicon Carbide Single Crystals by Physical Vapor Transport**

J. B. Allen\*, C. F. Cornwell, N. J. Lee, Engineer Research & Development Center, Information Technology Laboratory, USA; C. P. Marsh, Engineer Research & Development Center, Construction Engineering Research Laboratory, USA; J. F. Peters, Engineer Research & Development Center, Geotechnical & Structures Laboratory, USA; C. R. Welch, Engineer Research & Development Center, Information Technology Laboratory, USA

**(ICACC-S4-P049-2011) Simulation of the Ballistic Impact of Tungsten-Based Penetrators on Confined Hot-Pressed Boron Carbide Targets**

C. G. Fountzoulas\*, J. C. LaSalvia, U.S. Army Research Laboratory, USA

**(ICACC-S4-P050-2011) Multi-Scale Computational Investigations of SiC/B<sub>4</sub>C Interfaces**

C. P. Morrow\*, V. Domnich, R. A. Haber, Rutgers University, USA

**(ICACC-S4-P051-2011) Static and Dynamic Indentation Response of Basal (c) Plane and Pyramidal (a) Plane Sapphire**

E. J. Haney\*, G. Subhash, University of Florida, USA

**(ICACC-S4-P052-2011) Dynamic indentation response of Chemically Strengthened Ion-Armor™ Glass**

G. Subhash\*, P. Jannotti, University of Florida, USA

**(ICACC-S5-P053-2011) Co-substitution in Hydroxyapatite: an approach to control physio-chemical properties like degradation, bioactivity and thermal stability**

G. Suresh Kumar\*, E. Girija, Periyar University, India; A. Thamizhavel, Tata Institute of Fundamental Research, India; Y. Yokogawa, Osaka City University, Japan; S. Narayana Kalkura, Anna University, India

**(ICACC-S5-P054-2011) Effect of surface roughness of 45S bioactive glass on gene expression of MC3T3 pre-osteoblast cells**  
R. H. Jain\*, J. Marzillier, M. M. Falk, H. Jain, Lehigh University, USA

**(ICACC-S5-P055-2011) A newly formulated Lactic acid and Na lactate-buffered body fluid solution for the biomimetic coating of titanium alloy surfaces with calcium phosphate**  
A. Pasinli, M. Yuksel, Ege University, Turkey; E. Celik, Dokuz Eylul University, Turkey; S. Sener, Ege University, Turkey; A. Tas\*, Yeditepe University, Turkey

**(ICACC-S5-P056-2011) Fabrication of porous Ag doped Hydroxylapatite coating with antibacterial properties Electrostatic Spray Deposition (ESD) method**  
O. Gokcekaya\*, Istanbul Technical University, Turkey

**(ICACC-S5-P057-2011) Fabrication of nanoporous glass fiber for flexible bioscaffolds and other products**  
H. M. Moawad, H. Jain\*, Lehigh University, USA

**(ICACC-S9-P058-2011) Porous Hybrid Al<sub>2</sub>O<sub>3</sub>-Based Ceramics Prepared by Freeze Casting and Organic Surface Modifications**  
R. Chen\*, M. White, Dalhousie University, Canada

**(ICACC-S9-P059-2011) The Characteristic Study of Porous Glass-Ceramics for High Transmission of Sun Light**  
J. Wang\*, F. Chun, F. Shen, National Sun Yat-sen University, Taiwan

**(ICACC-S9-P060-2011) SiC foams for high temperature applications**  
S. Gianella, Erbicool, Switzerland; A. Ortona\*, SUPSI-ICIMSI, Switzerland

**(ICACC-S9-P061-2011) Macrocellular silicon carbide foam with hierarchical porosity**  
M. Fukushima\*, National Institute of Advanced Industrial Science and Technology (AIST), Japan; P. Colombo, Universit di Padova, Italy

**(ICACC-S9-P062-2011) Intentionally Porous Alumina**  
M. Vadala\*, D. C. Lupascu, University of Duisburg Essen, Germany

**(ICACC-S9-P063-2011) Fabrication and characterization of ceramic foams produced on polymer templates**  
P. Sooksaen\*, J. Chanintornthep, J. Burapakusolsri, C. Chuenprasertwong, Silpakorn University, Thailand

**(ICACC-S9-P065-2011) Materials from particle-stabilized foams and emulsions**  
M. Mücklich\*, U. T. Gonzenbach, F. Krauss Juillerat, P. N. Sturzenegger, B. Seeber, P. Elser, E. Tervoort, L. Gauckler, ETH Zürich, Switzerland

**(ICACC-S9-P066-2011) High Contrast Tomography of Soft material, Membranes and Porous Composites beyond Sub micron Resolution**  
S. H. Lau\*, Xradia Inc., USA; J. R. McCutcheon, University of Connecticut, USA; L. Hunter, T. Fong, J. Gelb, A. Gu, W. Yun, Xradia Inc., USA

**(ICACC-S13-P068-2011) Preparation of C/B4C/SiC composites using self sintering materials**  
J. Narciso\*, M. Martínez-Escandell, J. M. Ramos-Fernandez, J. Sánchez-Coronado, F. Rodríguez-Reinoso, Alicante University, Spain

**(ICACC-S13-P069-2011) Strength Evaluation of Ultra-fine Grained Graphite by Miniature Equibiaxial Flexural Test**  
Y. Katoh\*, G. Vasudevamurthy, Oak Ridge National Laboratory, USA; S. Kondo, Kyoto University, Japan

**(ICACC-S13-P070-2011) A new single-step brazing for joining CFC to copper**  
M. Salvo, V. Casalegno, Politecnico di Torino, Italy; T. Koppitz, G. Pintsuk, EURATOM Association, Germany; M. Ferraris\*, Politecnico di Torino, Italy

**(ICACC-S13-P071-2011) Comparative studies of radiation resistance of the Boron Nitride and C2C ceramics Al<sub>2</sub>O<sub>3</sub> on Plasma-Focus PF-1000 device**  
V. A. Gribkov\*, The Abdus Salam International Centre for Theoretical Physics, Italy; E. V. Demina, A. V. Dubrovsky, V. N. Pimenov, S. V. Maslyayev, A.A. Baikov Institute of Metallurgy and Material Science, Russian Federation; R. Gaffka, M. Gryaznevich, EURATOM/CCFE Fusion Association, Culham Science Centre, United Kingdom; E. Składnik-Sadowska, A. Soltan Institute for Nuclear Studies, Poland; R. A. Miklaszewski, M. Paduh, M. Scholz, Institute of Plasma Physics and Laser Microfusion, Poland

**(ICACC-S13-P072-2011) Effect of neutron radiation on mechanical properties of B4C**  
Z. Xia\*, E. Flitsyan, N. Orlovskaya, University of Central Florida, USA; T. Graule, J. Kuebler, Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland

**(ICACC-S13-P073-2011) Compositional effect of ceramic breeder on compatibility with SiC under HFIR irradiation**  
H. Katsui\*, Institute for Materials Research, Tohoku University, Japan; A. Hasegawa, Tohoku University, Japan; Y. Katoh, Oak Ridge National Laboratory, USA; T. Hinoki, Institute of Advanced Energy, Kyoto University, Japan; S. Nogami, Tohoku University, Japan; T. Tanaka, National Institute for Fusion Science, Japan; T. Shikama, Institute for Materials Research, Tohoku University, Japan

**(ICACC-S13-P156-2011) Fabrication of SiC Inert Matrix Fuel through a Polymer Precursor Route with Controlled Porosity and Superior Mechanical Properties**  
C. Shih\*, J. S. Tulenko, R. H. Baney, University of Florida, USA

**(ICACC-S13-P157-2011) Reprocessing Silicon Carbide Inert Matrix Fuel by Molten Salt Hot Corrosion Enhanced by Water Vapor**  
T. Cheng\*, R. H. Baney, J. Tulenko, University of Florida, USA

**(ICACC-S14-P074-2011) Ultrahigh Rate Capability and Phase Stability of Spinel LiMn<sub>2</sub>O<sub>4</sub> Nanowires as Cathode Materials for Li-ion Battery**  
H. Lee\*, M. Pandurangan, KAIST, Republic of Korea; R. Ruffo, Università degli Studi di Milano-Bicocca, Italy; D. Kim, KAIST, Republic of Korea

## Wednesday, January 26, 2011

### S1: Mechanical Behavior and Performance of Ceramics & Composites

#### Composites: Fibers, Matrices, Interfaces and Applications

Room: Coquina Salon A

Session Chairs: Walter Krenkel, Universität Bayreuth; Dileep Singh, Argonne National Laboratory

**8:00 AM**

**(ICACC-S1-033-2011) Ceramic Composites for Hypersonic Applications (Invited)**  
D. B. Marshall\*, B. N. Cox, O. Sudre, S. Lucato, J. B. Davis, Teledyne Scientific, USA

**8:30 AM**

**(ICACC-S1-034-2011) Ultra-high-temperature ceramics for aerospace and solar energy applications**  
D. Sciti\*, S. Guicciardi, L. Silvestroni, A. Bellosi, National Research Council - CNR, Italy

**8:50 AM**

**(ICACC-S1-035-2011) Novel High Temperature Wound Oxide Ceramic Matrix Composites manufactured via Freeze Gelation Process**  
T. Machry\*, EADS Innovation Works, Germany; D. Koch, Univ. of Bremen, Germany; C. Wilhelmi, EADS Innovation Works, Germany

**9:10 AM**

**(ICACC-S1-036-2011) Processing of Advanced Oxide/Oxide Composites for Gas Turbine Applications Based on Tailored Textile Technologies**  
C. Wilhelmi\*, T. Machry, EADS Innovation Works, Germany; R. Knoche, ASTRIUM Space Transportation, Germany; D. Koch, Univ. of Bremen, Germany

**9:30 AM**

**Break**

**9:50 AM**

**(ICACC-S1-037-2011) Design and Development Approach for Gas Turbine Combustion Chambers made of Oxide Ceramic Matrix Composites**  
R. Knoche\*, E. Werth, M. Weth, J. Gomez-Garcia, ASTRIUM Space Transportation, Germany; C. Wilhelmi, EADS Innovation Works, Germany; M. Gerendas, Rolls-Royce Germany, Germany

**10:10 AM**

**(ICACC-S1-038-2011) Effect of microstructure on room and high temperature properties of oxide/oxide composites developed for gas turbine applications**

D. Koch\*, K. Tushtev, K. Rezwani, C. Wilhelmi, S. Denis, J. Göring, Univ. of Bremen, Germany

**10:30 AM**

**(ICACC-S1-039-2011) Oxide Fiber Coatings for SiC/SiC Composites**

E. E. Boakye\*, P. Mogilevsky, T. A. Parthasarathy, UES Inc., USA; M. M. Cinibulk, Air Force Research Laboratory, Materials Directorate, Wright Patterson Air Force Base, USA; H. S. Randall, Air Force Research Laboratory, Materials Directorate, Wright Patterson Air Force Base, USA; M. Ahrens, Air Force Research Laboratory, Materials Directorate, Wright Patterson Air Force Base, USA

**10:50 AM**

**(ICACC-S1-040-2011) Transmission Electron Microscopy of Damage to Rare Earth Orthophosphate Fiber-Matrix Interphases that Deform with Transformation Plasticity during Fiber Push-Out**

R. Hay\*, G. Fair, AFRL, USA; E. Boakye, P. Mogilevsky, T. Parthasarathy, UES, Inc., USA; M. Ahrens, T. Godar, Wright State University, USA

**11:10 AM**

**(ICACC-S1-041-2011) Toughness Optimisation of a Metallic Fibre Reinforced Ceramic Composite (MFC)**

S. R. Pemberton\*, T. W. Clyne, University of Cambridge, United Kingdom; L. Marston, Fiberstone Products Limited, United Kingdom

**11:30 AM**

**(ICACC-S1-042-2011) Structural behaviour of bamboo composites**

B. N. Muthuraman\*, Rajalakshmi Engineering College, India

**S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications**

**Functionally Graded Coatings and Interfaces**

Room: Coquina Salon G

Session Chairs: Jow-Lay Huang, National Cheng Kung University; Yongho Sohn, University of Central Florida

**8:00 AM**

**(ICACC-S2-032-2011) Growing Integration Layer [GIL] Method: Coating and Joining of Functional Ceramic Layers on Metallic Materials in Solution without Firing Processes (Invited)**

M. Yoshimura\*, N. Matsushita, Tokyo Institute of Technology, Japan

**8:30 AM**

**(ICACC-S2-033-2011) Development of Oxide Ceramic APS Coatings for Microwave Absorption (Invited)**

M. Floristan\*, University of Stuttgart, Germany; P. Müller, A. Gebhardt, A. Killinger, R. Gadow, IFKB University of Stuttgart, Germany; A. Cardella, European Commission, Germany; C. Li, Max-Planck-Institut für Plasmaphysik, Germany

**9:00 AM**

**(ICACC-S2-034-2011) Functionalization of silica surface with silane coupling agent for rubber composite**

J. Yoo\*, Korea Institute of Ceramic Engineering & Technology, Republic of Korea; G. Lee, Korea University, Republic of Korea; D. Yun, Korea Institute of Ceramic Engineering & Technology, Republic of Korea

**9:20 AM**

**(ICACC-S2-035-2011) Interfacial structure of V2AlC thin film on (0001) and (11-20)-sapphire**

D. P. Sigumonrong, J. Zhang\*, Materials Chemistry, RWTH-Aachen University, Germany; Y. Zhou, Shenyang National Laboratory for Materials Science, Institute of Metal Research, China; D. Music, J. M. Schneider, Materials Chemistry, RWTH-Aachen University, Germany

**9:40 AM**

**Break**

**Advanced Coating Characterization Methods and Non-Destructive Evaluation**

Room: Coquina Salon G

Session Chairs: Yongho Sohn, University of Central Florida; Jow-Lay Huang, National Cheng Kung University

**10:00 AM**

**(ICACC-S2-036-2011) Evolution of Raman lines of t'-YSZ with high-temperature aging**

A. M. Limarga, Harvard University, USA; J. Iveland, University of California, USA; M. Gentleman, Texas A&M University, USA; D. M. Lipkin, GE Research, USA; D. R. Clarke\*, Harvard University, USA

**10:20 AM**

**(ICACC-S2-037-2011) Monitoring Delamination of Thermal Barrier Coatings During Interrupted High-Heat-Flux Laser Testing Using Luminescence Imaging**

J. I. Eldridge\*, D. Zhu, NASA Glenn Research Center, USA; D. E. Wolfe, The Pennsylvania State University, USA

**10:40 AM**

**(ICACC-S2-038-2011) Deposition Gas Turbines Thermal Barrier Coatings with Thermographic Phosphors for Temperatures Measurement**

E. H. Jordan\*, M. Majewski, C. Kelley, M. Renfro, University of Connecticut, USA

**11:00 AM**

**(ICACC-S2-039-2011) Thermal Imaging Measurement Accuracy for Thermal Properties of Thermal Barrier Coatings**

J. Sun\*, Argonne National Laboratory, USA

**11:20 AM**

**(ICACC-S2-040-2011) Determination of Average Surface Temperature of Thermal Barrier Coatings During Engine Operation and its Application to Assessment of Ex-Service Parts**

G. Witz\*, H. Bossmann, M. Schaudinn, S. Bachegowda, Alstom (Switzerland) Ltd, Switzerland

**11:40 AM**

**(ICACC-S2-041-2011) Thermal Diffusivity Measurement by Thermographic Technique for the Non Destructive Integrity Assessment of TBCs Coupons**

F. Cernuschi\*, Enea Ricerca per il Sistema Elettrico, Italy; P. Bison, S. Marinetti, CNR-ITC, Italy; S. Capelli, L. Lorenzoni, Enea Ricerca per il Sistema Elettrico, Italy; E. Campagnoli, Politecnico di Torino, Italy

**S3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology**

**Electrodes II**

Room: Coquina Salon E

Session Chairs: Nguyen Minh, Consultant; Tatsumi Ishihara, Kyushu University

**8:00 AM**

**(ICACC-S3-030-2011) Modification of SDC-LSCF cathode functional layer by solution infiltration**

S. Lee\*, N. Miller, H. Abernathy, K. Gerdes, M. Manivannan, U.S. Dept of Energy, National Energy Technology Laboratory, USA

**8:20 AM**

**(ICACC-S3-031-2011) In-situ XRD of Operating SOFC Cathodes**

J. Hardy\*, J. Templeton, Z. Lu, J. Stevenson, Pacific Northwest National Laboratory, USA

**8:40 AM**

**(ICACC-S3-032-2011) Influence of the operation parameters on LSCF and LSF cathodes degradation**

A. Arregui\*, University of Trento, Italy; L. Rodriguez, IKERLAN S.Coop., Spain; S. Modena, M. Bertoldi, SOFCPOWER S.r.l., Italy; J. van Herle, EPFL, Switzerland; V. Sglavo, University of Trento, Italy

9:00 AM

**(ICACC-S3-033-2011) Effects of oxygen partial pressure on the sintering behavior of LSM – YSZ cathode**  
M. Mahapatra, P. Singh\*, University of Connecticut, USA

9:20 AM

Break

## Electrolytes

Room: Coquina Salon E

Session Chairs: Tatsumi Ishihara, Kyushu University; Nguyen Minh, Consultant

10:00 AM

**(ICACC-S3-035-2011) Novel and superior solid oxide fuel cell with 1  $\mu\text{m}$  thick 8YSZ electrolyte layer**

T. Van Gestel\*, F. Han, H. Buchkremer, D. Stöver, Forschungszentrum Jülich, Germany

10:20 AM

**(ICACC-S3-036-2011) Industrial-scale magnetron sputter deposition of YSZ and CGO thin films for SOFC applications**

S. Sonderby\*, Danish Technological Institute, Denmark; A. J. Nielsen, Aarhus University, Denmark; B. H. Christensen, K. P. Almqvist, L. P. Nielsen, Danish Technological Institute, Denmark; J. Bottiger, Aarhus University, Denmark; P. Eklund, Linköping University, Sweden

10:40 AM

**(ICACC-S3-037-2011) Defect equilibria, electrical properties, and thermo-chemical expansion of Pr doped ceria**

S. Bishop\*, J. Kim, W. Jung, Massachusetts Institute of Technology, USA; T. Stefanik, Nanocerox, USA; D. Chen, H. Tuller, Massachusetts Institute of Technology, USA

11:00 AM

**(ICACC-S3-038-2011) Circumventing Strontium Segregation in Strontium-doped La-Monazite Ceramics**

M. Ng, J. C. Lucio-Vega, P. Morgan, M. L. McCartney\*, University of California, Irvine, USA

11:20 AM

**(ICACC-S3-039-2011) Materials for components of Solid Oxide Fuel Cells**

A. K. Suri\*, A. K. Sahu, D. Prakash, Bhabha Atomic Research Centre, India

## S4: Armor Ceramics

### Nondestructive Characterization

Room: Coquina Salon D

Session Chair: Lisa Prokurat Franks, TARDEC

8:00 AM

**(ICACC-S4-031-2011) Nondestructive Evaluation of Armor Ceramics (Invited)**

R. B. Thompson, L. Brasche\*, Iowa State University, USA

8:30 AM

**(ICACC-S4-032-2011) Determination of Bulk Heterogeneity Size Distributions in Armor Grade SiC Through Acoustic Spectroscopy**

A. Portune\*, R. Haber, Rutgers University, USA

8:50 AM

**(ICACC-S4-033-2011) Ultrasonic Nondestructive Characterization and its Correlation to Alumina Microstructure**

S. Bottiglieri\*, Rutgers University, USA

9:10 AM

**(ICACC-S4-034-2011) Low Velocity Impact Damage Characterization of Transparent Materials**

R. E. Brennan\*, W. H. Green, U.S. Army Research Laboratory, USA

9:30 AM

Break

9:50 AM

**(ICACC-S4-035-2011) Statistical Quantification and Sensitivity Prediction of Phased-Array Ultrasonic Data in Composite Ceramic Armor**

J. Steckenrider\*, Illinois College, USA; T. J. Meitzler, U.S. Army, USA; W. A. Ellingson, Argonne National Laboratory, USA; L. Prokurat Franks, U.S. Army, USA

10:10 AM

**(ICACC-S4-036-2011) Comparison of Penetration Damage in Novel Mg Specimens via Computed Tomography**

W. H. Green\*, K. C. Cho, U.S. Army Research Laboratory, USA

10:30 AM

**(ICACC-S4-037-2011) Application of a Miniaturized Portable Microwave Interference Scanning System for Nondestructive Testing of Composite Ceramic Armor**

K. Schmidt\*, J. Little, Evisive, Inc., USA; W. Ellingson, Argonne National Laboratory, USA; L. P. Franks, US Army RDC TARDEC, USA; W. Green, US Army Research Laboratory, USA

## Multi-Scale Modeling I

Room: Coquina Salon D

Session Chair: Lisa Prokurat Franks, TARDEC

10:50 AM

**(ICACC-S4-038-2011) Multiscale Modeling of Armor Ceramics: Focus on AION (Invited)**

G. A. Gazonas\*, USARL, USA

11:20 AM

**(ICACC-S4-039-2011) Atomic structure and elastic properties at high pressure of aluminum oxynitride in cubic phase**

I. G. Batyrev\*, B. M. Rice, G. A. Gazonas, J. W. McCauley, US Army Research Laboratory, USA

11:40 AM

**(ICACC-S4-040-2011) First Principles Calculation of Stress Induced Amorphization in Boron Carbide**

D. Taylor\*, Army Research Laboratory, USA; T. Wright, Johns Hopkins University, USA; J. McCauley, Army Research Laboratory, USA

## S5: Next Generation Bioceramics jointly with S9: Porous Ceramics

### Porous Bioceramics I (joint with Symposium 9)

Room: Ponce de Leon

Session Chairs: Donglu Shi, University of Cincinnati; Aldo Boccaccini, University of Erlangen-Nuremberg

8:00 AM

**(ICACC-S5-001-2011) Development of Nano-Macro Porous Bioactive Glass for Biomedical Applications (Invited)**

S. Wang, H. M. Moawad, Lehigh University, USA; Y. Vueva, IST/UTL, Portugal; A. Rashad, Alexandria University, Egypt; M. Saad, Alexandria University, Egypt; R. Almeida, IST/UTL, Portugal; M. Falk, Lehigh University, USA; M. Marei, Alexandria University, Egypt; H. Jain\*, Lehigh University, USA

8:30 AM

**(ICACC-S5-002-2011) Preparation and Characterization of Porous Wollastonite-Hydroxyapatite Bioceramics from a Pre-ceramic Polymer Filled with Nano-particles (Invited)**

E. Bernardo\*, P. Colombo, University of Padova, Italy; I. Cacciotti, A. Bianco, University of Rome "Tor Vergata", Italy; R. Bedini, P. Raffaella, Italian National Institute of Health, Italy; L. Treccani, K. Rezwani, University of Bremen, Germany

9:00 AM

**(ICACC-S5-003-2011) Bioactive Calcium Phosphates and their Use for Composite Scaffolds in Bone Tissue Engineering (Invited)**

M. Wang\*, The University of Hong Kong, Hong Kong

9:30 AM

Break

**9:50 AM****(ICACC-S5-004-2011) Morphological Control of Freeze-Cast Ceramics with Different Compositions (Invited)**

M. White\*, R. Chen, Dalhousie University, Canada

**10:20 AM****(ICACC-S5-005-2011) Hydroxyapatite scaffolds for bone tissue engineering with controlled porosity and mechanical strength**

V. M. Sglavo\*, A. Madinelli, M. Piccinini, University of Trento, Italy; F. Buccioti, Eurocoating spa, Italy

**10:40 AM****(ICACC-S5-006-2011) Nanocrystalline apatite coatings for porous bioceramics; role on bone osteogenesis (Invited)**

H. Autefage, F. Briand-Mesange, A. Gomez-Brouchet, S. Paliere, J. Briot, University of Toulouse, France; S. Goncalves, Teknimed, France; S. Cazalbou, C. Combes, C. Drouet, A. Autefage, D. Mathon, P. Swider, C. C. Rey\*, University of Toulouse, France

**11:10 AM****(ICACC-S5-007-2011) Load bearing, biocompatible and bio absorbable porous scaffolds (Invited)**

S. Mullens\*, J. Luyten, VITO, Belgium

**11:40 AM****(ICACC-S5-008-2011) Development of porous ceramics with bioactive properties**

D. Koch\*, L. Treccani, B. Müller, M. Pulkin, K. Rezwani, Univ. of Bremen, Germany

**S7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications****Nanomaterials for Photocatalysis, Solar Hydrogen and Thermoelectrics**

Room: Coquina Salon C

Session Chairs: Mrinal Pai, Bhabha Atomic Research Centre; J. Morante, University of Barcelona

**8:00 AM****(ICACC-S7-021-2011) Chemical Approaches to Functional Nanostructures: Growth, Applications and Devices**

S. Mathur\*, University of Cologne, Germany

**8:20 AM****(ICACC-S7-022-2011) Microwave-assisted fabrication of nanostructured  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> films for solar-driven hydrogen generation**

B. Vaidhyanathan\*, S. Saremi-Yarahmadi, Loughborough University, United Kingdom; U. Wijayantha, Loughborough University, United Kingdom

**8:40 AM****(ICACC-S7-023-2011) Synthesis and properties of the mesoporous ceria zirconia solid solutions: Improvement of oxygen storage capacity**

S. Abdollahzadeh-Ghom, University of Barcelona, Spain; T. Andreu, IREC, Catalonia Institute for Energy Research, Spain; M. Epifani, Istituto per la Microelettronica e i Microsistemi, Italy; J. R. Morante\*, University of Barcelona, Spain

**9:00 AM****(ICACC-S7-024-2011) Photocatalytic Activity of 3- and 4-Layered Aurivillius Oxides**

V. L. Knox\*, E. J. Nichols, T. A. Nedimeyer, M. Haluska, S. T. Mixture, Alfred University, USA

**9:20 AM****(ICACC-S7-026-2011) A Review on Indium Titanate Based Photocatalysts for Water Splitting Reaction (Invited)**

M. R. Pai\*, A. M. Banerjee, S. R. Bharadwaj, Bhabha Atomic Research Centre, India

**9:50 AM**

Break

**10:10 AM****(ICACC-S7-027-2011) Nanostructured Fe-TiO<sub>2</sub> thin film modified by Zn-Fe<sub>2</sub>O<sub>3</sub> for solar hydrogen generation**

P. Sharma, P. Kumar, R. Shrivastav, S. Dass, V. R. Satsangi\*, Dayalbagh Educational Institute, India

**10:30 AM****(ICACC-S7-028-2011) Effect of Manganese incorporation on Photo-Electro-Chemical Application of Nano-Structured ZnO for Solar-Hydrogen Generation**

V. Sharma, P. Kumar, J. Shrivastava, A. Solanki, S. Upadhyay, N. Singh, V. R. Satsangi, S. Dass, R. Shrivastav\*, Dayalbagh Educational Institute, India

**10:50 AM****(ICACC-S7-029-2011) Nanofiber Networks as Electrode Materials for Li Ion Batteries by Electrospinning**

R. von Hagen, X. Song\*, A. Lepscha, M. Büyükyazi, S. Mathur, University of Cologne, Germany

**11:10 AM****(ICACC-S7-030-2011) Functional and Thermoelectric Properties of Multiwalled Carbon Nanotube and Zirconia Composites**

K. Ahmad\*, Tsinghua University, Pakistan; P. Wei, Tsinghua University, China

**S8: 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT) in honor of Professor Katsutoshi Komeya****Design-Oriented Manufacturing I**

Room: Coquina Salon B

Session Chairs: Wayne Kaplan, Technion - Israel Institute of Technology, Junichi Tatami, Yokohama National University

**8:30 AM****(ICACC-S8-033-2011) Microstructural Control of Ceramic Matrix Nanocomposites via Interface Complexions (Invited)**

W. D. Kaplan\*, G. Gluzer, M. Baram, Technion - Israel Institute of Technology, Israel

**9:00 AM****(ICACC-S8-034-2011) Hyperbranched Boron-modified Polysilazane as a Novel Single-source Precursor for SiBCN Ceramic**

J. Zou\*, L. An, University of Central Florida, USA

**9:20 AM****(ICACC-S8-035-2011) Synthesis of SiCN Ceramics from Polyvinylsilazanes with Varied Amounts of Vinyl Group**

Y. Chen\*, Y. Yu, L. An, University of Central Florida, USA

**9:40 AM**

Break

**10:00 AM****(ICACC-S8-036-2011) Microstructure control of Si<sub>3</sub>N<sub>4</sub> ceramics using nanocomposite particles prepared by dry mechanical treatment (Invited)**

J. Tatami\*, M. Noguchi, Yokohama National University, Japan; H. Nakano, Toyohashi University of Technology, Japan; T. Wakihara, K. Komeya, T. Meguro, Yokohama National University, Japan

**10:20 AM****(ICACC-S8-037-2011) Fabrication of CNT dispersed Si<sub>3</sub>N<sub>4</sub> ceramics by mechanical dry mixing technique**

A. Hashimoto\*, J. Tatami, T. Wakihara, K. Komeya, T. Meguro, Yokohama National University, Japan

**10:40 AM****(ICACC-S8-038-2011) Electrically conductive CNT-dispersed Si<sub>3</sub>N<sub>4</sub> ceramics having double percolation structure**

Y. Sara\*, T. Junichi, W. Toru, Y. Tomohiro, K. Katsutoshi, M. Takeshi, Yokohama National University, Japan; K. Katsutoshi,

**11:00 AM****(ICACC-S8-039-2011) High Thermal Conductivity and High Strength Sintered Reaction - Bonded Silicon Nitride Ceramics Fabricated by using Low Si powder**

D. Kusano\*, S. Adachi, G. Tanabe, Japan Fine Ceramic Co. Ltd., Japan; H. Hyuga, Y. Zhou, K. Hirao, National Institute of Advanced Industrial Science & Technology (AIST, Japan

**11:20 AM****(ICACC-S8-040-2011) Processing porous  $\beta$ -Si<sub>3</sub>N<sub>4</sub> ceramics in an air atmosphere furnace (Invited)**

A. Gandhi, K. P. Plucknett\*, Dalhousie University, Canada

**S9: Porous Ceramics is in joint session with S5: Bioceramics**

Room: Ponce de Leon

**S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)****Novel Processing I**

Room: Coquina Salon H

Session Chairs: John Halloran, University of Michigan; Sylvain Dubois, Laboratoire de Physique des Matériaux

**8:00 AM****(ICACC-S12-001-2011) Ultra-High Temperature Ceramic Coatings for Oxidation Protection of C-C Composites (Invited)**

E. L. Corral\*, University of Arizona, USA

**8:30 AM****(ICACC-S12-002-2011) Multi-Stage Spark Plasma Sintering To Develop ZrB<sub>2</sub>-18wt%SiC-xwt%TiSi<sub>2</sub> Composites With Better Properties**

B. Basu, N. Gupta\*, K. Reddy, K. Pavani, Indian Institute of Technology Kanpur, India

**8:50 AM****(ICACC-S12-003-2011) Spark Plasma Sintering of ZrB<sub>2</sub>-SiC-ZrC Ultra-High Temperature Ceramics**

L. Stanciu\*, A. Snyder, T. Hou, Purdue University, USA

**9:10 AM****(ICACC-S12-004-2011) Properties and microstructures of Hf-Al-C ceramic and related composites**

N. Hongqiang\*, L. Fangzhi, L. Jingjing, W. Jingyang, Z. Yanchun, Institute of Metal Research, Chinese Academy of Sciences, China

**9:30 AM**

Break

**Novel Processing II**

Room: Coquina Salon H

Session Chairs: Per Eklund, Linkoping University; Anne Joulain, University of Poitiers - CNRS

**9:50 AM****(ICACC-S12-005-2011) Low temperature growth of Cr<sub>2</sub>AlC and V<sub>2</sub>AlC thin films (Invited)**

J. M. Schneider, M. to Baben\*, Materials Chemistry, RWTH-Aachen University, Germany

**10:20 AM****(ICACC-S12-007-2011) Effects of Nb-dopant on oxidation behaviors of Ti<sub>3</sub>SiC<sub>2</sub> at 1000-1300oC**

L. Zheng\*, L. Sun, J. Wang, M. Li, Y. Zhou, Institute of metal reseach, chinese academy of sciences, China

**10:40 AM****(ICACC-S12-008-2011) Ti<sub>3</sub>AlC<sub>2</sub>/Al Composite Materials: From Synthesis to Mechanical Properties**

W. Wang, G. Laplanche, G. Bei, V. Gauthier-Brunet, A. Joulain, J. Bonneville, S. Dubois\*, Institut PPRIME, France

**11:00 AM****(ICACC-S12-009-2011) Novel synthesis method of ternary carbide powders**

S. Lee\*, B. An, H. Kim, KIMS, Republic of Korea

**S13: Advanced Ceramics and Composites for Nuclear Fusion Applications****Processing I**

Room: Oceanview

Session Chair: Sasa Novak, J. Stefan Insitute

**8:00 AM****(ICACC-S13-021-2011) Integrated R & D of SiC Matrix Ceramic Composites for Energy/Environmental Application (Invited)**

A. Kohyama\*, Y. Kohno, H. Kishimoto, K. Shimoda, J. Park, H. Jung, Y. Park, Muroran Institute of Technology, Japan

**8:30 AM****(ICACC-S13-022-2011) Processing of advanced non-oxide ceramics for nuclear energy systems**

A. K. Suri\*, R. Fotedar, K. Nagaiyar, Bhabha Atomic Research Centre, India

**8:50 AM****(ICACC-S13-023-2011) Innovative Alumina Jig designed for high temperature annealing of TRISO coated particles**

I. J. van Rooyen\*, CSIR National Laser Centre, South Africa; J. Steyn, C. A. Smal, National Laser Centre, CSIR, South Africa; J. H. Neethling, Nelson Mandela Metropolitan University, South Africa

**9:10 AM****(ICACC-S13-024-2011) Densification of SiC-matrix by hybrid process of EPD-PIP**

A. Ivekovic\*, G. Drazic, S. Novak, Jozef Stefan Institute, Slovenia

**9:30 AM****(ICACC-S13-025-2011) Effects of Preform Densification on Performance of Near-Net Shaped NITE-SiC/SiC Composites**

N. Nakazato\*, Y. Kohno, H. Kishimoto, J. Park, H. Jung, A. Kohyama, Muroran Institute of Technology, Japan

**9:50 AM**

Break

**Processing II and Mechanical Properties**

Room: Oceanview

Session Chair: Shaoming Dong, Shanghai Institute of Ceramics, Chinese Academy of Sciences

**10:10 AM****(ICACC-S13-026-2011) Preparation of SiCf/SiC composites by SITE process (Invited)**

S. Novak\*, A. Ivekovic, G. Drazic, Jozef Stefan Institute, SFA Euratom-MHEST, Slovenia

**10:40 AM****(ICACC-S13-027-2011) Influence of stress induced damage on the thermal properties of ceramic matrix composites**

J. L. Lamon\*, J. El Yagoubi, CNRS, France; J. Batsale, TREFLE, France; M. Le Flem, CEA Saclay DEN, France

11:00 AM

**(ICACC-S13-028-2011) Tensile Property Evaluation of Unidirectional CVI SiC/SiC Minicomposites Reinforced with Near-Stoichiometric SiC Fibers**

K. Ozawa\*, Y. Katoh, E. Lara-Curzio, Oak Ridge National Laboratory, USA; T. Nozawa, Japan Atomic Energy Agency, Japan; L. L. Snead, Oak Ridge National Laboratory, USA

11:20 AM

**(ICACC-S13-029-2011) Design Approaches for Nuclear Grade SiC/SiC for Gen IV Nuclear Applications**

R. J. Shinavski\*, Hyper-Therm HTC, Inc., USA

**S14: Advanced Materials and Technologies for Rechargeable Batteries****Lithium Batteries and Beyond**

Room: Coquina Salon F

Session Chairs: Stefan Adams, National University of Singapore; Laurence Croguennec, CNRS

8:30 AM

**(ICACC-S14-027-2011) Advanced Ultra-high Energy Density Batteries based on Protected Lithium Metal Electrodes (PLEs) Stable to Air and Water (Invited)**

S. Visco\*, E. Nimon, L. De Jonghe, PolyPlus Battery Company, USA

9:00 AM

**(ICACC-S14-028-2011) Electrochemical and Thermal Investigation of Graphite Anode Materials for Li-ion Batteries**

W. Lu\*, C. Lopez, A. Jansen, D. Dees, Argonne National Lab, USA

9:20 AM

**(ICACC-S14-030-2011) Development of High Performance Lithium/Sulfur Rechargeable Battery (Invited)**

K. Kim\*, H. Ahn, J. Ahn, Y. Choi, H. Ryu, G. Cho, Gyeongsang National University, Republic of Korea

9:50 AM

Break

10:10 AM

**(ICACC-S14-031-2011) Silicon-Based Composite Anode Materials for Lithium-Ion Battery**

T. Yoon, Dong-A University, Republic of Korea; H. H. Kung, Northwestern University, USA; J. Lee\*, Dong-A University, Republic of Korea

10:30 AM

**(ICACC-S14-032-2011) Three Dimensional Construction of Electrodes - Open Door to High Capacity Lithium Batteries**

J. Prochazka\*, L. Kavan, M. Zúkalova, JHI, Czech Republic; J. Postler, HE3DA, Inc., Czech Republic

10:50 AM

**(ICACC-S14-033-2011) Sodium-beta Rechargeable Battery Technology Development**

G. Tao\*, N. Weber, Materials and Systems Research Inc., USA

11:10 AM

**(ICACC-S14-034-2011) How Green is Battery Recycling? (Invited)**

L. Gaines\*, I. Belharouak, A. Burnham, J. Sullivan, Argonne National Laboratory, USA

**S1: Mechanical Behavior and Performance of Ceramics & Composites****Environmental Effects of Ceramics and Composites**

Room: Coquina Salon A

Session Chair: Randall Hay, AFRL

1:30 PM

**(ICACC-S1-043-2011) Kinetics of Passive and Active Oxidation of Hi-Nicalon-S SiC Fibers: Relationships between SiO<sub>2</sub> Scale Thickness, Crystallization, Residual Stress, Fiber Strength, and Fiber Microstructure**

R. Hay\*, G. Fair, AFRL, USA; P. Mogilevsky, UES, Inc., USA; R. Bouffieux, New Mexico Tech., USA; A. Hart, J. Clark, U. Cincinnati, USA

1:50 PM

**(ICACC-S1-044-2011) Fatigue of Hi-NICALON/HyprSiC Ceramic Matrix Composite at 1200°C in Air and in Steam**

J. Delapasse, M. Ruggles-Wrenn\*, Air Force Institute of Technology, USA; A. Chamberlain, J. Lane, T. Cook, Rolls-Royce Corporation, USA

2:10 PM

**(ICACC-S1-045-2011) Fatigue behavior of CMC under constant load at intermediate temperatures**

J. L. Lamon\*, R. Maurin, M. R'Mili, G. Fantozzi, P. Reynaud, N. Godin, CNRS, France

2:30 PM

**(ICACC-S1-046-2011) Creep Behavior of Polycrystalline YAG at 1300°C in Air and in Steam**

C. Armani, M. Ruggles-Wrenn\*, Air Force Institute of Technology, USA; R. Hay, Air Force Research Laboratory, USA; H. Lee, K. Keller, UES Inc., USA; G. Fair, Air Force Research Laboratory, USA; T. Parthasarathy, UES Inc., USA

2:50 PM

Break

3:10 PM

**(ICACC-S1-047-2011) Static fatigue of fiber bundles under constant deformation**

J. L. Lamon\*, M. R'Mili, CNRS, France

3:30 PM

**(ICACC-S1-048-2011) Creep Behavior of Nextel™610 and Nextel™720 Fiber Tows at Elevated Temperatures in Air and in Steam**

C. Armani, M. Ruggles-Wrenn\*, Air Force Institute of Technology, USA; G. Fair, Air Force Laboratory, USA

**Characterization**

Room: Coquina Salon A

Session Chair: Waltraud Kriven, University of Illinois at Urbana-Champaign

3:50 PM

**(ICACC-S1-049-2011) Phase Transformations in the Cadmia-Telluria-Tungstate System**

E. Ersundu, W. M. Kriven\*, University of Illinois at Urbana-Champaign, USA

4:10 PM

**(ICACC-S1-050-2011) X-ray studies of Phase Transformations in Tantalum Pentoxide**

P. Sarin\*, R. P. Haggerty, J. L. Bell, Z. D. Apostolov, W. M. Kriven, R. P. Haggerty, University of Illinois at Urbana-Champaign, USA

4:30 PM

**(ICACC-S1-051-2011) In Situ Studies of Phase Transformations in Ta<sub>2</sub>O<sub>5</sub> and DyNbO<sub>4</sub> by Hot Stage Microscopy**

D. R. Lowry\*, P. Sarin, W. M. Kriven, University of Illinois Urbana-Champaign, USA

4:50 PM

**(ICACC-S1-052-2011) Fracture Surface Characterization of Multilayer Ceramic-Polymer Composites**

P. A. Robinson\*, C. A. Wilson, J. J. Mecholsky, University of Florida, USA

## S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications

### Coatings to Resist Wear, Erosion and Tribological Loadings

Room: Coquina Salon G

Session Chairs: Irene Spitsberg, Kennametal, Inc.; Oyelayo Ajayi, Argonne National Laboratory

**1:30 PM**

#### (ICACC-S2-042-2011) Development of Coating Technology Platforms for Wear Component Applications (Invited)

S. Brahmandam\*, I. Spitsberg, D. Siddle, Kennametal Inc., USA

**2:00 PM**

#### (ICACC-S2-043-2011) Superhard, Ultra-Thick Nanocomposite Coatings and their Practical Applications (Invited)

R. Wei\*, Southwest Research Institute, USA

**2:30 PM**

#### (ICACC-S2-044-2011) Ceramic / Metal - Polymer Multilayer Coatings for Tribological Applications under Dry Sliding Conditions (Invited)

A. Rempp\*, R. Gadow, A. Killinger, IFKB University of Stuttgart, Germany; P. Guth, M. Widmann, Wittenstein Bastian GmbH, Germany

**3:00 PM**

Break

**3:20 PM**

#### (ICACC-S2-045-2011) Application of HVOF and HVFS for High Performance Cylinder Liner Coatings (Invited)

A. Manzat\*, R. Gadow, A. Killinger, IFKB University of Stuttgart, Germany

**3:50 PM**

#### (ICACC-S2-046-2011) Comparison of tribological and nanomechanical behavior of different diamond-like-carbon (DLC) coatings

N. Demas\*, A. Navratil, Argonne National Laboratory, USA; I. Shareef, Bradley University, USA; O. Ajayi, Argonne National Laboratory, USA

**4:10 PM**

#### (ICACC-S2-047-2011) Effect of Substrate Hardness on the Mechanical Properties of PVD Coatings

I. Shareef, Bradley University, USA; O. Ajayi\*, N. Demas, Argonne National Laboratory, USA

**4:30 PM**

#### (ICACC-S2-048-2011) Multilayer Coatings for Anti-Corrosion Applications

L. Lin, C. Qu, R. Kasica, Q. Fang, R. Miller, E. Pierce, E. McCarty, J. Fan, D. Edwards, G. Wynick, X. Wang\*, Alfred University, USA

**4:50 PM**

#### (ICACC-S2-049-2011) Processing and Tribological Properties of MoN/Cu Coatings

K. Pappacena\*, D. Singh, O. Ajayi, J. Routbort, O. Eryilmaz, Argonne National Laboratory, USA

**5:10 PM**

#### (ICACC-S2-050-2011) Properties of SiAlON and SiZrON Coatings Deposited by Reactive Magnetron Co-Sputtering

M. Byrne, T. Bremm, R. J. Lad\*, University of Maine, USA

## S3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

### Fuel Reforming

Room: Coquina Salon E

Session Chairs: Toshio Suzuki, National Institute of Advanced Industrial Science and Technology; S. (Elango) Elangovan, Ceramtec, Inc.

**1:30 PM**

#### (ICACC-S3-041-2011) Carbon dioxide reforming of methane for solid oxide fuel cells (Invited)

M. Kawano\*, H. Yoshida, K. Hashino, T. Inagaki, The Kansai Electric Power Co., Inc., Japan

**2:00 PM**

#### (ICACC-S3-042-2011) Reforming of Liquid Hydrocarbon Fuels Using Non-thermal Plasma Reactor

S. Elangovan\*, J. Hartvigsen, P. Czernichowski, L. Frost, Ceramtec, Inc., USA

### Electrochemical/Mechanical/Thermal Performance

Room: Coquina Salon E

Session Chairs: S. (Elango) Elangovan, Ceramtec, Inc.; Toshio Suzuki, National Institute of Advanced Industrial Science and Technology

**2:20 PM**

#### (ICACC-S3-043-2011) Development of A Functional Layer for Direct Use of Hydrocarbon Fuel using Microtubular Solid-Oxide Fuel Cells

T. Suzuki\*, T. Yamaguchi, K. Hamamoto, Y. Fujishiro, M. Awano, National Institute of Advanced Industrial Science and Technology, Japan; N. Sammes, Colorado School of Mines, USA

**2:40 PM**

#### (ICACC-S3-044-2011) Development of a standard SOFC test fixture for materials and processing evaluation

Y. Chou\*, E. T. Thomsen, J. P. Choi, W. E. Voldrich, J. W. Stevenson, Pacific Northwest National Laboratory, USA

**3:00 PM**

Break

**3:20 PM**

#### (ICACC-S3-045-2011) Enhanced Densification of the Ceria Interlayer in Solid Oxide Fuel Cells

J. Hardy, Z. Lu\*, J. W. Templeton, J. W. Stevenson, Pacific Northwest National Laboratory, USA

**3:40 PM**

#### (ICACC-S3-047-2011) Thermo-mechanical Properties of Scandia and Ceria Doped Zirconia Electrolyte Material for SOFCs

N. Orlovskaya, University of Central Florida, USA; W. Lim, M. Tanjea, Texas A&M University, USA; J. Kuebler, EMPA, Swaziland; M. Radovic\*, Texas A&M University, USA

**4:00 PM**

#### (ICACC-S3-048-2011) Mechanical and Electrical Properties of Porous Ni-YSZ for Anode-Supported SOFC Application

A. R. Ballal\*, Visvesvaraya National Institute of Technology, India; S. N. Malhotra, P. Gopalan, Indian Institute of Technology Bombay, India; D. Prakash, P. Sinha, B. P. Sharma, Bhabha Atomic Research Center Vashi Complex, India

**4:20 PM**

#### (ICACC-S3-049-2011) Transient Thermal Stress Analysis of Planar-SOFC PEN Structure under Realistic Temperature Field

G. Iqbal, S. Pakalapati, H. Guo, I. Celik, B. Kang\*, West Virginia University, USA

**S4: Armor Ceramics****Multi-Scale Modeling II**

Room: Coquina Salon D

Session Chair: Raymond Brennan, U.S. Army Research Laboratory

**1:30 PM****(ICACC-S4-041-2011) Modeling amorphization in boron carbide under uniaxial compression**

W. Ching\*, S. Aryal, University of Missouri-Kansas City, USA

**1:50 PM****(ICACC-S4-042-2011) Length Scale Effects on the Dynamic Failure Strengths of Brittle Materials**

N. Daphalapurkar\*, K. T. Ramesh, L. Graham-Brady, The Johns Hopkins University, USA

**2:10 PM****(ICACC-S4-043-2011) A Scaled Model Describing the Rate-Dependent Compressive Strength of Brittle Materials**

J. Kimberley\*, G. Hu, K. T. Ramesh, The Johns Hopkins University, USA

**Manufacturing**

Room: Coquina Salon D

Session Chair: Raymond Brennan, U.S. Army Research Laboratory

**2:30 PM****(ICACC-S4-044-2011) Improving Radio Frequency Lamination Method for Armor Panels**

S. M. Allan\*, M. Fall, H. Shulman, Ceralink Inc, USA

**2:50 PM****(ICACC-S4-045-2011) Manufacture of Armor Tiles and Modules by Encapsulating Ceramic with Aluminum and Aluminum Metal Matrix Composites**

J. P. Sorensen\*, R. Adams, CPS TECHNOLOGIES CORP, USA

**3:10 PM****Break****3:30 PM****(ICACC-S4-046-2011) Chemical Interactions and Effect of Impurities in Transparent Polycrystalline Magnesium Aluminate Spinel Hot Pressed with LiF**

M. Rubat du Merac\*, I. Reimanis, C. Smith, Colorado School of Mines, USA; H. Kleebe, Technical University of Darmstadt, Germany

**3:50 PM****(ICACC-S4-047-2011) Large Area, High Volume Transparent Spinel Composite Ballistic Protection**

J. Kutsch\*, Technology Assessment &amp; Transfer, Inc., USA

**4:10 PM****(ICACC-S4-048-2011) Transparent Armor for the New Standard in Battlefield Performance**

J. J. Carberry\*, K. T. Leighton, SCHOTT Diamondview Armor Products, LLC, USA; D. W. Templeton, U.S. Army, USA

**4:30 PM****(ICACC-S4-049-2011) Hybrid Monolithic Ceramic/Ceramic Matrix Composites; from Turbine Airfoils to Armor**

J. E. Holowczak\*, C. E. Bird, R. A. Barth, W. K. Tredway, United Technologies Research Center, USA

**4:50 PM****(ICACC-S4-050-2011) Characterization of Residual Stresses in SiC Based Tiles**

B. S. Munn\*, K. Li, Oakland University, USA; J. Zheng, K. Masters, US Army, USA

**S5: Next Generation Bioceramics jointly with S9: Porous Ceramics****Porous Bioceramics II (joint with Symposium 9)**

Room: Ponce de Leon

Session Chairs: Himanshu Jain, Lehigh University; Dietmar Koch, Univ. of Bremen

**1:00 PM****(ICACC-S5-009-2011) Polymer Ceramic Composites for Engineering Tissue-Tissue Interface (Invited)**

H. Lu\*, Columbia University, USA

**1:30 PM****(ICACC-S5-010-2011) Unveiling the Deformation and Toughening Mechanisms of Nacre (Invited)**

X. Li\*, University of South Carolina, USA

**2:00 PM****(ICACC-S5-011-2011) Nanostructured Ceramics: Potential, Challenges and Opportunities for Implant Applications (Invited)**

R. Bizios\*, UTSA, USA

**2:30 PM****(ICACC-S5-012-2011) Poly(ethylene glycol) conjugated nano-graphene oxide for photo-dynamic therapy (Invited)**

H. Dong, Z. Zhao, H. Wen, Y. Li, A. Shen, P. Frank, C. Lin, Tongji University, China; D. Shi\*, University of Cincinnati, USA

**3:00 PM****Break****3:20 PM****(ICACC-S5-013-2011) Structural investigation of nanosized carbonated hydroxyapatites (Invited)**

F. Babonneau\*, Y. Wang, N. Nassif, T. Azais, C. Bonhomme, Université Pierre et Marie Curie-Paris6 / CNRS, France; S. Hayakawa, A. Osaka, Okayama University, Japan

**3:40 PM****(ICACC-S5-014-2011) Ceramic Nanosensor and Breath Analyzer for Point-of-Care Diagnostics (Invited)**

P. Gouma\*, SUNY Stony Brook, USA

**4:00 PM****(ICACC-S5-015-2011) Hollow Hydroxyapatite Microspheres for Controlled Delivery of Proteins**

M. N. Rahaman\*, H. Fu, D. E. Day, Missouri University of Science and Technology, USA

**4:20 PM****(ICACC-S5-016-2011) Hierarchical Structure and Deformation Mechanisms of Bone (Invited)**

W. Wagermaier\*, M. Kerschnitzki, Max Planck Institute of Colloids and Interfaces, Germany; H. S. Gupta, Queen Mary, University of London, United Kingdom; P. Fratzl, Max Planck Institute of Colloids and Interfaces, Germany

**4:50 PM****(ICACC-S5-017-2011) High surface area nano-macro porous bioactive glass scaffold for hard tissue engineering**

S. Wang\*, H. Jain, Lehigh University, USA

**5:10 PM****(ICACC-S5-018-2011) A Simple Method to Synthesize "Naproxen-Layered Double Hydroxides" Nanohybrid**

S. Azimi\*, M. Solati-Hashjin, P. Khoshakhlagh, A. Darvish, Amirkabir University of Technology, Islamic Republic of Iran

**5:30 PM****(ICACC-S5-019-2011) Nanoscale Study of Hydrothermally Precipitated Hydroxyapatite and Ag-Doped Hydroxyapatite Coatings**

K. Zeytin\*, H. Kizil, C. Ergun, Istanbul Technical University, Turkey; M. Cuberes, University of Castilla-La Mancha, Spain

## S7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications

### Nanotubes, Nanorods, Nanowires and Other One-dimensional Structures

Room: Coquina Salon C

Session Chairs: Francisco Hernandez-Ramirez, Catalonia Institute for Energy Research; Gurpreet Singh, Kansas State Univ.

#### 1:30 PM

##### (ICACC-S7-034-2011) Formation and Surface Modification of Tin Oxide Nanowire Based Heterostructures for Device Applications (Invited)

J. Pan, M. Hoffmann, R. Mueller, H. Shen\*, S. Mathur, University of Cologne, Germany; J. Prades, F. Hernandez-Ramirez, University of Barcelona, Spain

#### 2:00 PM

##### (ICACC-S7-032-2011) Synthesis, Characterization and Testing of Polymer-derived Ceramic Composite Nanowires (Invited)

G. Singh\*, Kansas State Univ., USA

#### 2:30 PM

##### (ICACC-S7-033-2011) Investigating optical, electrical and structural properties of laterally grown heterojunctions of ZnO nanowires on GaN substrate (Invited)

B. Nikoobakht\*, National Institute of Standards and Technology, USA

#### 3:00 PM

Break

#### 3:20 PM

##### (ICACC-S7-031-2011) Synthesis and characterization of 0D and 1D functional oxide nanostructures (Invited)

F. Rosei\*, Université du Québec, Canada

#### 3:50 PM

##### (ICACC-S7-035-2011) Hydrothermal growth of patterned ZnO nanorods

M. Ladanov\*, G. Matthews, M. Ram, A. Kumar, University of South Florida, USA

#### 4:10 PM

##### (ICACC-S7-036-2011) Preparation and properties of flat (3-carboxypropyl)-ferrocene nanotubes

Q. Wu\*, Tongji University, China

#### 4:30 PM

##### (ICACC-S7-037-2011) Surface Ionization Gas Sensors based on Individual Metal Oxide Nanowires

F. Hernandez-Ramirez\*, Catalonia Institute for Energy Research, Spain; J. Prades, University of Barcelona, Spain; A. Hackner, EADS, Spain; J. Morante, Catalonia Institute for Energy Research, Spain; G. Mueller, EADS, Spain; S. Mathur, University of Cologne, Germany

#### 4:50 PM

##### (ICACC-S7-038-2011) Microwave Irradiation of Ruthenium on Undoped and N-Doped Carbon Nanotubes

L. F. Mabena\*, S. Sinha Ray, Council for Scientific and Industrial Research, South Africa; N. Coville, University of the Witwatersrand, South Africa

## S8: 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT) in honor of Professor Katsutoshi Komeya

### Design-Oriented Manufacturing II

Room: Coquina Salon B

Session Chairs: Yigal Blum, SRI International; Michael Halbig, US Army Research Laboratory

#### 1:30 PM

##### (ICACC-S8-041-2011) Affordable Ceramic Matrix Composites with Enhanced Design and Size Capabilities (Invited)

Y. Blum\*, SRI International, USA

#### 2:00 PM

##### (ICACC-S8-042-2011) Criticality of technologically strategic functional metals

A. Reller\*, University of Augsburg, Germany

#### 2:20 PM

##### (ICACC-S8-043-2011) DHS Advanced and High Performance Materials Database

G. Fischman\*, Future Strategy Solutions, USA

#### 2:40 PM

##### (ICACC-S8-044-2011) Synthesis of SiAlON phosphors by the reduction-nitridation method

T. Suehiro\*, Tohoku University, Japan

#### 3:00 PM

Break

#### 3:20 PM

##### (ICACC-S8-045-2011) Fabrication and Characterization of Brazed Joints for SiC-Metallic Systems Utilizing Refractory Metals

B. P. Coddington\*, R. Asthana, University of Wisconsin-Stout, USA; M. C. Halbig, US Army Research Laboratory, USA; M. Singh, Ohio Aerospace Institute, USA

#### 3:40 PM

##### (ICACC-S8-046-2011) Joining of Silicon Nitride Long Pipe by Local Heating

M. Hotta\*, N. Kondo, H. Hyuga, H. Kita, National Institute of Advanced Industrial Science and Technology (AIST), Japan

#### 4:00 PM

##### (ICACC-S8-047-2011) Ceramic Joining by Microwave Local Heating

N. Kondo\*, H. Hyuga, M. Hotta, H. Kita, K. Hirao, National Institute of Advanced Industrial Science and Technology (AIST), Japan

#### 4:20 PM

##### (ICACC-S8-048-2011) Interface Engineered Diamond Coatings for Dry Machining

H. Gomez\*, University of South Florida, USA; K. Chou, The University of Alabama, USA; X. Xiao, M. Lukitsch, General Motors, USA; A. Kumar, University of South Florida, USA

#### 4:40 PM

##### (ICACC-S8-049-2011) Tin Oxide-Based Ceramics for Sputtering Targets

E. Medvedovski\*, C. J. Szepesi, O. Yankov, Umicore Thin Film Products, USA

## S9: Porous Ceramics is in joint session with S5: Bioceramics

Room: Ponce de Leon

## S10: Thermal Management Materials and Technologies

### Nano Heat Transfer Fluids and Thermal Energy Storage

Room: Coquina Salon F

Session Chairs: Andrew Gyekenyesi, Ohio Aerospace Institute; Mrityunjay Singh, Ohio Aerospace Institute

**1:40 PM**

#### (ICACC-S10-001-2011) Enhanced Viscosity of Aqueous Silica Nanofluids

B. Jo, D. Banerjee\*, Texas A&M University, USA

**2:00 PM**

#### (ICACC-S10-002-2011) Engineering the Heat Transfer Nanofluids: The Efficiency Approach

E. V. Timofeeva\*, W. Yu, D. M. France, D. Singh, J. L. Routbort, Argonne National Laboratory, USA

**2:20 PM**

#### (ICACC-S10-003-2011) Enhancement of Heat Capacity of Molten Salt Eutectics Using Inorganic Nanoparticles for Solar Thermal Energy Applications

D. Banerjee, D. Shin\*, Texas A&M University, USA

**2:40 PM**

#### (ICACC-S10-004-2011) Enhancement of Heat Capacity of Nitrate Salts Using Mica Nanoparticles

S. Jung\*, D. Banerjee, Texas A&M University, USA

**3:00 PM**

Break

**3:20 PM**

#### (ICACC-S10-005-2011) Power Required to Pump Ceramic-Based Nanofluids

J. Routbort\*, D. Singh, W. Yu, R. K. Smith, E. Timofeeva, Argonne National Laboratory, USA

**3:40 PM**

#### (ICACC-S10-006-2011) Thermal energy storage nanocapsules

R. Rodriguez\*, M. Garcia de Cortazar, Inasmet-Tecnalia, Spain

**4:00 PM**

#### (ICACC-S10-007-2011) 3-Dimensional Modeling of Graphitic Foam Heat Sink

K. Alam\*, A. Bradu, Ohio University, USA

## S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

### New Materials

Room: Coquina Salon H

Session Chairs: Martin Magnuson, IFM; Yanchun Zhou, Aerospace Research Institute of Materials & Processing Technology

**1:30 PM**

#### (ICACC-S12-010-2011) Synthesis, microstructure and mechanical properties of $Ti_3Sn(1-x)AlxC_2$ MAX phase solid solutions

G. Bei, V. Gauthier-Brunet, C. Tomas, S. Dubois\*, Laboratoire de Physique des Matériaux, France, Institut PPRIME, France

**1:50 PM**

#### (ICACC-S12-011-2011) $(Ti_0.5Nb_0.5)5AlC_4$ : A New Layered Compound Belonging to MAX Phases

L. Zheng\*, J. Wang, X. Lu, F. Li, J. Wang, Y. Zhou, Institute of Metal Research, Chinese Academy of Sciences, China

**2:10 PM**

#### (ICACC-S12-012-2011) Novel insights into the mechanical properties and deformation behavior of MAX phase materials (Invited)

C. Tomas\*, A. Guitton, A. Joulain, L. Thilly, P. Villechaise, V. Gauthier-Brunet, S. Dubois, Institut Pprime, CNRS - Université de Poitiers - ENSMA, France

**2:40 PM**

#### (ICACC-S12-013-2011) Synthesis of $Ti_2Al(C_xN_{1-x})_y$ carbonitrides MAX phases

T. Cabioch\*, University of Poitiers, France; P. Eklund, Linköping University, Sweden; V. Mauchamp, M. Jaouen, University of Poitiers, France

**3:00 PM**

Break

## Novel Characterization

Room: Coquina Salon H

Session Chairs: Erica Corral, University of Arizona; Christophe Tomas, Institut Pprime

**3:20 PM**

#### (ICACC-S12-014-2011) Non-Contact Creep Characterization of ZrB<sub>2</sub>-SiC Composites with the Electromagnetic Mechanical Apparatus (Invited)

S. Gangireddy, J. W. Halloran\*, University of Michigan, USA; Z. N. Wing, Advanced Ceramics Manufacturing Inc., USA

**3:50 PM**

#### (ICACC-S12-015-2011) Stress measurement of Zr<sup>11</sup>B<sub>2</sub>/SiC composites using neutron diffraction and Raman spectroscopy

J. Watts\*, G. Hilmans, W. Fahrenholtz, Missouri University of Science and Technology, USA

**4:10 PM**

#### (ICACC-S12-016-2011) Anisotropy in the electronic structure of Ti<sub>3</sub>SiC<sub>2</sub> probed by x-ray emission spectroscopy in comparison to ab initio calculations (Invited)

M. Magnuson\*, IFM, Sweden; P. Eklund, L. Hultman, Linköping University, Sweden

**4:40 PM**

#### (ICACC-S12-017-2011) Macroscopic deformation mechanisms of MAX phases investigated by Transmission Electron Microscopy and In-Situ Neutron Diffraction

A. Guitton, G. Bei, A. Joulain\*, L. Thilly, C. Tomas, University of Poitiers, France

## S13: Advanced Ceramics and Composites for Nuclear Fusion Applications

### Composite Materials for Fusion Energy

Room: Oceanview

Session Chair: Akira Kohyama, Muroran Institute of Technology

**1:30 PM**

#### (ICACC-S13-030-2011) Carbon-carbon composites and tungsten for high heat flux components in future fusion reactors - a comparative analysis (Invited)

G. Pintsuk\*, Forschungszentrum Juelich, Germany

**2:00 PM**

#### (ICACC-S13-031-2011) Qualification of carbon-carbon composites as an armour material for the ITER divertor

J. Linke\*, T. Loewenhoff, G. Pintsuk, M. Roedig, C. Thomser, Research Center Juelich, Germany

**2:20 PM**

#### (ICACC-S13-032-2011) SiC materials for fusion reactor

J. Narciso\*, J. M. Molina, USA

2:40 PM

**(ICACC-S13-033-2011) SiC/SiC Composite Structures for Flow Channel Inserts**

R. J. Shinavski\*, A. M. Goetz, Hyper-Therm HTC, Inc., USA; G. E. Youngblood, Pacific Northwest National Laboratory, USA

3:00 PM

Break

**Ceramic Composites for Nuclear Applications**

Room: Oceanview

Session Chair: Jacques Lamon, CNRS

3:20 PM

**(ICACC-S13-034-2011) SiC-based Composites Potential for Applications in Advanced Nuclear Energy (Invited)**

S. Dong\*, B. Lu, Z. Wang, H. Zhou, L. Gao, P. He, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

3:50 PM

**(ICACC-S13-035-2011) Influence of fibres surface roughness on mechanical behaviour of minicomposites SiC/SiC based on Hi-Nicalon S and SA3 reinforcement**

C. Sauder\*, CEA, France; J. Lamon, INSA, France

4:10 PM

**(ICACC-S13-036-2011) Refractory Enhanced SiC Composites for Reactor Applications**

J. Steinbeck\*, D. Stebbins, F. S. Lauten, Physical Sciences Inc., USA

4:30 PM

**(ICACC-S13-037-2011) New Mechanical Test Standards for Carbon-Carbon and SiC-SiC Composites in the Very High Temperature Reactor (VHTR) Project**

S. T. Gonczy\*, Gateway Materials Technology, USA; Y. Katoh, Oak Ridge National Laboratory, USA

4:50 PM

**(ICACC-S13-048-2011) Active and passive oxidation of CVD-SiC under HTGR operating condition**

C. Kim\*, Korea Institute of Science and Technology, Republic of Korea; Y. Katoh, Oak Ridge National Laboratory, USA

**Poster Session B**

Room: Ocean Center

5:00 PM

**(ICACC-FS1-P075-2011) Correlation between Water Loss and Chemical Composition in Aged Alkaline Activated Metakaolin Based Geopolymers**

M. Lizcano\*, A. Gonzalez Elizondo, M. Radovic, Texas A&amp;M University, USA

**(ICACC-FS1-P076-2011) Mechanical Properties of Na and K Activated Metakaolin-Based Geopolymers**

M. Lizcano\*, H. Kim, M. Radovic, Texas A&amp;M University, USA

**(ICACC-FS1-P077-2011) Effect of Granulated Blast Furnace Slag Addition on Structure, Pore Architecture, and Strength Properties of Geopolymers**

T. Metroke, J. Eichler\*, Universal Technology Corporation, USA; M. V. Henley, M. I. Hammons, Air Force Research Laboratory, USA

**(ICACC-FS1-P078-2011) Blended Fly Ash Geopolymers**

G. M. Canfield\*, Oak Ridge Institute for Science and Education, USA; N. Brown, D. Nagler, Air Force Research Laboratory, USA; T. Metroke, Universal Technology Corporation, USA; M. V. Henley, Air Force Research Laboratory, USA

**(ICACC-FS1-P079-2011) Use of Carbon Dioxide-Treated Zeolites in the Carbonation of Portland Cement Paste**

S. W. Morefield\*, M. E. Marciano, R. Moser, C. A. Weiss, P. G. Malone, US Army ERDC-CERL, USA

**(ICACC-FS1-P080-2011) Stabilization of Un-surfaced Roads over Volcanic Gravel Materials Using Geopolymer Technology**

M. Sykes, P. Allison, P. Bly, D. Bailey, S. W. Morefield\*, C. A. Weiss, P. G. Malone, US Army ERDC-CERL, USA

**(ICACC-FS1-P155-2011) Geopolymer materials prepared from LiOH**  
Z. Cerny, L. Sule, J. Machacek, I. Jakubec, P. Bezdicka, P. Roubicek\*, Institute of Inorganic Chemistry, AVCR, v.v.i., Czech Republic**(ICACC-FS2-P081-2011) Metal-ceramic composites: optimal microstructure design for different loading cases**

R. Piat\*, Y. Sinchuk, Karlsruhe Institute of Technology, Germany

**(ICACC-FS2-P082-2011) Ab initio computations of the electronic, mechanical, and thermal properties of ultra high temperature ceramics (UHTC) ZrB<sub>2</sub> and HfB<sub>2</sub>**

J. W. Lawson\*, C. W. Bauschlicher, NASA Ames Research Center, USA; M. S. Daw, Clemson University, USA

**(ICACC-FS2-P083-2011) Thermo-kinetic Simulation of Low Temperature Sintering of Tableware Porcelain**

I. M. Mroz\*, U. Kahnert, J. G. Heinrich, Clausthal University of Technology, Germany

**(ICACC-S2-P084-2011) Effects of UV-radiation on the cleanability of titanium dioxide-coated glazed ceramic tiles**

M. Emami\*, Saveh University, Islamic Republic of Iran

**(ICACC-S2-P085-2011) Effects of the surface coating on yellow phosphors with TiO<sub>2</sub>**

J. Yoo\*, Korea Institute of Ceramic Engineering &amp; Technology, Republic of Korea; H. Lee, HanYang University, Republic of Korea

**(ICACC-S2-P086-2011) Melt Infiltration Processing of Titanium Carbonitride Cermet with a Ductile Nickel Aluminide Binder**

S. T. Buchholz\*, Z. N. Farhat, G. J. Kipourous, K. P. Plucknett, Dalhousie University, Canada

**(ICACC-S2-P087-2011) Laminated All Oxide Ceramic Composite Layers for Control of Radiation Heat Energy Transfer Direction and Energy at Elevated Temperatures**

M. Yamazoe\*, K. Matsumura, Y. Kagawa, The University of Tokyo, Japan

**(ICACC-S2-P088-2011) Synthesis and characterization of Nanocrystalline  $\alpha$ -cordierite**

F. Jahantigh\*, R. Malekfar, University Tarbiat Modares, Islamic Republic of Iran

**(ICACC-S2-P089-2011) Phase Stability and Thermal Conductivity of Composite Environmental Barrier Coatings on SiC/SiC Ceramic Matrix Composites**

D. Zhu\*, S. L. Benkel, NASA Glenn Research Center, USA

**(ICACC-S2-P090-2011) Slurry Based Environmental Barrier Coating (EBC) Infiltration on SiC/SiC Composite Preforms for Improved Oxidation Protection**

S. Ramasamy\*, G. Morscher, The University of Akron, USA; S. N. Tewari, Cleveland State University, USA; R. T. Bhatt, D. S. Fox, NASA Glenn Research Center, USA

**(ICACC-S2-P091-2011) The Influence of Spraying Parameters on Indentation Fracture Toughness of Plasma-Sprayed Zirconia Coatings**

S. Sadeghi-Fadaki\*, MUT, Islamic Republic of Iran

**(ICACC-S2-P092-2011) Microstructure of Nanoporous ZrO<sub>2</sub>-4mol% Y<sub>2</sub>O<sub>3</sub> Coatings Fabricated by Electron Beam-PVD**

B. Jang\*, Y. Sakka, National Institute for Materials Science, Japan; H. Matsubara, Japan Fine Ceramics Center, Japan; S. Kim, H. Kim, Korea Institute of Ceramic Engineering and Technology, Republic of Korea

**(ICACC-S2-P093-2011) Indentation Stress-Strain Behavior and Thermal Stability of Layered Thermal Barrier Coatings**

D. Lee, Kookmin University, Republic of Korea; Y. Jung, Changwon National University, Republic of Korea; U. Paik, Hanyang University, Republic of Korea; K. Lee\*, Kookmin University, Republic of Korea

**(ICACC-S2-P094-2011) Thermal Barrier Coatings Deposited Using the FARADAYIC EPD Process**

J. W. Kell\*, H. McCrabb, Faraday Technology, USA

**(ICACC-S2-P158-2011) Mechanical Properties and Durability of Advanced Environmental Barrier Coatings in Calcium-Magnesium-Alumino-Silicate Environments**

D. S. Miladinovich\*, D. Zhu, NASA Glenn Research Center, USA

**(ICACC-S3-P095-2011) Sintering of Co<sub>3</sub>MnO<sub>4</sub> spinels for protecting coating on stainless steel SOFC interconnectors**

A. L. Prette\*, V. M. Sglavo, University of Trento, Italy

**(ICACC-S3-P096-2011) Promising composite cathode materials on the base of La<sub>0.8</sub>Sr<sub>0.2</sub>MnO<sub>3</sub> for apatite-like solid state electrolyte La<sub>10</sub>Ge<sub>6</sub>O<sub>27</sub>**

M. Gorshkov, N. Bogdanovich, A. Neumin, E. Pikalova\*, Institute of High Temperature Electrochemistry, Russian Federation

**(ICACC-S3-P097-2011) Assessment of the Electrochemical Properties of Samarium and Praseodymium doped BSCF Perovskites**

K. Zhang, A. Verma, P. Singh\*, University of Connecticut, USA

**(ICACC-S3-P098-2011) Investigation of the Benefits of Current Collection Methods for Microtubular SOFCs**

T. Yamaguchi\*, Colorado School of Mines, USA; T. Suzuki, National Institute of Advanced Industrial Science and Technology, Japan; K. Galloway, N. Sammes, Colorado School of Mines, USA

**(ICACC-S3-P099-2011) Synthesis of  $\delta$ -bismuth oxide nanopowders via sol gel used in electrolyte of solid oxide fuel cell**

M. Mallahi\*, Khaje.Nasir.Toosi University of Technology, Islamic Republic of Iran; A. Shokuhtar, Khaje.Nasir.Toosi University of Technology, Islamic Republic of Iran; M. Vaezi, Khaje.Nasir.Toosi University of Technology, Islamic Republic of Iran

**(ICACC-S3-P100-2011) Effect of Co-doping on electrophysical properties of LnBaCo<sub>2</sub>O<sub>5+ $\delta$</sub>  (Ln = Sm, Nd)**

T. Zhuravleva\*, IHTe UB of RAS, Russian Federation

**(ICACC-S3-P101-2011) Investigation of BICUVOX Electrolytes for SOFC Applications**

E. M. Sabolsky\*, S. Razmyar, C. Ndhlovu, K. Sabolsky, West Virginia University, USA

**(ICACC-S3-P102-2011) Influence of Ce or Y Doping on the Electronic Conductivity of Scandia-stabilized Zirconia**

T. Shimonosono\*, H. Kishimoto, K. Yamaji, M. E. Brito, T. Horita, National Institute of Advanced Science and Technology (AIST), Japan; H. Yokokawa, Tokyo City University, Japan

**(ICACC-S3-P103-2011) Tape casting of (Sc<sub>2</sub>O<sub>3</sub>)<sub>0.10</sub>(CeO<sub>2</sub>)<sub>0.01</sub>(ZrO<sub>2</sub>)<sub>0.89</sub> thin electrolytes for the IT SOFCs**

Y. Chen\*, N. Orlovskaya, University of Central Florida, USA; J. Neutzler, X. Huang, University of South Carolina, USA

**(ICACC-S3-P104-2011) Solid state electrolytes on the base of CeO<sub>2</sub> for intermediate temperature electrochemical devices**

E. Pikalova\*, G. Fadeev, A. Demin, Institute of High temperature electrochemistry, Russian Federation

**(ICACC-S3-P105-2011) Electrophysical properties of Sr<sub>1-x</sub>PxTi<sub>0.5</sub>Fe<sub>0.5</sub>O<sub>3-d</sub> materials with perovskite structure**

V. Sergeeva, A. Murashkina, E. Pikalova\*, Institute of high temperature electrochemistry, Russian Federation

**(ICACC-S3-P106-2011) Investigation of Phosphene Tolerant Anodes for Solid Oxide Fuel Cells**

P. M. Gansor\*, C. Xu, J. Zondlo, K. Sabolsky, E. M. Sabolsky, West Virginia University, USA

**(ICACC-S3-P107-2011) The uncertainty in techniques for chemical composition determination of SOFC glass seal materials**

A. Shyam\*, R. Trejo, A. Serizawa, M. Miller, J. Giaquinto, Oak Ridge National Laboratory, USA; C. Bayne, Haselwood Services and Manufacturing, Inc, USA; D. Glasgow, R. Ilgner, T. Keever, E. Lara-Curzio, Oak Ridge National Laboratory, USA

**(ICACC-S6-P108-2011) Investigation on Phase Transformation of YBCO-In<sub>2</sub>O<sub>3</sub> Composite Superconductor Cooled Down Via Different Routes**

Y. M. Ahmed\*, Central Metallurgical Research and Development Institute, (CMRDI), Egypt; M. S. Hassan, Central Metallurgical Research and Development Institute, (CMRDI), Egypt, H. Abd-Elatif, Higher Institute of Optics Technology, Egypt

**(ICACC-S6-P109-2011) Morphologies and electrochemical capacitor behaviors of Co(OH)<sub>2</sub>/polyaniline composite films**

H. Itahara\*, T. Kobayashi, Toyota Central R&D Labs., Inc., Japan

**(ICACC-S6-P110-2011) Fabrication of LiCoO<sub>2</sub> thin film using hydrothermal Process**

C. Ni, C. Liu, K. Fung\*, National Cheng Kung University, Taiwan

**(ICACC-S6-P111-2011) Preparation of Pb-filled Chevrel-phase sulfides and their thermoelectric properties**

H. Nishiate\*, M. Ohta, A. Yamamoto, H. Obara, C. Lee, K. Ueno, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**(ICACC-S6-P112-2011) Optimization of Spark-Plasma-Sintering Conditions for Maximizing Figure of Merit of La-Doped SrTiO<sub>3</sub>**

A. Kikuchi\*, N. Okinaka, T. Akiyama, Hokkaido University, Japan

**(ICACC-S6-P113-2011) Development of high temperature thermoelectric converters**

A. Weidenkaff\*, A. Shkabko, S. Populoh, P. Tomes, M. Trottmann, EMPA, Switzerland

**(ICACC-S7-P114-2011) How Safe are Nanomaterials for Human Beings?**

L. Xiao, S. Stucky, O. Arslan, D. Hermann, S. Kremer, B. Müller, S. Mathur\*, University of Cologne, Germany; T. Thurnherr, Swiss Federal Laboratories of Materials Testing and Research, Switzerland; H. Krug, Swiss Federal Laboratories of Materials Testing and Research, Switzerland; J. Shi, A. Kunzmann, B. Fadeel, Karolinska Institute, Sweden

**(ICACC-S7-P115-2011) Visible Light Photocatalysis with Rare Earth Ions Doped TiO<sub>2</sub> Nanocomposites**

H. Narayan\*, H. Alemu, National University of Lesotho, Lesotho

**(ICACC-S7-P116-2011) Band Gap Engineering in Layered Oxides**

E. J. Nichols, V. L. Knox\*, S. T. Mixture, Alfred University, USA

**(ICACC-S7-P117-2011) The hydrothermal synthesis of pure BiFeO<sub>3</sub> nanopowders and their applications as visible-light photocatalysts**

C. Cho\*, Seoul National University, Republic of Korea; J. Kim, National Renewable Energy Laboratory, USA; J. Noh, K. Hong, Seoul National University, Republic of Korea

**(ICACC-S7-P118-2011) Formation of nanostructured carbonitride layers during implantation of NiTi**

A. D. Pogrebniak\*, Sumy State University, Ukraine; S. Bratushka, Sumy Institute for Surface Modification, Ukraine; N. Levintant, Institute of Fundamental Technological Research, Poland

**(ICACC-S7-P119-2011) Deposition and characterization of Zr-based multi component nanocomposite coatings for tribological applications**

K. Moon\*, D. Jung, J. Sun, S. Shin, Korea Institute of Industrial Technology, Republic of Korea

**(ICACC-S7-P120-2011) The properties of nanocomposite Al-X-Y-N (X= Ti, Cr, Zr), (Y= Cu, Si, Ni, B) coating synthesized by magnetron sputtering process with single alloying targets**

K. Moon\*, W. Lee, C. Byun, Korea Institute of Industrial Technology, Republic of Korea; K. Lee, Hanyang University, Republic of Korea

**(ICACC-S7-P121-2011) Design and Construction of Complex Nanostructured Al<sub>2</sub>O<sub>3</sub> Coating for Productive Applications**

P. Manivasakan\*, V. Rajendran, K. S. Rangasamy College of Technology, India; P. R. Rauta, B. B. Sahu, B. K. Panda, Dalmia Institute of Scientific and Industrial Research, India

**(ICACC-S7-P122-2011) TiO<sub>2</sub> Nanoparticle Array Patterning by Freeze Casting**

K. Lu\*, Z. Tian, B. Chen, Virginia Polytechnic Institute and State University, USA

**(ICACC-S7-P123-2011) Preparation of Silica Nanotubes using CNT-Silatrane Hybrid Material as Precursor**

M. Krissanasaeraneer\*, S. Wongkasemjit, Chulalongkorn University, Thailand; A. Cheetham, D. Eder, The University of Cambridge, United Kingdom

**(ICACC-S7-P124-2011) Investigation into the Nucleation and Growth of Boron Nitride Nanotubes Utilizing Metal Oxide Catalysts**

T. L. Miracle\*, Ohio Aerospace Institute, USA; J. B. Hurst, C. Hung, NASA GRC, USA

**(ICACC-S7-P125-2011) Synthesis of Nitrogen-doped Carbon Nanotubes Cups Using Two Stage Furnace**

L. F. Mabena\*, S. Sinha Ray, Council for Scientific and Industrial Research, South Africa; N. Coville, University of the Witwatersrand, South Africa

**(ICACC-S7-P126-2011) Visible Light Sensitized CdS@TiO<sub>2</sub> Nanorod Arrays Grown on FTO and Their Application as Photocatalyst**

J. Li, M. Hoffmann, L. Xiao, X. Song, University of Cologne, Germany; J. Prades, T. Andreu, F. Hernandez, Departament of Electronics, Spain; H. Shen, S. Mathur\*, University of Cologne, Germany

**(ICACC-S7-P127-2011) Enhancement of the near-band edge emission from ZnO nanowires by SnO<sub>2</sub> coating**

C. Lee\*, C. Jin, Inha University, Republic of Korea

**(ICACC-S7-P128-2011) The Comparison in the Efficiency of Nitrogen-doped and Undoped Carbon Nanotubes in the Anchoring of Silver Nanoparticles**

K. Mphahlele\*, S. Sinha Ray, Council for Scientific and Industrial Research, South Africa; S. D. Mhlanga, University of the Witwatersrand, South Africa

**(ICACC-S7-P129-2011) Micro-CVD on Multifunctional Substrates**

T. Fischer, S. Mathur\*, University of Cologne, Germany; A. Hackner, EADS Deutschland GmbH, Germany; G. Mueller, EADS Deutschland GmbH, Germany

**(ICACC-S7-P130-2011) Nanomaterials Based Devices by Ink-Jet Printing**

D. Zopes, F. Heinrich, R. von Hagen, R. Mueller, S. Mathur\*, University of Cologne, Germany

**(ICACC-S7-P131-2011) The crystallization behavior of  $\beta$ -cristobalite gel synthesized by sol-gel route**

O. San\*, M. Koc, Dumlupinar University, Turkey

**(ICACC-S7-P132-2011) Synthesis of nano-size  $\text{CaB}_6$  powders using various boron sources**

A. Akkoyunlu\*, R. Koc, Southern Illinois University Carbondale, USA; J. Mawdsley, C. David, Argonne National Laboratory, USA

**(ICACC-S7-P133-2011) Synthesis and characterization of nanocrystalline  $\text{TiO}_2$  powders by a novel combustion synthesis method**

A. Sedghi\*, Imam Khomieni International University, Islamic Republic of Iran; N. Riahi noori, Imam Khomieni International University, Islamic Republic of Iran; S. Baghshahi, Imam Khomieni International University, Islamic Republic of Iran; M. Barkhordari, Imam Khomieni International University, Islamic Republic of Iran

**(ICACC-S7-P134-2011) Physical-Chemical, Mechanical, Thermal, and Radiation Resistance of Hard and Super-Hard Nano-Structured Coatings**

A. D. Pogrebnyak\*, Sumy Institute for Surface Modification, Ukraine; M. Tashmetov, Institute of Nuclear Physics, NAS of Uzbekistan, Uzbekistan; M. Il'yashenko, Sumy State University, Ukraine; N. Makhmudov, Samarkand Branch of Tashkent State University of Information, Uzbekistan; V. Beresnev, Kharkov National University, Ukraine; O. Borysenko, I. Kulik, M. Kaverin, I. Yakuschenko, Sumy State University, Ukraine; J. Partyka, Lublin University of Technology, Poland; B. Postolnyi, Sumy State University, Ukraine

**(ICACC-S7-P135-2011) Multilayered Micro and - Nanocomposite Coatings Ti-N-Al/Ti-N/ $\text{Al}_2\text{O}_3$ /substrate, Their Structure and Properties**

A. D. Pogrebnyak\*, Belarus State University, Belarus; V. M. Beresnev, Kharkov National University, Ukraine; M. V. Il'yashenko, Belgorod State University, Russia, Russian Federation; D. V. Kolesnikov, Belarus State University, Belarus; A. P. Sypylenko, University of Technology, Poland; M. A. Kaverin, Sumy State University, Ukraine; N. K. Erdybaeva, University of Technology, Poland; P. V. Zukojski, Kharkov National University, Ukraine; F. F. Komarov, Belarus State University, Belarus; V. V. Drudnitskii, Kharkov National University, Ukraine

**(ICACC-S7-P136-2011) Preparation and Characterization of  $\text{LiMn}_2\text{O}_4$  Ion-sieve with High  $\text{Li}^+$  Adsorption Rate by Ultrasonic Spray Pyrolysis**

C. -. Ozgur\*, Dumlupinar University, Turkey

**(ICACC-S8-P137-2011) Observation of Crack Propagation Behavior of  $\text{Si}_3\text{N}_4$  ceramics by Scanning Probe Microscopy**

J. Tatami\*, O. Masahiro, T. Wakihara, K. Komeya, T. Meguro, Yokohama National University, Japan

**(ICACC-S8-P138-2011) Synthesis and characterization of lithium aluminate red phosphor**

Y. Amano\*, Nagoya Institute of Technology, Japan; K. Inoue, Mie Industrial Research Institute, Japan; S. Honda, S. Hashimoto, Y. Iwamoto, Nagoya Institute of Technology, Japan

**(ICACC-S8-P139-2011) Machinability Evaluation in the Ultrasonic Drilling (USD) Process of Aluminum Oxide-Based Ceramics**

R. S. Jadoun\*, GBPUAT, Pantnagar, India

**(ICACC-S8-P140-2011) Patterning Thick Film by Sand Blasting for High Resolution in Display Devices**

S. Hwang\*, J. Kim, H. Jeong, J. Jeon, Inha University, Republic of Korea; H. Shin, Samsung Mobile Display Co. Ltd., Republic of Korea; H. Kim, Inha University, Republic of Korea

**(ICACC-S8-P141-2011)  $\text{Er}_2\text{O}_3$ - $\text{BaTiO}_3$ -Ceramics Microstructure Fractal Analysis**

V. Mitic\*, V. Paunovic, J. Purenovic, J. Nedin, University of Nis, Serbia; V. Pavlovic, Serbian Academy of Sciences and Arts, Serbia; B. Jordovic, 2University of Kragujevac, Serbia; M. Miljkovic, University of Nis, Serbia

**(ICACC-S8-P142-2011) Thermal and Electrical Conductivity of  $\text{AlN}$  Ceramics with Low Temperature Sintering**

J. T. Lee\*, H. Lee, D. Kim, KAIST, Republic of Korea

**(ICACC-S8-P143-2011) Synthesis and Characterization of Si-Y-O-N phosphors**

T. Ishii\*, Nagoya Institute of Technology, Japan; Y. Zhou, K. Hirao, National Institute of Advanced Industrial Science and Technology, Japan; S. Honda, Y. Iwamoto, Nagoya Institute of Technology, Japan

**(ICACC-S8-P144-2011) Microporous polymer-derived organoamino group-functionalized amorphous silica membranes for carbon dioxide separation**

K. Sekimoto\*, S. Honda, Y. Iwamoto, Nagoya Institute of Tech., Japan

**(ICACC-S8-P145-2011) Synthetic study of ceramic-based insulating thin film on a metal substrate**

Y. Takeuchi\*, S. Honda, Nagoya Institute of Technology, Japan; H. Usami, Meijo University, Japan; Y. Iwamoto, Nagoya Institute of Technology, Japan

**(ICACC-S10-P146-2011) Graphite Foams – Addressing Technology Challenges**

A. L. Gyekenyesi\*, M. Singh, C. Smith, Ohio Aerospace Institute, USA; P. Stansberry, GrafTech International Holdings, Inc., USA; K. Alam, Ohio University, USA; D. Vrable, TMMT, Inc., USA

**(ICACC-S12-P147-2011) Diffraction study of self-recovery in decomposed  $\text{Al}_2\text{TiO}_5$  during annealing in vacuum**

I. Low\*, Curtin University of Technology, Australia; E. Wu, Institute of Metal Research, China

**(ICACC-S12-P148-2011) Oxidation Resistance of  $\text{ZrB}_2$ - $\text{SiC}$ : WC-NbC and WC-TaC Additions**

E. W. Neuman\*, W. Fahrenholtz, G. Hilmas, Missouri University of Science and Technology, USA

**(ICACC-S12-P149-2011) Diffusion Bonding between  $\text{Ti}_3\text{SiC}_2$  and NiTi Shape Memory Alloy**

S. Basu\*, F. Ozaydin, M. Radovic, I. Karaman, Texas A&amp;M University, USA

**(ICACC-S12-P150-2011) Effects of atmosphere on the pressureless sintering behavior of  $\text{ZrB}_2$  ceramics**

A. Els\*, H. Brown-Shaklee, G. Hilmas, W. Fahrenholtz, Missouri University of Science &amp; Technology, USA

**(ICACC-S12-P151-2011) Pressureless Sintering And Hot-Pressing Of  $\text{Ti}_2\text{AlN}$  Powders Obtained By SHS Process**

L. Chlubny\*, J. Lis, M. M. Bucko, AGH-University of Science and Technology, Poland

**(ICACC-S12-P152-2011) On the diffusivity and reactivity in  $\text{Ti}_2\text{AlC}$  - Ti system at 800-1400°C temperature range**

E. Ormond\*, S. Basu, K. Drideger, I. Karaman, M. Radovic, Texas A&amp;M University, USA

**(ICACC-S12-P153-2011) Effect of Heating Rate on the Densification of  $\text{ZrB}_2$** 

M. Thompson\*, W. G. Fahrenholtz, G. Hilmas, Missouri University of Science and Technology, USA

**(ICACC-S12-P154-2011) Solid solution effects on thermal and mechanical properties of metal-diborides toughened with  $\text{SiC}$** 

B. J. Lai\*, J. Watts, G. Hilmas, W. G. Fahrenholtz, Missouri University of Science and Technology, USA

## Thursday, January 27, 2011

**S1: Mechanical Behavior and Performance of Ceramics & Composites****Processing-Microstructure-Properties Correlations I**

Room: Coquina Salon A

Session Chairs: Yu Zhou, Harbin Institute of Technology; Guo-Jun Zhang, Shanghai Institute of Ceramics

**8:00 AM****(ICACC-S1-053-2011) Processing, Microstructure and Properties of C/C-SiC Composites Containing  $\text{Ti}_3\text{SiC}_2$  (Invited)**

X. Yin\*, L. Zhang, L. Cheng, National Key Laboratory of Thermostructure Composite Materials, China

**8:30 AM****(ICACC-S1-054-2011) Innovative multi-stage spark plasma sintering to obtain strong and tough ultrafine grained ceramics**

B. Basu\*, Indian Institute of Technology, Kanpur, India; M. Reddy, A. Mukhopadhyay, N. Kumar, D. Jain, IIT Kanpur, India

**8:50 AM****(ICACC-S1-055-2011) Densification and Characterization of Boron Carbide Nanopowders through Field Assisted Sintering (FAST)**

L. R. Vargas-Gonzalez\*, U.S. Army Research Laboratory, USA; C. D. Haines, D. Martin, U.S. Army ARDEC, USA; C. Hung, N. R. Vanier, PPG Industries, Inc., USA

**9:10 AM****(ICACC-S1-056-2011) Pressureless sintering of titanium diboride using metallic additives**

H. Heidari\*, Université Laval, Canada; H. D. Alamdari, Université Laval, Canada, D. Dubé, Université Laval, Canada; R. Schulz, Institut de Recherche d'Hydro-Québec, Canada

**9:30 AM****Break****9:50 AM****(ICACC-S1-057-2011) Thermal Stability and Effect of Texture on Ultrahigh Damping of Nanocrystalline Mg-Matrix Composites Reinforced with MAX Phases**

S. Amini, University of California Santa Barbara, USA; M. W. Barsoum, B. Anasori\*, Drexel University, USA

**10:10 AM****(ICACC-S1-058-2011) Development of Glass Ceramic Proppants for Hydrofracturing in Oil and Natural Gas Bearing Shales**

D. Hartwich\*, P. J. McClure, R. P. Koseski, B. E. Scheetz, J. R. Hellmann, The Pennsylvania State University, USA

**10:30 AM****(ICACC-S1-059-2011) Silicon carbide based sandwich structures: processing and properties**

A. Ortona\*, S. Pusterla, SUPSI-ICIMSI, Switzerland; S. Gianella, Erbicol, Switzerland; C. D'Angelo, SUPSI-ICIMSI, Switzerland

**10:50 AM****(ICACC-S1-060-2011) Sintering behaviour of lithium-titanate pebbles Modifications of pore morphology and pore size distribution**

D. Mandal\*, M. R. K. Shenoj, Bhabha Atomic Research Centre, India; D. Sen, S. Mazumder, D. Sathiyamoorthy, Bhabha Atomic Research Centre, Trombay, India; D. V. Khakkar, Indian Institute of Technology, Bombay, India

**11:10 AM****(ICACC-S1-061-2011) Effect of heat treatment on Thermal properties of Pitch-based and PAN-based Carbon-Carbon Composites**

S. S. Iqbal\*, Southern Illinois Univ, Carbondale, USA

**11:30 AM****(ICACC-S1-062-2011) Processing, sintering behavior and mechanical properties of phlogopite based glass-ceramic/PSZ zirconia composites**

Z. Hamnabard\*, Nuclear Science & Technology Research Institute (NSTIR), Islamic Republic of Iran; B. Eftekhari yekta, Nuclear Science & Technology Research Institute (NSTIR), Islamic Republic of Iran

**11:50 AM****(ICACC-S1-063-2011) Strengthening and toughening of Al<sub>2</sub>O<sub>3</sub>-13wt.%TiO<sub>2</sub> coatings fabricated by plasma spraying and laser remelting on titanium alloy**

C. Li\*, Shanghai University of Engineering Science, China; Y. Wang, Harbin Institute of Technology, China; Z. Yu, Shanghai University of Engineering Science, China; W. Tian, Y. Yang, Harbin Institute of Technology, China

**S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications****Advanced Coating Processing and Nanostructured Coating Systems**

Room: Coquina Salon G

Session Chairs: Rainer Gadow, IFKB University of Stuttgart; Yutaka Kagawa, The University of Tokyo

**8:00 AM****(ICACC-S2-051-2011) Advanced Ceramic Coatings: from "Passive" to "Engineered" Layers and from Micrometer-Sized to Nanometer-Sized Structural Scale (Invited)**

G. Montavon\*, University of Technology of Belfort-Montbéliard, France

**8:30 AM****(ICACC-S2-052-2011) Innovative plasma spray technology for advanced coatings (Invited)**

T. Yoshida\*, University of Tokyo, Japan

**9:00 AM****(ICACC-S2-053-2011) Microstructural evolution of AlN coatings in room temperature vacuum cold spraying**

C. Park\*, K. Baik, Chungnam National University, Republic of Korea

**9:20 AM****(ICACC-S2-054-2011) Graded Ceramic Coatings with Nanostructured Surface Layer**

T. Chraska\*, K. Neufuss, Inst. of Plasma Physics ASCR, Czech Republic

**9:40 AM****Break****10:00 AM****(ICACC-S2-055-2011) Advanced thermal spraying for oxide ceramic coatings as enabling technologies in product engineering (Invited)**

R. Gadow\*, A. Killinger, IFKB University of Stuttgart, Germany

**10:30 AM****(ICACC-S2-056-2011) High velocity suspension flame spraying (HVSFS) deposition of innovative bioactive glass coatings (Invited)**

V. Cannillo\*, G. Bolelli, University of Modena and Reggio Emilia, Italy; R. Gadow, A. Killinger, Universität Stuttgart, Germany; L. Lusvardi, A. Sola, University of Modena and Reggio Emilia, Italy; N. Stiegler, Universität Stuttgart, Germany

**11:00 AM****(ICACC-S2-057-2011) High velocity suspension flame sprayed (HVSFS) hydroxyapatite coatings for biomedical applications (Invited)**

N. Stiegler\*, R. Gadow, A. Killinger, IFKB University of Stuttgart, Germany

**11:30 AM****(ICACC-S2-058-2011) Ceramics coating by plasma spraying : control online, new developments and challenges for structured coatings (Invited)**

A. Denoirjean\*, P. Fauchais, SPCTS / CNRS, France

**S3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology****Electrolysis**

Room: Coquina Salon E

Session Chairs: Teruhisa Horita, AIST; Alexander Michaelis, Fraunhofer Institute

**8:00 AM****(ICACC-S3-050-2011) Water Electrolysis at High Temperature (Invited)**

M. Zahid, J. Schefold, A. Brisse, Q. Fu\*, European Institute for Energy Research, Germany

**8:30 AM****(ICACC-S3-051-2011) High Temperature CO<sub>2</sub> Electrolysis using ODF Catalysts**

H. Guo, G. Iqbal, B. Kang\*, West Virginia University, USA; A. Manivannan, National Energy Technology Laboratory (NETL), USA

**8:50 AM****(ICACC-S3-052-2011) Improving Long term stability of solid oxide electrolysis cells**

S. Elangovan\*, J. Hartvigsen, D. Larsen, F. Zhao, I. Bay, Ceramtec, Inc., USA

**9:10 AM****(ICACC-S3-054-2011) Observations on the Anode-Electrolyte Interface Stability in Solid Oxide Electrolysis Cells (SOEC)**

M. Keane\*, A. Verma, P. Singh, University of Connecticut, USA

9:30 AM

Break

## Surface/Interfacial Reactions

Room: Coquina Salon E

Session Chairs: Alexander Michaelis, Fraunhofer Institute; Teruhisa Horita, AIST

10:00 AM

### (ICACC-S3-055-2011) Imaging of Oxygen Ionization and Diffusion in Flatten Tube Stacks

T. Horita\*, T. Shimonosono, H. Kishimoto, K. Yamaji, M. E. Brito, AIST, Japan; H. Yokokawa, Tokyo City University, Japan

10:20 AM

### (ICACC-S3-056-2011) The influence of impurities in air on SOFC cathode degradation

I. M. Torres da Silva\*, J. Hjelm, M. Mogensen, Risø DTU, Denmark

10:40 AM

### (ICACC-S3-057-2011) Cathode Microstructure and Composition Effect on Interaction with Interconnect in Solid Oxide Fuel Cells

K. Lu\*, T. Jin, Virginia Polytechnic Institute and State University, USA

11:00 AM

### (ICACC-S3-058-2011) In-situ Investigation of Structural and Electrochemical Degradation of SOFC Anode Exposed to PH<sub>3</sub>

H. Guo, G. Iqbal, B. Kang\*, West Virginia University, USA

11:20 AM

### (ICACC-S3-059-2011) Oxygen transport properties of La<sub>0.6</sub>Sr<sub>0.4</sub>Co<sub>0.2</sub>Fe<sub>0.8</sub>O<sub>3-δ</sub>

Y. Li\*, West Virginia University, USA; K. Gerdes, National Energy Technology Laboratory, USA; X. Liu, West Virginia University, USA

11:40 AM

### (ICACC-S3-060-2011) A Comparative Assessment of Chromia and Alumina Forming Alloys for SOFC Balance of Plant Applications

S. Bhowmick\*, G. Le, A. Verma, P. Singh, University of Connecticut, USA

## S5: Next Generation Bioceramics

### In Vitro and In Vivo Characterization of Bioceramics

Room: Ponce de Leon

Session Chair: Jay Hanan, Oklahoma State University

8:00 AM

### (ICACC-S5-013-2011) Tough, strong and stable zirconia based ceramics for orthopaedic and dental applications : past issues, current state and future trends (Invited)

J. Chevalier\*, L. Gremillard, INSA-Lyon, France

8:30 AM

### (ICACC-S5-014-2011) Biomimetic Mineralization of Bone Tissue Engineering Scaffolds (Invited)

P. X. Ma\*, University of Michigan, USA

9:00 AM

### (ICACC-S5-015-2011) Selective Laser Sintered Ca-P/PHBV Nanocomposite Scaffolds with Sustained Release of rhBMP-2 for Bone Tissue Engineering

B. Duan, M. Wang\*, The University of Hong Kong, Hong Kong

9:20 AM

### (ICACC-S5-016-2011) Methods of Evaluating Bioactive Orthopedic Implants (Invited)

T. D. McGee\*, Iowa State University, USA

9:50 AM

Break

10:10 AM

### (ICACC-S5-017-2011) Substituted Apatites: New Perspectives by Computer Modelling and Ab Initio NMR Calculations (Invited)

C. Bonhomme\*, F. Babonneau, C. Gervais, universite P et M Curie, France; D. Laurencin, ICG, France; M. E. Smith, J. V. Hanna, University of Warwick, United Kingdom; A. Osaka, S. Hayakawa, Laboratory of Biomaterials, Japan

10:40 AM

### (ICACC-S5-018-2011) Comparison of Bone Growth on Scaffolds Made From Silicate, Borosilicate, and Borate Glasses (Invited)

D. E. Day\*, Missouri University of Science and Technology, USA; L. Bonewald, University of Missouri - Kansas City, USA; S. B. Jung, Missouri University of Science and Technology, USA; L. Bi, University of Missouri - Kansas City, USA

11:10 AM

### (ICACC-S5-019-2011) "In-vivo" Ageing of Dental Zirconia Ceramics: 12-months Results (Invited)

T. Kosmac\*, Jozef Stefan Institute, Slovenia; P. Jevnikar, Medical Faculty, University of Ljubljana, Slovenia; A. Kocjan, Jozef Stefan Institute, Slovenia

11:40 AM

### (ICACC-S5-020-2011) Tissue In-Growth in Resorbable Porous Tissue Scaffolds

J. J. Liu, A. Wallen\*, K. Patel, R. Dahl, Bio2 Technologies, USA; C. Kearney, M. Spector, VA Boston Healthcare System, USA

## S7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications

### Industrial Development and Application of Nanomaterials

Room: Coquina Salon C

Session Chairs: Sanjay Mathur, University of Cologne; Hao Shen, University of Cologne

8:00 AM

### (ICACC-S7-039-2011) Fabrication and characterization of Ni/Cu/YSZ cermet for high temperature electrolysis cathode prepared by mechanical alloying

H. Hong\*, J. Kim, S. Lee, Institute for Advanced Engineering, Republic of Korea

8:20 AM

### (ICACC-S7-040-2011) Influence of amorphous nano additive on sintering behavior and electrical properties of BaTiO<sub>3</sub> ceramics

S. Sohn\*, H. Kim, M. Hong, S. Kwon, K. Hur, Samsung electro-mechanics co., Ltd., Republic of Korea

8:40 AM

### (ICACC-S7-041-2011) Development of an Aqueous Synthesis Route for Nano-crystalline PLZT

M. R. Winter\*, C. B. DiAntonio, T. Monson, A. W. Roesler, D. L. Huber, T. P. Chavez, T. E. Stevens, Sandia National Laboratories, USA

9:00 AM

### (ICACC-S7-042-2011) Combustion Chemical Vapor Deposition of Ceramic Cathode Electrodes

E. Koep, IREC, Catalonia Institute for Energy Research, Spain; J. R. Morante\*, University of Barcelona, Spain

9:20 AM

### (ICACC-S7-043-2011) Characterization of Thermal Properties of Cordierite Ceramics Prepared by Using Spherical Shaped and Hollow Particles

C. -. Ozgur\*, Dumlupinar University, Turkey

**9:40 AM**

**Break**

**10:00 AM**

**(ICACC-S7-044-2011) Technological Development for a Next-generation Highly-reliable Gas Sensor (Invited)**

F. Hernandez-Ramirez, IREC, Catalonia Institute for Energy Research, Spain; J. R. Morante\*, University of Barcelona, Spain

**10:30 AM**

**(ICACC-S7-045-2011) Carbide-metal composites, gradients and coatings through solution processing (Invited)**

G. Westin\*, Uppsala University, Sweden; K. Jansson, Department of Materials and Environmental Chemistry, Sweden

**11:00 AM**

**(ICACC-S7-046-2011) Production of silica nanoparticle with the controlled size and shape from the microemulsion solution (Invited)**

T. Hwang\*, Korea Institute of Industrial Technology, Republic of Korea

**11:30 AM**

**(ICACC-S7-047-2011) Nanomaterials: Research, Development and Technology Roadmaps - 2020 (Invited)**

M. H. Van de Voorde\*, Technische Universiteit Delft, Netherlands

**S8: 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT) in honor of Professor Katsutoshi Komeya**

**Design-Oriented Manufacturing III**

Room: Coquina Salon B

Session Chairs: Vojislav Mitic, University of Nis; Guo-Jun Zhang, Shanghai Institute of Ceramics

**8:30 AM**

**(ICACC-S8-050-2011) Reactive Hot Pressing and Microstructure Tailoring of Group IVB Metal Diboride Ceramic Composites (Invited)**

G. Zhang\*, Shanghai Institute of Ceramics, China

**9:00 AM**

**(ICACC-S8-051-2011) Mechanical Properties of Chemical Bonded Phosphate Ceramics with Fly Ash as Filler**

H. A. Colorado\*, C. Hiel, T. Hahn, J. Yang, UCLA, USA

**9:20 AM**

**(ICACC-S8-052-2011) Effect of TiO<sub>2</sub> addition on thermal and mechanical properties of Y-Si-Al-O-N glasses**

T. Wakiyama\*, J. Tatami, K. Komeya, T. Meguro, Yokohama National University, Japan; A. Kidari, S. Hampshire, M. J. Pomeroy, University of Limerick, Ireland

**9:40 AM**

**Break**

**10:00 AM**

**(ICACC-S8-053-2011) BaTiO<sub>3</sub>-Ceramics Doped by Rare Earth Additives Intergranular Microelectronics Properties Structural Fractal Analysis (Invited)**

V. Mitic\*, L. Kocic, V. Paunovic, University of Nis, Serbia; A. Terzic, Institute for Technology of Nuclear and Other Raw Mineral Materials, Serbia; V. Pavlovic, Serbian Academy of Sciences and Arts, Serbia; P. Petkovic, University of Nis, Serbia

**10:20 AM**

**(ICACC-S8-054-2011) Ceramics Micro Processing of Photonic Crystals and Amorphous**

S. Kirihara\*, T. Niki, N. Ohta, S. Tasaki, Osaka University, Japan

**10:40 AM**

**(ICACC-S8-055-2011) Development of Numerical Method for Evaluating Microstructural Fracture in Smart Materials**

H. Serizawa\*, S. Tomiyama, T. Hajima, H. Murakawa, Osaka University, Japan

**11:00 AM**

**(ICACC-S8-056-2011) Mechanical Property Improvements of Ceramic Dental Crowns Modelled by Using Laser Scanning Stereolithography and Powder Sintering Processes**

S. Tasaki\*, S. Kirihara, T. Soumura, Osaka University, Japan

**11:20 AM**

**(ICACC-S8-057-2011) Influence of process parameters on microstructure and mechanical properties of friction stir welded aluminum-magnesium alloy**

K. S. Sandhu\*, Baba Farid College of Engineering and Technology, India; S. S. Chatha, H. Singh, Yadavindra College of Engineering, India

**S10: Thermal Management Materials and Technologies**

**Advanced Materials and Design for Thermal Management**

Room: Coquina Salon F

Session Chairs: Andrew Gyekenyesi, Ohio Aerospace Institute; Mrityunjay Singh, Ohio Aerospace Institute

**8:40 AM**

**(ICACC-S10-009-2011) Microstructural and Mechanical Characterization of Brazed Titanium-to-Graphite Foam Joints for Thermal Management Applications**

M. Singh\*, Ohio Aerospace Institute, USA; R. Asthana, University of Wisconsin-Stout, USA; A. L. Gyekenyesi, C. E. Smith, Ohio Aerospace Institute, USA

**9:00 AM**

**(ICACC-S10-010-2011) Tensile and Compressive Properties of Graphite Foam for Thermal Management**

C. Smith\*, A. Gyekenyesi, J. Bail, M. Singh, Ohio Aerospace Institute, USA

**9:20 AM**

**(ICACC-S10-011-2011) Engineered Versus Natural Thermal Transfer and Thermal Management Media – Using Science to Improve Upon Nature**

T. Szymanski\*, J. Reid, D. Sherman, Saint-Gobain NorPro, USA

**9:40 AM**

**Break**

**10:00 AM**

**(ICACC-S10-012-2011) Impact of Oxidation on thermal properties of heat treated 2D pitch-based and 3D PAN-based carbon-carbon composites**

S. S. Iqbal\*, Southern Illinois Univ, Carbondale, USA

**10:20 AM**

**(ICACC-S10-013-2011) Hybrid ceramic-metal tubes for steam pipes**

C. Spatz\*, Fraunhofer ISC, Germany; C. S. Modén, University Bayreuth, Germany; W. Krenkel, Fraunhofer ISC, Germany

**10:40 AM**

**(ICACC-S10-014-2011) Oxide Materials with Exceptionally Low Thermal Conductivity: Natural Superlattices and Structural Complexity**

D. R. Clarke\*, T. D. Sparks, Harvard University, USA

## S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

### Oxidation Behavior

Room: Coquina Salon H

Session Chairs: William Fahrenholtz, Missouri University of Science and Technology; Guo-Jun Zhang, Shanghai Institute of Ceramics

8:00 AM

#### (ICACC-S12-018-2011) Modeling Oxidation Kinetics of UHTCs (Invited)

T. Parthasarathy\*, Air Force Research Laboratory, USA; R. A. Rapp, The Ohio State University, USA; M. Opeka, Naval Surface Warfare Center, USA; M. K. Cinibulk, Air Force Research Laboratory, USA

8:30 AM

#### (ICACC-S12-019-2011) Oxidation studies of ZrB<sub>2</sub> and ZrB<sub>2</sub>-SiC composites using HTXRD

P. Sarin\*, P. E. Driemeyer, R. P. Haggerty, D. Kim, J. L. Bell, Z. D. Apostolov, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

8:50 AM

#### (ICACC-S12-020-2011) Phase Stability and Initial Oxidation at 500 °C of Ti<sub>2</sub>AlC Thin Films (Invited)

J. Frodelius, P. Eklund\*, L. Hultman, Linköping University, Sweden

9:20 AM

#### (ICACC-S12-021-2011) UHTC Sol Gel Coatings to Improve the High-Temperature Oxidation Resistance of Carbon Preforms

S. Venugopal\*, B. Vaidhyanathan, J. Binner, Loughborough university, United Kingdom; A. Heaton, P. Brown, Defense science and research laboratories, United Kingdom

9:40 AM

Break

### Mechanical Properties

Room: Coquina Salon H

Session Chairs: Sylvia Johnson, NASA Ames Research Center; T. Parthasarathy, UES, Inc.

10:00 AM

#### (ICACC-S12-022-2011) High Temperature Tensile Test Rig for High Resolution in-situ Synchrotron X-ray micro-tomography of Woven Ceramic Matrix Composites

H. Bale\*, University of California, Berkeley, USA; J. Nasiatka, A. MacDowell, Lawrence Berkeley National Laboratory, USA; B. Cox, Teledyne Scientific Co. LLC, USA; R. Ritchie, University of California, Berkeley, USA

10:20 AM

#### (ICACC-S12-023-2011) Evaluation of mechanical properties of ultra-high temperature ceramics (UHTCs)

E. Zapata Solvas\*, D. D. Jayaseelan, Imperial College London, United Kingdom; E. Sanchez Gonzalez, Universidad de Extremadura, Spain; H. Lin, Oak Ridge National Laboratory, USA; P. Brown, DSTL, United Kingdom; W. E. Lee, Imperial College London, United Kingdom

10:40 AM

#### (ICACC-S12-024-2011) Temperature and strain-rate dependent plasticity of ZrB<sub>2</sub> composites from hardness measurements

J. Wang\*, F. Giuliani, L. J. Vandeperre, Imperial College London, United Kingdom

11:00 AM

#### (ICACC-S12-025-2011) Effect of Carbon Additions on the Thermal and Mechanical Properties of Hot Pressed ZrB<sub>2</sub>

G. Harrington\*, G. Hilmas, W. Fahrenholtz, Missouri S&T, USA

11:20 AM

#### (ICACC-S12-026-2011) Damping, High Temperature Neutron Diffraction and Rietveld Analysis of Select MAX Phases

N. J. Lane\*, Drexel University, USA; S. C. Vogel, Los Alamos National Laboratory, USA; M. Radovic, Texas A & M University, USA; M. W. Barsoum, Drexel University, USA

11:40 AM

#### (ICACC-S12-027-2011) High-Temperature Testing and Characterisation of UHTC Composites

A. Paul\*, J. Binner, B. Vaidhyanathan, Loughborough University, United Kingdom; A. Heaton, P. Brown, DSTL, United Kingdom

## S13: Advanced Ceramics and Composites for Nuclear Fusion Applications

### Irradiation Effects on Advanced Ceramics and Composites I

Room: Oceanview

Session Chair: Lance Snead, Oak Ridge National Laboratory

8:00 AM

#### (ICACC-S13-038-2011) Irradiation Effects in Nanocrystalline SiC (Invited)

W. J. Weber\*, University of Tennessee, USA; F. Gao, W. Jiang, Pacific Northwest National Laboratory, USA; Y. Zhang, Oak Ridge National Laboratory, USA

8:30 AM

#### (ICACC-S13-039-2011) Size effects in the radiation response of silicon carbide

N. Swaminathan, D. Morgan, I. Szlufarska\*, University of Wisconsin - Madison, USA

8:50 AM

#### (ICACC-S13-040-2011) Irradiation Response of Nanocrystalline Cubic Ceria and Zirconia

Y. Zhang\*, Oak Ridge National Laboratory, USA; P. D. Edmondson, University of Tennessee, USA; S. Moll, W. Jiang, T. Varga, M. E. Bowden, Pacific Northwest National Laboratory, USA; F. Namavar, University of Nebraska Medical Center, USA; W. J. Weber, Oak Ridge National Laboratory, USA

9:10 AM

#### (ICACC-S13-041-2011) Irradiation effects on SiC/SiC composites

A. Michaux\*, C. Sauder, M. Auclair, B. Bourdilliau, CEA, France

9:30 AM

#### (ICACC-S13-042-2011) Irradiation creep of SiC during self-ion irradiation

S. Kondo\*, T. Koyanagi, T. Hinoki, Kyoto University, Japan

9:50 AM

Break

## Fuel Ceramics II and Irradiation Effects II

Room: Oceanview

Session Chair: Gerald Pintsuk, Forschungszentrum Juelich

10:10 AM

#### (ICACC-S13-043-2011) Mechanical Properties of SiC in high temperature reactor fuel particles

H. Zhang, E. Lopez-Honorato, P. Xiao\*, University of Manchester, United Kingdom

10:30 AM

#### (ICACC-S13-044-2011) Crush Testing of SiC Hemispheres in TRISO-Coated Fuel Particles

B. Hansford, I. Reimanis\*, R. Kirchhofer, B. Gorman, Colorado School of Mines, USA; D. Butt, Boise State University, USA

10:50 AM

#### (ICACC-S13-045-2011) Determination of Hoop Strength for Fuel Cladding of Ceramic Composite

K. Toyoshima\*, T. Hinoki, Kyoto University, Japan; F. Kano, S. Higuchi, Toshiba Corporation, Japan

11:10 AM

#### (ICACC-S13-046-2011) A comparison of helium effect on swelling between CVD and LPS SiC

T. Koyanagi\*, S. Kondo, T. Hinoki, Kyoto University, Japan

11:30 AM

**(ICACC-S13-047-2011) Radiation effect on advanced SiC/SiC composites in high temperature, high fluence conditions**  
Y. Katoh\*, L. L. Snead, Oak Ridge National Laboratory, USA; T. Nozawa, Japan Atomic Energy Agency, Japan; K. Ozawa, Oak Ridge National Laboratory, USA; T. Hinoki, Kyoto University, Japan

## FS2: Computational Design, Modeling, and Simulation of Ceramics and Composites

### Characterization of New Materials, Interfaces and Grain Boundaries at Atomic Scale

Room: Coquina Salon D

Session Chairs: Wai-Yim Ching, University of Missouri-Kansas City; Jingyang Wang, Institute of Metal Research

8:00 AM

**(ICACC-FS2-001-2011) Atomic-scale modelling of ceramic interfaces by aberration-corrected STEM and first principles calculations (Invited)**

N. Shibata\*, S. Findlay, T. Mizoguchi, The University of Tokyo, Japan; K. Matsunaga, Kyoto University, Japan; T. Yamamoto, Y. Ikuhara, The University of Tokyo, Japan

8:30 AM

**(ICACC-FS2-002-2011) Grain growth in perovskite ceramics (Invited)**

M. J. Hoffmann\*, M. Baeurer, M. Syha, D. Weygand, P. Gumbsch, KIT, Germany

9:00 AM

**(ICACC-FS2-003-2011) Development and application of interatomic potentials for ultra high temperature ceramics (UHTC): ZrB<sub>2</sub> and HfB<sub>2</sub>**

J. Lawson\*, NASA Ames Research Center, USA; M. S. Daw, Clemson University, USA; C. W. Bauschlicher, NASA Ames Research Center, USA

9:20 AM

**(ICACC-FS2-004-2011) Wear of Nanocrystalline Ceramics by Atomistic Simulations (Invited)**

I. Szlufarska\*, M. Mishra, University of Wisconsin, USA; Y. Mo, Massachusetts Institute of Technology, USA

9:40 AM

Break

10:00 AM

**(ICACC-FS2-005-2011) Simulation of friction and wear processes in carbon tribocontacts (Invited)**

P. Gumbsch\*, KIT, Germany; L. Pastewka, M. Moseler, Fraunhofer IWM, Germany; G. Moras, KIT, Germany

10:30 AM

**(ICACC-FS2-006-2011) Theoretical XANES/ELNES spectra of Si-K, Si-L, N-K, and O-K edges of an intergranular glassy film in a prismatic model of  $\beta$ -Si<sub>3</sub>N<sub>4</sub> (Invited)**

P. Rulis\*, W. Ching, University of Missouri - Kansas City, USA

11:00 AM

**(ICACC-FS2-007-2011) Kinetic Monte Carlo Simulation of Oxygen and Cation Diffusion in Yttria-Stabilized Zirconia (Invited)**

B. Good\*, NASA GRC, USA

11:30 AM

**(ICACC-FS2-008-2011) Computer Simulation of Radiation Effects in Ceramics and Composites (Invited)**

R. Devanathan\*, F. Gao, X. Sun, M. Khaleel, Pacific Northwest National Laboratory, USA

## S1: Mechanical Behavior and Performance of Ceramics & Composites

### Processing-Microstructure-Properties II

Room: Coquina Salon A

Session Chairs: Bikramjit Basu, IIT Kanpur; Wataru Nakao, Yokohama National University

1:30 PM

**(ICACC-S1-064-2011) Microstructure and mechanical properties of pressureless sintered and HIPed silicon nitride ceramics**

V. D. Krstic\*, Queen's University, Canada; A. Bellosi, F. Bucciotti, ISTECC-CNR, Institute for Science and Technology of Ceramics, Italy; Z. Krstic, Queen's University, Canada; V. Medri, ISTECC-CNR, Institute for Science and Technology of Ceramics, Italy

1:50 PM

**(ICACC-S1-065-2011) Grain Boundary Control for Si<sub>3</sub>N<sub>4</sub> Ceramics in the REO-MgO System**

Z. Nawaz, Ceradyne Inc, USA; J. J. Swab, Army Research Labs, USA; B. Mikijelj\*, Ceradyne Inc, USA

2:10 PM

**(ICACC-S1-066-2011) DFT Model Of The Interface Between  $\beta$ -Si<sub>3</sub>N<sub>4</sub> Grains And The Intergranular Glassy Film**

J. Synowczynski\*, J. A. Andzelm, J. J. Swab, Army Research Laboratory, USA

2:30 PM

**(ICACC-S1-067-2011) In-situ development of carbon nanotubes containing silicon nitride nanocomposites**

J. González-Julían\*, Institute of Ceramics and Glass (CSIC), Spain; A. Datye, The University of Tennessee, USA; K. Wu, Florida International University, USA; M. Belmonte, Institute of Ceramics and Glass (CSIC), Spain

2:50 PM

**(ICACC-S1-068-2011) The Effect of Sintering Techniques and Grain Size on the Mechanical and Optical Properties of Multiphase Ceramics**

C. Hoo\*, M. L. Mecartney, UC Irvine, USA

3:10 PM

Break

3:30 PM

**(ICACC-S1-069-2011) Potential use of crack-healing to improve thermal shock resistance of ceramic components**

W. Nakao\*, Yokohama National University, Japan

3:50 PM

**(ICACC-S1-070-2011) Characteristics of coarser defects, strength and weibull modulus in dry-pressed ceramics**

S. Tanaka\*, S. Goi, R. Furushima, K. Uematsu, Nagaoka University of Technology, Japan

4:10 PM

**(ICACC-S1-071-2011) Properties of SiC ceramics prepared using wood particle based polymer composites**

B. Muthiah\*, A. Ganesan, Indian Institute of Technology Madras, India; B. Prasad V.V., Defense Metallurgical Research Laboratory, India

4:30 PM

**(ICACC-S1-072-2011) Designing near-zero thermal expansion ceramic composites by using  $\beta$ -eucryptite**

A. Pelletant\*, INSA-Lyon, MATEIS CNRS UMR5510, France; L. Blanchard, Thales Alenia Space, France; J. Chevalier, G. Fantozzi, H. Reveron, INSA-Lyon, MATEIS CNRS UMR5510, France

4:50 PM

**(ICACC-S1-073-2011) High and low-energy activations of nano-zirconia based systems**

S. Kulkov\*, S. Buyakova, Institute of Strength Physics and Material Sciences RAS and Tomsk State University, Russian Federation

**5:10 PM**

**(ICACC-S1-074-2011) Pre-ceramic-polymer-bonded SiC performs for high volume fraction SiCp/Al composites**

K. Sujirote\*, K. Dateraksa, S. Ngembamrung, National Metal & Materials Technology Center, Thailand; R. McCuiston, King Mongkut's University of Technology Thonburi, Thailand; J. Wannasin, T. Sungkapun, Prince of Songkla University, Thailand

**5:30 PM**

**(ICACC-S1-075-2011) Pultrusion of chemically bonded phosphate ceramics composites**

H. A. Colorado\*, T. Hahn, C. Hiel, UCLA, USA

**5:50 PM**

**(ICACC-S1-076-2011) The Influence of Production Conditions and Resin Systems on the Mechanical Properties of Kenaf Fiber Reinforced Thermoset Composites**

R. Paskaramoorthy\*, University of the Witwatersrand, South Africa

**S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications**

**Multifunctional and Nanostructured Coating Systems**

Room: Coquina Salon G

Session Chairs: Jeffrey Eldridge, NASA Glenn Research Center; Eric Jordan, University of Connecticut

**1:30 PM**

**(ICACC-S2-059-2011) Damping Mechanisms in High Temperature Coatings (Invited)**

D. R. Clarke\*, A. Limarga, A. Shanian, Harvard University, USA

**2:00 PM**

**(ICACC-S2-060-2011) Atomic Layer Deposition of Nanostructured Ceramic Coatings (Invited)**

J. Elam\*, Argonne National Laboratory, USA

**2:30 PM**

**(ICACC-S2-061-2011) Recent Developments in the Properties and Applications of Ultra-Nanocrystalline Diamond and Tungsten Carbide/Amorphous Hydrocarbon Nanocomposite Coatings (Invited)**

G. L. Doll\*, The Timken Company, USA

**3:00 PM**

Break

**3:20 PM**

**(ICACC-S2-062-2011) SiC nanowire-toughened SiC oxidation protective coating for carbon/carbon composites**

Y. Chu, Q. Fu\*, H. Li, K. Li, Northwestern Polytechnical University, China

**3:40 PM**

**(ICACC-S2-063-2011) Finite element model characterization of nano-composite thermal and environmental barrier coatings**

Y. Yamada\*, Ohio Aerospace Institute, USA; D. Zhu, NASA Glenn Research Center, USA

**4:00 PM**

**(ICACC-S2-064-2011) Super Dense TiO<sub>2</sub> Films on Glass, FTO and Silicon Substrates Made by Dip Coating**

J. Prochazka\*, L. Kavan, M. Zukalova, JHI, Czech Republic; A. Poruba, Solartec, Inc., Czech Republic

**4:20 PM**

**(ICACC-S2-065-2011) Conductive ternary ceramic nanocomposite Ti-C-based coatings as novel electrical contact materials**

P. Eklund\*, L. Hultman, Linköping University, Sweden; U. Jansson, Uppsala University, Sweden

**4:40 PM**

**(ICACC-S2-066-2011) Effect of Thickness on Deformability and Fracture Behavior of Ultra-thin Al<sub>2</sub>O<sub>3</sub> Layer Coated on Ductile Material**

R. T. Doloksaribu\*, R. Kitazawa, Y. Kagawa, The University of Tokyo, Japan

**5:00 PM**

**(ICACC-S2-067-2011) Doped ZnO TCO Electrodes by Sol-Gel Deposition**

G. Grader\*, G. Shter, I. Winer, Technion-Israel Institute of Technology, Israel

**S3: 8th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology**

**Interconnects**

Room: Coquina Salon E

Session Chairs: Jeff Stevenson, Pacific Northwest National Laboratory; Ayyakkannu Manivannan, US DOE/NETL

**1:30 PM**

**(ICACC-S3-061-2011) CroFer 22 APU in real SOFC stacks (Invited)**

Q. Fang\*, M. Heinrich, C. Wunderlich, staxera GmbH, Germany

**2:00 PM**

**(ICACC-S3-062-2011) Effect of Metallic Interconnects Thickness on Its Long-Term Performance in SOFCs**

W. Liu\*, X. Sun, L. Stephens, M. Khaleel, PNNL, USA

**2:20 PM**

**(ICACC-S3-063-2011) Characterization of Complex Interfaces in Coated Metallic Interconnects**

N. Magdefrau\*, E. Sun, L. Chen, Y. John, United Technologies Research Center, USA; M. Aindow, University of Connecticut, USA

**2:40 PM**

**(ICACC-S3-064-2011) Effect of Chromium Doping on the Crystal Structure, Electrical Conductivity and Thermal Expansion of Manganese Cobalt Spinel Oxides**

Y. Liu\*, K. Wang, J. Fergus, Auburn University, USA

**3:00 PM**

Break

**3:20 PM**

**(ICACC-S3-065-2011) Optimized Spray MnCoO Spinel Coating for SOFC application with Design of Experiment Method**

J. Choi\*, J. W. Stevenson, M. Chou, Pacific Northwest National Laboratory, USA

**3:40 PM**

**(ICACC-S3-066-2011) LiF as sintering aid for Co<sub>2</sub>MnO<sub>4</sub> spinel used as protecting coating on stainless steel SOFC interconnectors**

A. L. Prette\*, V. M. Sglavo, University of Trento, Italy

**4:00 PM**

**(ICACC-S3-067-2011) Next Generation Protective coatings for SOFC Interconnects**

M. M. Seabaugh\*, M. G. Beachy, S. Ibanez, R. Kimbrell, M. J. Day, G. Arkenberg, NexTech Materials, Ltd., USA

**4:20 PM**

**(ICACC-S3-068-2011) Development of low cost protection coatings for SOFC interconnect applications**

G. Xia\*, X. Li, J. D. Templeton, Z. Nie, J. W. Stevenson, Pacific Northwest National Laboratory, USA

**4:40 PM**

**(ICACC-S3-069-2011) Effects of micro-defects on gas tightness and electrical conductivity of Ca-doped LaCr<sub>2</sub>O<sub>3</sub> coatings**

K. Baik\*, T. Jeong, C. Park, Chungnam National University, Republic of Korea

5:00 PM

**(ICACC-S3-070-2011) Cathode Contact Materials**  
M. C. Tucker\*, L. Cheng, L. C. DeJonghe, LBNL, USA

5:20 PM

**(ICACC-S3-071-2011) Development of Cathode/Interconnect Contact Materials at PNNL**  
G. Xia\*, Z. Lu, L. Shari, J. D. Templeton, Z. Nie, J. W. Stevenson, Pacific Northwest National Laboratory, USA

## S5: Next Generation Bioceramics

### Medical and Dental Applications of Bioceramics

Room: Ponce de Leon

Session Chair: Min Wang, The University of Hong Kong

1:30 PM

**(ICACC-S5-021-2011) Spark Plasma Sintering of HA-Ti composite: in Vitro biomineralization and cell culture (Invited)**  
A. Kumar, S. Dhara, K. Biswas, B. Basu\*, Indian Institute of Technology Kanpur, India

2:00 PM

**(ICACC-S5-022-2011) Microbeam X-ray grain averaged residual stress in dental ceramics (Invited)**  
H. Bale, University of California, USA; M. Allahkarami, Oklahoma State University, USA; N. Tamura, Advanced Light Source, USA; J. C. Hanan\*, Oklahoma State University, USA

2:20 PM

**(ICACC-S5-023-2011) Bioactive Glass Scaffolds for the Repair of Load-Bearing Bones (Invited)**  
M. N. Rahaman\*, Missouri University of Science and Technology, USA

2:40 PM

**(ICACC-S5-024-2011) In situ Manufacture of Ceramic Coatings: Biomimicry of Leaf Surfaces (Invited)**  
J. A. Nychka\*, J. E. Samad, University of Alberta, Canada

3:10 PM

Break

3:30 PM

**(ICACC-S5-025-2011) On the potential of chemically bonded ceramics as biomaterials (Invited)**  
L. A. Hermansson\*, Doxa AB, Sweden

3:50 PM

**(ICACC-S5-026-2011) Electrically Stimulated Enhancement of Cell Proliferation on Ferroelectric-Hydroxyapatite Composites**  
A. K. Dubey, S. D. Gupta, B. Basu\*, Indian Institute of Technology Kanpur, India

4:10 PM

**(ICACC-S5-027-2011) Do cell culture solutions transform brushite into octacalcium phosphate? (Invited)**  
I. Mert, S. Mandel, A. Tas\*, Yeditepe University, Turkey

4:30 PM

**(ICACC-S5-028-2011) Aging-free dental zirconia-based ceramics**  
N. A. Courtois\*, INSA-Lyon MATEIS UMR 5510, France; E. Apel, C. Ritzberger, Ivoclar Vivadent AG, Liechtenstein; H. Reveron, INSA-Lyon MATEIS UMR 5510, France; V. Rheinberger, Ivoclar Vivadent AG, Liechtenstein; J. Chevalier, INSA-Lyon MATEIS UMR 5510, France; W. Höland, Ivoclar Vivadent AG, Liechtenstein

4:50 PM

**(ICACC-S5-029-2011) Fractographic Analysis of Broken Ceramic Dental Restorations**  
G. Quinn\*, American dental association foundation, USA; K. Hoffman, American dental association foundation, USA

5:10 PM

**(ICACC-S5-004-2011) Improving Biocompatibility by Nanoscale modification (Invited)**  
F. Rosei\*, INRS, Canada

## S6: International Symposium on Ceramics for Electric Energy Generation, Storage, and Distribution

### Thermoelectric Materials for Energy Harvesting

Room: Coquina Salon B

Session Chairs: George Nolas, University of South Florida; Fivos Drymiotis, Clemson University

1:30 PM

**(ICACC-S6-001-2011) Bottom-Up Approach for the Synthesis of Thermoelectric Materials with Nano-Scale Domains\* (Invited)**  
G. Nolas\*, A. Datta, J. Paul, A. Popescu, L. Woods, University of South Florida, USA

2:00 PM

**(ICACC-S6-002-2011) Search for enhanced thermopower in perovskites**  
B. Dabrowski\*, Northern Illinois University, USA

2:20 PM

**(ICACC-S6-003-2011) LSCoO-Mn ceramics as possible material for thermoelectric energy conversion**  
J. Rodriguez\*, L. Moreno, Universidad Nacional de Colombia, Colombia

2:40 PM

**(ICACC-S6-004-2011) Titanium oxide-based materials as potential high temperature thermoelectrics**  
M. Backhaus-Ricoult\*, Corning Incorporated, USA

3:00 PM

Break

3:20 PM

**(ICACC-S6-005-2011) Structure and Thermoelectric behavior of Silver-Chalcogenide Based Composites (Invited)**  
F. Drymiotis\*, S. Lindsey, Clemson University, USA; J. Lashley, Los Alamos National Laboratory, USA; T. Drye, J. Capps, B. Ma, Y. Wang, D. Rhodes, Q. R. Zhang, K. Modic, S. Cawthorne, T. Tritt, Clemson University, USA

3:50 PM

**(ICACC-S6-006-2011) Optimization of Electronic Entropy and Entropy Transport: A Novel Approach to High ZT Materials**  
D. M. Gruen\*, P. Bruno, M. Mendelsohn, J. Routbort, D. Singh, Argonne National Lab., USA

4:10 PM

**(ICACC-S6-007-2011) Synthesis, Structure and Thermoelectric Behavior of Ag<sub>2</sub>Se<sub>1-x</sub>Tex**  
J. Capps\*, D. Rhodes, Q. Zhang, F. Drymiotis, T. Tritt, Clemson University, USA

4:30 PM

**(ICACC-S6-008-2011) Thermoelectric Characterization of Beta Gallia Rutile Intergrowths**  
J. J. Grover, K. J. Scott, D. Edwards\*, Alfred University, USA

4:50 PM

**(ICACC-S6-009-2011) TG-DSC-MS Investigations on Thermoelectric and Semiconductor Materials**  
E. Post\*, NETZSCH Gerätebau GmbH, Germany; B. Fidler, NETZSCH Instruments, USA

5:10 PM

**(ICACC-S6-010-2011) Titanium matrix composites reinforced with in-situ grown CNTs**  
M. Guzman\*, V. Proano, A. Zaretski, Florida International University, USA; A. Datye, The University of Tennessee - Knoxville, USA; K. H. Wu, Florida International University, USA; H. T. Lin, Oak Ridge National Laboratory, USA

5:30 PM

**(ICACC-S6-011-2011) Analysis of capacitance-voltage characteristics of ferroelectric spray deposited KNO<sub>3</sub>: PVA composite films**  
N. Dabra, J. S. Hundal\*, Baba Farid College of engineering and Technology, India

## S7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications

### Synthesis, Functionalization and Processing of Nanostructured Materials I

Room: Coquina Salon C

Session Chairs: Gunnar Westin, Uppsala University; Kathy Lu, Virginia Polytechnic Institute and State University

**1:30 PM**

**(ICACC-S7-048-2011) Raman analysis of selected willemite/olivine (CoxZn2-xSiO4, 0 ≤ x ≤ 2) nanoparticles synthesized by an epoxide-assisted sol-gel method (Invited)**

L. Mduduzi Cele\*, Tshwane University of Technology, South Africa

**2:00 PM**

**(ICACC-S7-049-2011) Microwave-assisted Synthesis & Characterization of Tin Oxide Coated Carbon Nanotubes**

S. C. Motshekga\*, S. Sinha Ray, S. Pillai, Council for Scientific and Industrial Research, South Africa; S. C. Motshekga, University of Johannesburg, South Africa

**2:20 PM**

**(ICACC-S7-051-2011) Controlling of ZnO Precipitation by Polymers**

M. Oner\*, B. Akin, Yildiz Technical University, Turkey

**2:40 PM**

**(ICACC-S7-052-2011) Understanding Effect of Surface Morphology during Focused Ion Beam Guided Anodization (Invited)**

K. Lu\*, B. Chen, Z. Tian, Virginia Polytechnic Institute and State University, USA

**3:10 PM**

**Break**

**3:30 PM**

**(ICACC-S7-053-2011) Microwave Assisted Synthesis and Characterization of Silver/Gold Nanoparticles Loaded Carbon nanotubes**

C. E. Maepa\*, S. Pillai, S. Sinha Ray, Council of Science and Industrial Research, South Africa

**3:50 PM**

**(ICACC-S7-054-2011) Structure and Mechanical Properties of Superhard Nanocomposite Coatings on Ti -Hf-Si-N Base**

A. D. Pogrebnjak\*, Sumy Institute for Surface Modification, Ukraine; V. Beresnev, Sumy State University, Ukraine; M. Kaverin, Sumy Institute for Surface Modification, Ukraine; P. Zukovski, Lublin University of Technology, Poland; F. Komarov, Belgorod State University, Russian Federation; N. Makhmudov, Samarkand Branch of Tashkent University of Information, Uzbekistan; D. Kolesnikov, Belarus State University, Belarus; M. Il'yashenko, S. Danilchenko, V. Baidak, A. Dem'yanyenko, Kharkov National University, Ukraine; P. Konarski, Lublin University of Technology, Poland

**4:10 PM**

**(ICACC-S7-055-2011) Inductively-Coupled Plasma Synthesis of Nanopowders for Optical Applications**

C. Haines\*, US Army ARDEC, USA; R. Sadangi, Rutgers University, USA; D. Martin, D. Kapoor, US Army ARDEC, USA; B. Kear, Rutgers University, USA

**4:30 PM**

**(ICACC-S7-056-2011) Easy synthesis of a nanostructured hybrid with nanoparticles and carbon nanotubes**

S. Moon\*, Japan Aerospace Exploration Agency, Japan; T. Sekino, Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan; T. Ogasawara, Japan Aerospace Exploration Agency, Japan

**4:50 PM**

**(ICACC-S7-057-2011) Synthesis of Nano-Size TiB2 Powders Using Carbon Coated Precursors**

R. Dudukuri, R. Koc\*, J. Mawdsley, D. Carter, Southern Illinois University at Carbondale, USA

**5:10 PM**

**(ICACC-S7-058-2011) ZnO nanowire asters: growth and characterization**

M. Ladanov\*, G. Matthews, M. Ram, A. Kumar, University of South Florida, USA

**5:30 PM**

**(ICACC-S7-059-2011) Synthesis of Nano-sized CaB<sub>6</sub> using Carbon Coated Precursors**

N. A. Siddiqui\*, R. Koc, Southern Illinois University Carbondale, USA; J. Mawdsley, D. Carter, Argonne National Laboratory, USA

## S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

### Thermal Stability

Room: Coquina Salon H

Session Chairs: Nina Lane, Drexel University; Jie Zhang, Materials Chemistry, RWTH-Aachen University

**1:30 PM**

**(ICACC-S12-028-2011) High-temperature Phase Stability of  $\alpha$ -Ta<sub>4</sub>AlC<sub>3</sub>**

N. J. Lane\*, Drexel University, USA; P. Eklund, J. Lu, L. Hultman, Linköping University, Sweden; M. Barsoum, Drexel University, USA

**1:50 PM**

**(ICACC-S12-029-2011) High-Temperature Thermal Stability of Ternary Nitrides: A Comparative Diffraction Study**

I. Low\*, Curtin University of Technology, Australia; E. Wu, Institute of Metals Research, Chinese Academy of Science, China; W. Pang, Curtin University of Technology, Australia

**2:10 PM**

**(ICACC-S12-030-2011) Additive Effects on the Thermal Properties of ZrB<sub>2</sub>**

M. Thompson\*, W. G. Fahrenholtz, G. Hilmas, Missouri University of Science and Technology, USA

**2:30 PM**

**(ICACC-S12-031-2011) Effect of Various Additives on the Oxidation Behavior of HfB<sub>2</sub>-SiC Based Ultra High Temperature Ceramics between 1600 and 2100 °C**

C. Carney\*, T. Parthasarathy, UES, Inc., USA; M. Cinnibulk, Wright Patterson Air Force Base, USA

**2:50 PM**

**(ICACC-S12-032-2011) Effect of Nb, Mo and W Additives on Densification and Oxidation Behavior of Zirconium Diboride**

M. Kazemzadeh Dehdashti\*, W. G. Fahrenholtz, G. E. Hilmas, Missouri University of Science and Technology, USA

**3:10 PM**

**Break**

### Joining and Novel Processing

Room: Coquina Salon H

Session Chairs: Jeremy Watts, Missouri University of Science and Technology; Young-Hoon Seong, Korea Advanced Institute of Science and Technology

**3:30 PM**

**(ICACC-S12-033-2011) Characterization of Fusion Welded ZrB<sub>2</sub>-Based Composites**

H. J. Brown-Shaklee\*, J. Watts, W. G. Fahrenholtz, G. Hilmas, Missouri S&T, USA

**3:50 PM**

**(ICACC-S12-034-2011) Joining Ultra-High Temperature Ceramics using Refractory Metal Braze Compositions**

M. Di Prima\*, W. Pinc, University of Arizona, USA; Z. Wing, Advanced Ceramics Manufacturing, USA; E. Corral, University of Arizona, USA

**4:10 PM****(ICACC-S12-035-2011) Joining Ultra-High Temperature Ceramics Using Boron Rich Braze Materials**

W. Pinc\*, M. Di Prima, University of Arizona, USA; Z. Wing, Advanced Ceramics Manufacturing, USA; E. Corral, University of Arizona, USA

**4:30 PM****(ICACC-S12-036-2011) Application of ZrSi<sub>2</sub> as a precursor for introducing fine SiC within ZrB<sub>2</sub> matrix**

S. Lee\*, S. Song, H. Kim, KIMS, Republic of Korea

**4:50 PM****(ICACC-S12-037-2011) A Novel Method to Fabricate Ceramic Composites with Aligned Fiber Phases**

M. Acosta\*, R. W. Trice, J. P. Youngblood, Purdue University, USA

**5:10 PM****(ICACC-S12-038-2011) Densification of Metal Matrix Composites Comprised of Open-Cell Ceramic Foam Infiltrated with Refractory Metal Powder**

E. J. Faieron\*, K. V. Logan, Virginia Polytechnic Institute and State University-National Institute of Aerospace, USA

**5:30 PM****(ICACC-S12-039-2011) Thermomechanical Properties and Characterization of Heat Treated ZrB<sub>2</sub>-SiC Composites**

E. W. Neuman\*, G. E. Hilmas, W. G. Faherholtz, Missouri University of Science and Technology, USA

**5:50 PM****(ICACC-S12-040-2011) Isothermal Oxidation of Ti<sub>2</sub>GeC in Air**

B. Anasori\*, Y. Elraheb, M. W. Barsoum, Drexel university, USA

**FS1: Geopolymers and Other Inorganic Polymers****Synthesis and Processing**

Room: Coquina Salon F

Session Chair: Waltraud Kriven, University of Illinois at Urbana-Champaign

**1:30 PM****(ICACC-FS1-001-2011) Production of geopolymers from untreated kaolinite (Invited)**

H. Rahier\*, M. Esaifan, J. Wastiels, Vrije Universiteit Brussel, Belgium; F. Slaty, I. Aldabsheh, H. Khoury, University of Jordan, Jordan

**2:00 PM****(ICACC-FS1-002-2011) The Effect of Addition of Pozzolanic Tuff on Geopolymers (Invited)**

H. N. Khoury\*, F. Slaty, I. Aldabsheh, University of Jordan, Jordan; H. Rahier, Vrije Universiteit, Belgium; M. Esaifan, Vrije Universiteit, Belgium; J. Wastiels, Vrije Universiteit, Belgium

**2:30 PM****(ICACC-FS1-003-2011) Bottom ash-based geopolymer materials: mechanical and environmental properties (Invited)**

R. Onori, A. Polettini, R. Pomi, University of Rome "La Sapienza", Italy; J. Will, A. Hoppe, A. Boccaccini\*, University of Erlangen-Nuremberg, Germany

**3:00 PM**

Break

**3:20 PM****(ICACC-FS1-004-2011) Microwave Processing of Geopolymers and Evolved Glass-Ceramic Composites**

T. A. Gubb\*, H. S. Shulman, M. L. Fall, Ceralink, Inc., USA; W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**3:40 PM****(ICACC-FS1-005-2011) Geopolymerization of Rice Hull Ash and Red Mud and Its Potential for Civil Infrastructure Applications**

J. He\*, G. Zhang, Louisiana State University, USA

**Porosity in Geopolymers**

Room: Coquina Salon F

Session Chair: Tammy Metroke, Air Force Research Laboratory

**4:00 PM****(ICACC-FS1-015-2011) Porosity Control of Geomaterial Foams at Low Temperature (Invited)**

J. Henon, A. Alzina, J. Absi, D. Smith, S. Rossignol, S. Delair\*, Gemh, France

**4:30 PM****(ICACC-FS1-006-2011) Geomaterial Foam as Moisture Sensor (Invited)**

E. Prud'homme\*, P. Michaud, GEMH-ENSCI, France; E. Joussein, GRESE, France; S. Rossignol, GEMH-ENSCI, France

**5:00 PM****(ICACC-FS1-007-2011) Inorganic Polymers to Make Porous Ceramics used for Environmental Bioremediation (Invited)**

J. Schorr\*, R. Helferich, S. Sengupta, MetaMateria Technologies, USA

**5:30 PM****(ICACC-FS1-008-2011) Effect of Water Addition to Maintain Workability on Properties of Geopolymers Derived from Metakaolin or Fly Ash**

T. Metroke\*, J. Eichler, Universal Technology Corporation, USA; M. I. Hammons, M. V. Henley, Air Force Research Laboratory, USA

**FS2: Computational Design, Modeling, and Simulation of Ceramics and Composites****Prediction/Simulation of Crystal Structure and Properties**

Room: Coquina Salon D

Session Chairs: Hans Seifert, Technical University of Freiberg; Brain Good, NASA GRC

**1:30 PM****(ICACC-FS2-009-2011) First principles calculations of LISICON-based solid electrolytes for all-solid-state Li-ion batteries (Invited)**

A. Kuwabara\*, Japan Fine Ceramics Center, Japan; Y. Koyama, Kyoto University, Japan; H. Moriwake, Japan Fine Ceramics Center, Japan; K. Nobuhara, Toyota Motor Corporation, Japan; I. Tanaka, Kyoto University, Japan

**2:00 PM****(ICACC-FS2-010-2011) Ab-Initio Modeling of Perovskite Solid Oxide Fuel Cell Cathodes: Surfaces, Strains, and Oxygen Reduction Kinetics (Invited)**

D. Morgan\*, Y. Lee, University of Wisconsin - Madison, USA; J. Rossmeisl, J. Kleis, Technical University of Denmark, Denmark

**2:30 PM****(ICACC-FS2-011-2011) First-principles predictions of crystal structures and properties of hard materials (Invited)**

C. Jiang\*, Central South University, China; Z. Lin, Y. Zhao, Los Alamos National Laboratory, USA

**2:50 PM**

Break

**3:10 PM****(ICACC-FS2-012-2011) Understanding defect chemistry through first-principles calculations and thermodynamic modeling (Invited)**

Z. K. Liu\*, Pennsylvania State University, USA

**3:40 PM****(ICACC-FS2-013-2011) Glasses with temperature and/or pressure independent elastic moduli (Invited)**

L. Huang\*, F. Yuan, Rensselaer Polytechnic Institute, USA

**4:00 PM****(ICACC-FS2-014-2011) Elastic and mechanical properties of doped Hydroxyapatite (HAP) Crystals**

S. Aryai\*, W. Ching, UMKC, USA; K. Matsunaga, Kyoto University, Japan

**4:20 PM****(ICACC-FS2-015-2011) Modelling the Effects of Thermal Stress Cycling in Refractory Systems**

A. A. Pandhari\*, The University of British Columbia, Canada, Canada

**4:40 PM****(ICACC-FS2-016-2011) Ab initio investigation of H-bonding and O K-edge XANES spectra in bulk water**

L. Liang\*, P. Rulis, UMKC, USA; L. Ouyang, Tennessee State University, USA; W. Ching, UMKC, USA

**5:00 PM****(ICACC-FS2-017-2011) Comparative study of XANES spectra of different phases of elemental boron**

L. Wang\*, P. Rulis, W. Ching, UMKC, USA

**5:20 PM****(ICACC-FS2-018-2011) Computational study of wave propagation in second-order nonlinear piezoelectric media**

D. Hopkins\*, G. Gazonas, Army Research Laboratory, USA

**5:40 PM****(ICACC-FS2-019-2011) Degradation of Si<sub>3</sub>N<sub>4</sub> Glow Plugs in Air – Experiment and Modeling**

H. Karimi Sharif\*, C. Oprea, T. Troczynski, The University of British Columbia, Canada; C. Blair, A. Welch, Westport Innovations Inc., Canada

**Friday, January 28, 2011****S1: Mechanical Behavior and Performance of Ceramics & Composites****Joining**

Room: Coquina Salon A

Session Chair: Monica Ferraris, Politecnico di Torino

**8:00 AM****(ICACC-S1-077-2011) Torsion tests for joined ceramics and composites**

A. Ventrella, M. Salvo, M. Avale, M. Ferraris\*, Politecnico di Torino, Italy

**8:20 AM****(ICACC-S1-079-2011) Mechanical strength of silicon-based joints using elementary and structural experiments**

G. Roux\*, O. Gillia, L. Nguyen, V. Chaumat, Commissariat à l'Energie Atomique et aux Energies Alternatives, France

**8:40 AM****(ICACC-S1-080-2011) Characterization of ceramic SiO<sub>2</sub> nanopaste for microreactors shaping**

D. Kata\*, M. Wozniak, P. Izak, AGH University of Science and Technology, Poland; T. Graule, EMPA Swiss Federal Laboratories for materials Testing and Research, Switzerland; J. Lis, AGH University of Science and Technology, Poland

**9:00 AM****Break****Tribological Properties of Ceramics and Composites**

Room: Coquina Salon A

Session Chairs: Monica Ferraris, Politecnico di Torino; Oyelayo Ajayi, Argonne National Laboratory

**9:40 AM****(ICACC-S1-081-2011) Friction performance of carbon fibre reinforced silicon carbide composites under wet conditions**

G. Bian, A. Swarbrick, C. Ji, H. Wu\*, Loughborough University, United Kingdom

**10:00 AM****(ICACC-S1-082-2011) An experimental study on the effects of SiC on the mechanical and wear properties of Cr<sub>3</sub>C<sub>2</sub>-NiCr cermets**

A. Ozer\*, Y. K. Tur, Gebze Institute of Technology, Turkey; W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**10:20 AM****(ICACC-S1-083-2011) Increasing the operating pressure of gasoline injection pumps via ceramic sliding systems**

C. Pfister\*, H. Kubach, U. Spicher, Karlsruhe Institute of Technology, Germany

**10:40 AM****(ICACC-S1-084-2011) Co-continuous ceramic-foam/aluminum interpenetrating composites for wear resistance applications**

J. Liu\*, J. Binner, R. Higginson, C. Munnings, Loughborough University, United Kingdom

**11:00 AM****(ICACC-S1-085-2011) Friction and Wear Behaviors of Al<sub>2</sub>O<sub>3</sub>-15wt% ZrO<sub>2</sub>-Solid Lubricants Nanocomposites at Temperature up to 600 °C**

S. Kim, S. Lee\*, Sun Moon University, Republic of Korea

**11:20 AM****(ICACC-S1-086-2011) Fretting fatigue of engineering ceramic with variable friction loads**

C. Woerner\*, K. Lang, Institut fuer Werkstoffkunde 1, Germany

**S6: International Symposium on Ceramics for Electric Energy Generation, Storage, and Distribution****Materials for Energy Storage and Technologies**

Room: Coquina Salon B

Session Chairs: Fatih Dogan, Missouri University of Science and Technology; Tseung Yuen Tseng, National Chiao Tung University

**8:00 AM****(ICACC-S6-012-2011) Nanostructured Ceramic Dielectrics for High Energy Density Capacitors (Invited)**

F. Dogan\*, Missouri University of Science and Technology, USA

**8:30 AM****(ICACC-S6-013-2011) Fabrication of Manganese Oxide-Carbon Nanotube Nanocomposite Supercapacitors and Their Properties (Invited)**

T. Tseng\*, National Chiao Tung University, Taiwan

**9:00 AM****(ICACC-S6-014-2011) Nano-Engineering of Phase Separable Inclusions in High Performance YBCO Thick Films for Coated Conductors**

T. G. Holesinger\*, D. M. Feldmann, F. J. Baca, B. Maiorov, J. Y. Coulter, L. Civalo, Los Alamos National Laboratory, USA

**9:20 AM****(ICACC-S6-015-2011) Ceramic Processing for Dense Magnesium Diboride**

C. J. Dancer\*, R. I. Todd, C. M. Grovenor, University of Oxford, United Kingdom

9:40 AM

Break

10:00 AM

(ICACC-S6-016-2011) Effect of Double Doping on crystal structure and electrical conductivity of W-containing Bi<sub>2</sub>O<sub>3</sub> solid electrolyte (Invited)

C. Hsieh, C. Liu, C. Ni, K. Fung\*, National Cheng Kung University, Taiwan

10:30 AM

(ICACC-S6-017-2011) Influence of mineral dust on SiC solar absorbers

M. J. Schmucker\*, P. Schwarzbözl, German Aerospace Center (DLR), Germany

10:50 AM

(ICACC-S6-018-2011) Effect of sintering temperature on microstructure and dielectric properties of Cr<sub>2</sub>O<sub>3</sub> doped CCTO (CaCu<sub>3</sub>Ti<sub>4</sub>O<sub>12</sub>) ceramics

M. Mishra\*, V. Koutu, T. D. Senguttuvan, National Physical Laboratory, India

11:10 AM

(ICACC-S6-019-2011) Dielectric Property of Polymer-Derived SiAlCN Ceramics

G. Shao\*, L. An, university of central florida, USA

11:30 AM

(ICACC-S6-020-2011) Electric Properties of Ceramics with Different Compositions

X. Yang\*, G. Shao, L. An, University of Central Florida, USA

## S7: 5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications

### Synthesis, Functionalization and Processing of Nanostructured Materials II

Room: Coquina Salon C

Session Chairs: Sean Li, The University of New South Wales; Francois Ribot, Universite Pierre et Marie Curie

8:00 AM

(ICACC-S7-060-2011) Nanoengineered Hydroxyapatite Nanorod Reinforced Poly (vinyl alcohol) Composite (Invited)

V. Rajendran\*, N. Meenakshisundaram, M. Rajkumar, K. S. Rangasamy College of Technology, India

8:30 AM

(ICACC-S7-061-2011) Enhancement of magnetic properties in rare earth and cobalt codoped ZnO thin films for spintronic applications (Invited)

S. Li\*, The University of New South Wales, Australia

9:00 AM

(ICACC-S7-062-2011) Transformation and Phase Determination of Y<sub>2</sub>O<sub>3</sub> Subject to High Pressure Processing

J. Al-Sharab\*, B. H. Kear, S. Duetsch, S. D. Tse, Rutgers University, USA

9:20 AM

(ICACC-S7-063-2011) Preparation of Strongly Emitting Small Silica Beads with Multiple Quantum Dots and their Surface Modification

N. Murase\*, M. Ando, National Institute of Advanced Industrial Science & Technology (AIST), Japan

9:40 AM

Break

10:00 AM

(ICACC-S7-064-2011) Carbon nitride nanotubes prepared by simple chemical vapour deposition (Invited)

K. Ramesh\*, Indian Institute of Science, India

10:30 AM

(ICACC-S7-015-2011) A New Possibility for Microstructural Investigation of Clay-based Polymer Nanocomposite by Focused-Ion-Beam Tomography

S. Sinha Ray\*, Council for Scientific and Industrial Research, South Africa

10:50 AM

(ICACC-S7-066-2011) Synthesis of Nano-size TiB<sub>2</sub> Powders Using Carbon Coated Precursors

R. Duddukuri\*, R. Koc, Southern Illinois University, Carbondale, USA; J. Mawdsley, D. Carter, Argonne National Laboratory, USA

11:10 AM

(ICACC-S7-067-2011) Probing, in suspension, the ligands on the surface of gold nanoparticles by DOSY NMR

F. Ribot\*, H. Ben Sassi, L. Van Lokeren, Universite Pierre et Marie Curie, France

11:30 AM

(ICACC-S7-068-2011) High Temperature Diffraction Study of In-Situ Formation of TiO<sub>2</sub> Photocatalysts

I. Low\*, Curtin University of Technology, Australia; V. De La Prida, Universidad de Oviedo, Spain

## S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

### Structural Stability under Extreme Environments

Room: Coquina Salon H

Session Chairs: James Zimmermann, Corning Incorporated; Pankaj Sarin, University of Illinois at Urbana-Champaign

8:00 AM

(ICACC-S12-041-2011) Behavior of MAX-phase thin films under 150-240 keV ion irradiation

M. Bugnet, Institut PPRIME, France; P. Eklund, Linköping University, Sweden; A. Declémy, M. Beaufort, Institut PPRIME, France; J. A. Hinks, S. E. Donnelly, University of Salford, United Kingdom; V. Mauchamp, P. Guerin, M. Marteau, F. Pailloux, T. Cabioch\*, M. Jaouen, Institut PPRIME, France

8:20 AM

(ICACC-S12-042-2011) Microstructural investigation of HfB<sub>2</sub>-based ceramics after ultra high temperature testing with a defocused laser beam

D. J. Daniel\*, E. Zapata Solvas, Imperial College London, United Kingdom; E. Sanchez Gonzalez, Universidad de Extremadura, Spain; P. Brown, Defence Science and Technology Laboratory, United Kingdom; W. E. Lee, Imperial College London, United Kingdom

8:40 AM

(ICACC-S12-043-2011) Fabrication and plasma wind tunnel testing of UHTC structures (Invited)

F. Monteverde\*, L. Silvestroni, D. Sciti, ISTECCNR, Italy; R. Savino, M. De Stefano Fumo, University of Naples "Federico II", Italy

9:10 AM

(ICACC-S12-044-2011) High Temperature Oxidation Test of ZrB<sub>2</sub>-based UHTCs by Oxyacetylene Flame

Y. Seong\*, S. Lee, D. Kim, Korea Advanced Institute of Science and Technology, Republic of Korea

## FS1: Geopolymers and Other Inorganic Polymers

### Properties and Composites

Room: Coquina Salon F

Session Chair: Miladin Radovic, Texas A&M University

**8:00 AM**

**(ICACC-FS1-009-2011) Flexural properties of pure and modified geopolymer matrix/ unidirectional fibers reinforced composites (Invited)**

O. Bortnovsky\*, P. Bezucha, Research Institute of Inorganic Chemistry, Czech Republic; D. Tran, D. Kroisova, P. Hajkova, Technical University of Liberec, Czech Republic

**8:30 AM**

**(ICACC-FS1-010-2011) Mechanical Properties of Chopped Fiber Reinforced Geopolymer Composites as a Function of Temperature (Invited)**

T. P. Dietz, W. M. Kriven\*, University of Illinois at Urbana-Champaign, USA

**9:00 AM**

**(ICACC-FS1-011-2011) Thermal Properties of Metakaolin Based Geopolymers**

M. Lizcano\*, Texas A&M University, USA; K. Lozano, University of Texas Pan American, USA; M. Radovic, Texas A&M University, USA

**9:20 AM**

**(ICACC-FS1-012-2011) Synthesis and thermal properties of fly-ash based geopolymer pastes and mortars**

C. Panagiotopoulou\*, A. Asprogerakas, G. Kakali, S. Tsvivilis, N.T.U.A, Greece

**9:40 AM**

**Break**

**10:00 AM**

**(ICACC-FS1-013-2011) Mechanical Response of Discontinuous Filament PVA Fiber Reinforced Geopolymers (Invited)**

B. Varela\*, J. W. Rogers, Rochester Institute of Technology, USA

**10:30 AM**

**(ICACC-FS1-014-2011) Effect of External and Internal Calcium in Synthetic Fly Ash on Geopolymer Properties (Invited)**

K. Somna\*, W. Bumrongjaroen, W. Gong, I. Muller, Catholic University of America, USA

### Phosphate-Based Inorganic Polymers

Room: Coquina Salon F

Session Chair: Hubert Rahier, Vrije Universiteit Brussel

**11:00 AM**

**(ICACC-FS1-015-2011) Phosphate Geopolymeric Materials (Invited)**

A. Wagh\*, Consultant, USA

**11:30 AM**

**(ICACC-FS1-016-2011) Development of Phosphate Grout Formulations for Placement in Closed-Out Reactors (Invited)**

Y. Yusufoglu\*, R. Ganga, D. Singh, Argonne National Laboratory, USA

## FS2: Computational Design, Modeling, and Simulation of Ceramics and Composites

### Novel Simulation Methods for Materials Processing and Performance

Room: Coquina Salon D

Session Chairs: Peter Gumbsch, KIT; Z. Liu, Pennsylvania State University

**8:00 AM**

**(ICACC-FS2-020-2011) Thermodynamic Modeling in Zirconia-base Systems for Thermal Barrier Coatings (Invited)**

H. J. Seifert\*, M. Kriegel, O. Fabrichnaya, Technical University of Freiberg, Germany

**8:30 AM**

**(ICACC-FS2-021-2011) Developing High-Performance Materials in Clean Power Systems: An Integrated Computational and Experimental Approach (Invited)**

M. Gao\*, D. Tafen, K. Wu, R. Hu, V. Jain, O. Dogan, J. Hawk, National Energy Technology Lab, USA; M. Widom, Carnegie Mellon University, USA

**9:00 AM**

**(ICACC-FS2-022-2011) Materials Design for Low Thermal Conductivity Ceramics (Invited)**

J. Wang\*, Y. Zhou, Shenyang National Laboratory for Materials Science, Institute of Metal Research, China

**9:20 AM**

**(ICACC-FS2-023-2011) Ab initio Calculation of Electrical Conductivity in Metals**

Y. Mo\*, P. Rulis, W. Ching, University of Missouri-Kansas City, USA

**9:40 AM**

**Break**

**10:00 AM**

**(ICACC-FS2-024-2011) Electronic structure, bonding, and spectroscopic properties of two new lithium nitridosilicates: Advocate for the effective ab initio OLCAO method (Invited)**

W. Ching\*, P. Rulis, University of Missouri-Kansas City, USA

**10:30 AM**

**(ICACC-FS2-025-2011) Development of Grain Boundary "Phase" Diagrams as a New Materials Science Tool (Invited)**

J. Luo\*, Clemson University, USA

**11:00 AM**

**(ICACC-FS2-026-2011) Optimal elastic design of CFCs by microstructure modeling using semi-analytical methods**

R. Piat\*, G. Stasiuk, S. Dietrich, J. Gebert, Karlsruhe Institute of Technology, Germany; I. Tsukrov, University of New Hampshire, USA; T. Böhlike, A. Wanner, K. Weidenmann, Karlsruhe Institute of Technology, Germany

**11:20 AM**

**(ICACC-FS2-027-2011) Effects of Architecture on the Failure of Woven CMCs Via the Multiscale Generalized Method of Cells**

K. Liu\*, Arizona State University, USA; S. M. Arnold, NASA Glenn Research Center, USA; L. Necefer, University of Kansas, USA; A. Chattopadhyay, Arizona State University, USA

**11:40 AM**

**(ICACC-FS2-028-2011) Characterization of non uniform veneer layer thickness distribution on curved substrate Zirconia ceramics using X-ray micro-tomography**

M. Allahkarami\*, J. C. Hanan, Oklahoma State University (OSU), USA

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