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## **ACerS Engineering Ceramics Division Leadership**

**Trustee:** Mrityunjay Singh

**Chair:** Sanjay Mathur

**Chair-Elect:** Sujanto Widjaja

**Vice Chair/Treasurer:** Michael Halbig

**Secretary:** Soshu Kirihara

**Past Chair:** Dileep Singh

# Schedule At A Glance

	Time	Room
<b>Sunday, January 27, 2013</b>		
Conference Registration	2:00 – 7:00 PM	Hilton – Coquina Foyer
Speaker Ready Room	2:00 – 7:00 PM	Hilton – Manatee
Welcome Reception	5:00 – 7:00 PM	Hilton – Coquina Foyer
<b>Monday, January 28, 2013</b>		
Conference Registration	7:00 AM – 6:00 PM	Hilton – Coquina Foyer
Member and Publication Center	7:00 AM – 6:00 PM	Hilton – Coquina Foyer
Speaker Ready Room	8:00 AM – 4:00 PM	Hilton – Manatee
Companion Coffee	8:00 – 10:00 AM	Hilton – Oceanview Room
Opening Awards Ceremony & Plenary Session	8:30 AM – Noon	Hilton – Coquina D and E
Coffee Break	10:20 – 10:40 AM	Hilton – Coquina Foyer
Lunch On Own	Noon – 1:30 PM	
Concurrent Technical Sessions	1:30 – 6:00 PM	Hilton
Coffee Break	3:00 – 3:20 PM	Hilton – Coquina Foyer
Student & Young Professional Mixer	7:00 – 9:00 PM	Hilton – Oceanview
<b>Tuesday, January 29, 2013</b>		
Conference Registration	7:00 AM – 6:00 PM	Hilton – Coquina Foyer
Member and Publication Center	7:00 AM – 6:00 PM	Hilton – Coquina Foyer
Speaker Ready Room	8:00 AM – 4:00 PM	Hilton – Manatee
Concurrent Technical Sessions	8:00 AM – Noon	Hilton
Coffee Break	9:40 – 10:00 AM	Hilton – Coquina Foyer
Exhibitor Move-In	Noon – 4:00 PM	Ocean Center
Lunch On Own	Noon – 1:30 PM	
Concurrent Technical Sessions	1:30 – 5:20 PM	Hilton
Coffee Break	3:00 – 3:20 PM	Hilton – Coquina Foyer
Poster Session A Move-In	3:00 – 4:30 PM	Ocean Center
Exhibits & Poster Session A – Including Reception	5:00 – 8:00 PM	Ocean Center
<b>Wednesday, January 30, 2013</b>		
Conference Registration	7:30 AM – 5:30 PM	Hilton – Coquina Foyer
Member and Publication Center	7:30 AM – 5:30 PM	Hilton – Coquina Foyer
Speaker Ready Room	8:00 AM – 4:00 PM	Hilton – Manatee
Concurrent Technical Sessions	8:00 AM – Noon	Hilton
Coffee Break	9:40 – 10:00 AM	Hilton – Coquina Foyer
Lunch On Own	Noon – 1:30 PM	
Concurrent Technical Sessions	1:30 – 5:00 PM	Hilton
Poster Session B Move-In	3:00 – 4:30 PM	Ocean Center
Coffee Break	3:00 – 3:20 PM	Hilton – Coquina Foyer
Exhibits & Poster Session B – Including Reception	5:00 – 7:30 PM	Ocean Center

# Schedule At A Glance

## Thursday, January 31, 2013

Conference Registration	7:30 AM – 6:00 PM	Hilton – Coquina Foyer
Member and Publication Center	7:30 AM – Noon	Hilton – Coquina Foyer
Speaker Ready Room	8:00 AM – 4:00 PM	Hilton – Manatee
Concurrent Technical Sessions	8:00 AM – Noon	Hilton
Coffee Break	9:40 – 10:00 AM	Hilton – Coquina Foyer
Lunch On Own	Noon – 1:30 PM	
Concurrent Technical Sessions	1:30 – 6:00 PM	Hilton
Coffee Break	3:00 – 3:20 PM	Hilton – Coquina Foyer

## Friday, February 1, 2013

Conference Registration	7:30 AM – 12:30 PM	Hilton – Coquina Foyer
Concurrent Technical Sessions	8:00 AM – Noon	Hilton
Coffee Break	9:40 – 10:00 AM	Hilton – Coquina Foyer

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# Special Events

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## Welcome Reception

Sunday, January 27

5 p.m. – 7 p.m.

Hilton – Coquina Foyer

## Shot Glass Contest

Tuesday, January 29

7 p.m. – 8 p.m.

The Ocean Center, Exhibit Show Floor

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

## Exhibits and Reception

Tuesday, January 29

5 p.m. – 8 p.m.

Wednesday, January 30

5 p.m. – 7:30 p.m.

Don't miss this design contest! Students are given one shot glass and have 30 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\*

Instructors: George D. Quinn, NIST and Richard C. Bradt, University of Alabama

Thursday, January 31 and Friday, February 1

8:00 a.m. – 5:00 p.m.

Hilton – Tomoka B

\*Separate registration fee

# Directions from the Hilton to Ocean Center Arena

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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:

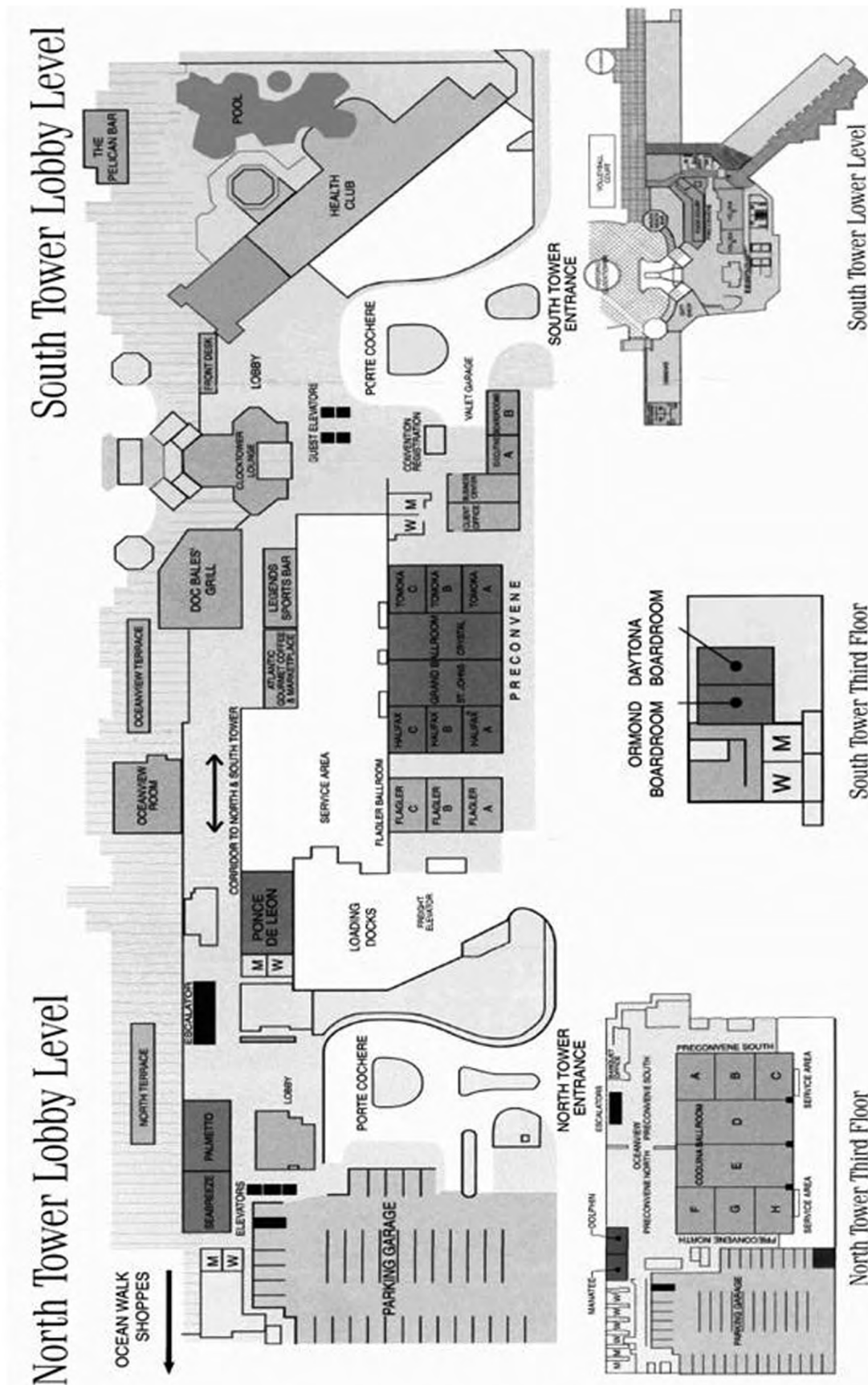
Welcome Reception  
Registration  
Technical Sessions  
Member and Publications  
Center

### Ocean Center:

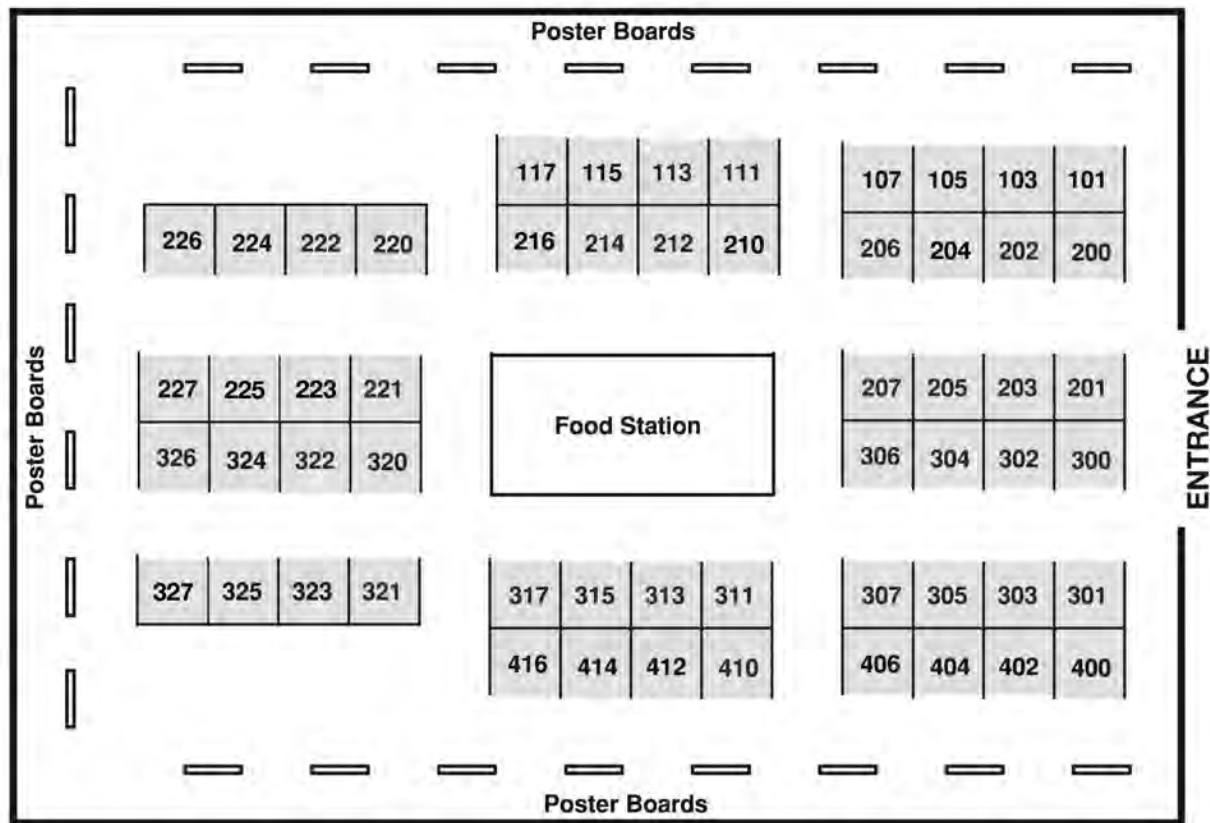
Exhibit & Reception  
Poster Session

# Hilton Meeting Room Floor Plan

## Hilton Daytona Beach Oceanfront Resort Floor Plan



# Expo Floor Plan & Booth Information



Exhibitor	Booth #	Exhibitor	Booth #
AACCM	304	Heraeus Thick Film Division	225
ACT-RX Technology Corp.	223	Hockmeyer Equipment	324
Alfred University	212	INNOVNANO - Advanced Materials S.A.	117
American Ceramic Society	105	Keith Company	322
ANF Technology Ltd.	327	Linseis Inc.	323
ANOR Precision Ceramic Industrial Co. Ltd.	223	Maney Publishing	101
AVS, Inc.	210	MEL Chemicals	315
Baikowski International Corp.	402	Microtrac	400
Buhler Inc.	301	MTI	214
Carbolite, Inc.	206	Nabertherm	303
Centorr Vacuum Industries	416	Netsch Instruments N.A. LLC	201
CM Furnaces, Inc.	311	New Lenox Machine Co. Inc.	306
Daiichi Jitsugyo (America) Inc.	227	NIST	111,113
Deltech Inc.	406	Oxy-Gon Industries, Inc.	300
Dorst America	220	Powder Processing & Technology LLC	204
Dunhua Zhengxing Abrasives Co., Ltd.	205	PremaTech Advanced Ceramics	207
Dynamic Dispersions LLC	203	Quantachrome Instruments	224
Eirich Machines, Inc.	222	Sonoscan Inc.	221
ENrG Incorporated	321	Swindell Dressler International	302
ESL ElectroScience	202	TA Instruments	107
Evans Analytical Group	313	TEAM by Sacmi - Laeis GmbH	325
fuelcellmaterials.com	115	TevTech	317
Gasbarre Products (PTX-Pentronix)	307	Thermal Wave Imaging	216
GE Aviation	103	Thermaltek, Inc.	414
H.C. Starck Inc.	305	UCM Advanced Ceramics GmbH	226
Haiku Tech, Inc.	320	Union Process	410
Harper International	326	Vision Research	404
Harrop Industries	200	Zircar Ceramics, Inc.	412

# Plenary Speakers

## 2013 James I. Mueller Award

Title: "Failure of Ceramics under Externally Applied Loads and Internally Generated Pressures: Zirconia, a Unique Material"

9:00 AM



**Anil V. Virkar**

*Distinguished Professor, Department Chair, College of Engineering, Department of Materials Science and Engineering, University of Utah*

Virkar is a cofounder and Vice President of Materials and Systems Research, Inc., a small company based in Salt Lake City, Utah; a cofounder of Versa Power Systems, a Colorado-based company with operations in Calgary and serves on its board. He also was a founding member of Ceramatec, Inc., a small company based in Salt Lake City, Utah. Recently, he along with a few colleagues have formed a new venture named Nano-Oxides, Inc. He is a member of the National Academy of Engineering. Virkar received B.Tech. (Hons.) in Metallurgical Engineering from Indian Institute of Technology, Mumbai, India (1967); M.S. in Engineering Mechanics from Louisiana State University (1969); and Ph.D. from Northwestern University in Materials Science (1973). His research interests include ceramics, ionic and electronic conductors, fuel cells, batteries, solid state electrochemistry, renewable energy, sensors, transport, thermodynamics of high temperature materials; and fracture of materials.

## 2013 Bridge Building Award

Title: "Microstructural Evolution and Mechanical Properties of Engineering Ceramics"

9:40 AM



**Tatsuki Ohji**

*Prime Senior Research Scientist, National Institute of Advanced Industrial Science and Technology (AIST) and Designated Professor in the Graduate School of Science and Engineering, Meijo University*

Ohji earned his BS and MS in mechanical engineering from Nagoya Institute of Technology and PhD in inorganic materials engineering from Tokyo Institute of Technology, he has authored or coauthored more than 330 peer-reviewed papers and 12 book chapters, edited 30 books and conference volumes, chaired or co-chaired more than 20 international conferences and symposia, and holds more than 40 patents. A recipient of numerous honors and awards, he is a Fellow of the American Ceramic Society and ASM International, and Academician of the World Academy of Ceramics. He serves as a Governor of Acta Materialia, Inc., and on the editorial boards of many international journals including International Materials Reviews, Journal of the American Ceramic Society, and International Journal of Applied Ceramic Technology. His research interests include mechanical property characterization of ceramics, ceramic composites and porous materials, microstructural design of ceramic materials for better performance, and green manufacturing of ceramic components. He was a Chair of The American Ceramic Society's Engineering Ceramic Division in 2010-2011.

## Plenary Speaker

Title: "Designing Ceramics for Electrochemical Energy Storage Devices"

10:40 AM



**Bruce Dunn**

*Nippon Sheet Glass Professor of Materials Science and Engineering, UCLA*

Dunn was a staff scientist at the General Electric Research and Development Center before joining UCLA. His research interests concern the synthesis of organic-inorganic materials and characterization of their electrical, optical, biological and electrochemical properties. A continuing theme in his research is the use of sol-gel methods to synthesize materials with designed microstructures and properties. His recent work on electrochemical energy storage includes three-dimensional batteries and pseudocapacitor materials.

## Plenary Speaker

Title: "Novel materials development - What's next? – The role of Root Industry Technology"

11:20 AM



**Sangmok Lee**

*Executive Director, Incheon Regional Division, Korea Institute of Industrial Technology*

Sangmok Lee received his BS degree (1986), MS degree (1989), PhD degree (1997) in Metallurgical Engineering from Yonsei University in Seoul. He was a visiting researcher in Oxford University with the British Council Scholarship during 1994-95. He has been with KITECH since 2001 and served as the Director of Korea Eurasia Cooperation Centers in KITECH from 2005 to 2011. His main research interests are casting technology and Root Industry Technology that is a main focus of Incheon Regional Division of KITECH. He has served as a PI on over 200 programs sponsored by Ministry of Knowledge and Economy of Korea, and he also collaborates very actively with researchers at institution in Korea, U.S., Europe, China, and Japan. He holds 20 patents and has authored/co-authored nearly 200 original research publications. He is a Member of Board of Directors in Korean Institute of Metals and Materials and Korea Foundry Soc. Also he is a chairman of semi-solid subcommittee in Korea Society for Technology of Plasticity and International Cooperation Committee in Korea Foundry Society.

# Technical Sessions By Symposium

Session Title	Day	Time	Location
<b>S1: Mechanical Behavior and Performance of Ceramics &amp; Composites</b>			
Mechanics and Characterizations	Jan. 28	1:30 - 5:50 PM	Coquina Salon D
Processing, Microstructure and Mechanical Properties Correlation I	Jan. 29	8:00 - 11:40 AM	Coquina Salon D
Processing, Microstructure and Mechanical Properties Correlation II	Jan. 29	1:30 - 5:30 PM	Coquina Salon D
S1 Poster Session	Jan. 29	5:30 - 8:00 PM	Ocean Center
Fiber, Matrices, and Interfaces	Jan. 30	8:00 AM - Noon	Coquina Salon D
Mechanical Behaviors of CMCs	Jan. 30	1:30 - 4:50 PM	Coquina Salon D
Tribological Performance and Impact Testing of Ceramics and Composites	Jan. 31	8:00 - 10:40 AM	Coquina Salon D
Environmental Effects on Mechanical Performance of CMCs	Jan. 31	1:30 - 5:50 PM	Coquina Salon D
<b>S2: Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications</b>			
Environmental Barrier Coatings	Jan. 28	1:30 - 5:50 PM	Ponce DeLeon
Thermal Barrier Coatings I	Jan. 29	8:00 AM - Noon	Ponce DeLeon
Thermal Barrier Coatings II	Jan. 29	1:30 - 3:20 PM	Ponce DeLeon
Coating for Tribological Applications	Jan. 29	3:20 - 5:30 PM	Ponce DeLeon
S2 Poster Session	Jan. 29	5:30 - 8:00 PM	Ocean Center
Multifunctional Coatings	Jan. 30	8:00 AM - Noon	Ponce DeLeon
<b>S3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology</b>			
SOFC Applications	Jan. 29	8:00 AM - Noon	Coquina Salon H
Electrodes-I	Jan. 29	1:30 - 5:20 PM	Coquina Salon H
Electrodes II	Jan. 30	8:00 AM - Noon	Coquina Salon H
Interfacial Reactions/Degradation	Jan. 30	1:30 - 4:00 PM	Coquina Salon H
Sealing Glasses	Jan. 30	4:00 - 5:00 PM	Coquina Salon H
S3 Poster Session	Jan. 30	5:00 - 7:30 PM	Ocean Center
Processing/Performance	Jan. 31	8:00 AM - Noon	Coquina Salon H
Interconnects/Coatings	Jan. 31	1:30 - 6:00 PM	Coquina Salon H
Mechanical/Thermal Properties	Feb. 1	8:00 - 9:20 AM	Coquina Salon H
Electrolysis etc.	Feb. 1	9:20 - Noon	Coquina Salon H
<b>S4: Armor Ceramics</b>			
Transparent Ceramics & Glasses	Jan. 28	1:30 - 6:10 PM	Coquina Salon E
Brittle Materials Modeling	Jan. 29	8:00 - 10:10 AM	Coquina Salon E
Materials in Extreme Dynamic Environments (MEDE)	Jan. 29	10:10 AM - Noon	Coquina Salon E
Boron-Icosahedral Based Ceramics I	Jan. 29	1:20 - 5:10 PM	Coquina Salon E
S4 Poster Session	Jan. 29	5:30 - 8:00 PM	Coquina Foyer
Boron-Icosahedral Based Ceramics II	Jan. 30	8:00 - 9:50 AM	Coquina Salon E
Quasi-Static and Dynamic Behavior I	Jan. 30	9:50 AM - Noon	Coquina Salon E
Quasi-Static and Dynamic Behavior II	Jan. 30	1:20 - 4:20 PM	Coquina Salon E
Synthesis and Processing I	Jan. 30	4:20 - 5:10 PM	Coquina Salon E
Synthesis and Processing II	Jan. 31	1:20 - 3:50 PM	Crystal Ballroom
Non-Destructive Evaluation	Jan. 31	3:50 - 5:10 PM	Crystal Ballroom



# Technical Sessions By Symposium

## ***S5: Next Generation Bioceramics and Biocomposites***

Porous Bioceramics	Jan. 30	1:30 - 4:40 PM	Coquina Salon C
S5 Poster Session	Jan. 30	5:00 - 7:30 PM	Ocean Center
Medical Ceramics	Jan. 31	8:00 - 11:40 AM	Coquina Salon C
Advanced Bioceramics	Jan. 31	1:30 - 5:40 PM	Coquina Salon C
Ceramics for Medical and Dental Applications	Feb. 1	8:00 - 11:40 AM	Coquina Salon C

## ***S6: Advanced Materials and Technologies for Energy Generation and Rechargeable Energy Storage***

Li-ion Battery Technology - Advanced Electrodes	Jan. 28	1:30 - 5:40 PM	Coquina Salon G
Li-ion Battery Technology - Design and Interface	Jan. 29	8:00 - 10:00 AM	Coquina Salon G
Materials for Energy Storage - Supercapacitors	Jan. 29	10:00 AM - Noon	Coquina Salon G
Materials for Clean Energy Technologies	Jan. 29	1:30 - 3:20 PM	Coquina Salon G
Energy Storage Technology	Jan. 29	3:20 - 5:20 PM	Coquina Salon G
S6 Poster Session	Jan. 29	5:30 - 8:00 PM	Ocean Center
Advanced Materials for Energy Harvesting and Storage	Jan. 30	8:00 - 11:00 AM	Coquina Salon G

## ***S7: 7th International Symposium on Nanostructured Materials and Nanocomposites***

Synthesis and Applications of Functional Nanostructures I	Jan. 28	1:30 - 3:20 PM	Coquina Salon B
Synthesis and Applications of Functional Nanostructures II	Jan. 28	3:20 - 6:00 PM	Coquina Salon B
Nanomaterials for Energy Applications I	Jan. 29	8:00 - 10:00 AM	Coquina Salon B
Nanomaterials for Energy Applications II	Jan. 29	10:00 AM - 12:10 PM	Coquina Salon B
Chemical Processing of Nanomaterials I	Jan. 29	1:30 - 3:30 PM	Coquina Salon B
Functional Nanocomposites	Jan. 29	3:30 - 5:40 PM	Coquina Salon B
Chemical Processing of Nanomaterials II	Jan. 30	8:00 - 9:50 AM	Coquina Salon B
Nanotubes, Nanorods, Nanowires and Other One-dimensional Structures	Jan. 30	9:50 AM - Noon	Coquina Salon B
Bio-active Nanomaterials and Nanostructured Materials for Bio-medical Applications	Jan. 30	1:30 - 5:30 PM	Coquina Salon B
S7 Poster Session	Jan. 30	5:00 - 7:30 PM	Ocean Center
Innovative Processing of Functional Materials	Jan. 31	8:00 - 10:00 AM	Coquina Salon B
Surfaces and Controlled Interface Properties	Jan. 31	10:00 AM - Noon	Coquina Salon B
Patterning and Tomography I	Jan. 31	1:30 - 3:30 PM	Coquina Salon B
Patterning and Tomography II	Jan. 31	3:30 - 6:10 PM	Coquina Salon B

## ***S8: 7th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT)***

Novel Processing for Functional Materials	Jan. 28	1:30 - 6:00 PM	Coquina Salon A
Advanced Composite Manufacturing	Jan. 29	8:00 AM - Noon	Coquina Salon A
Integration & Joining	Jan. 29	1:30 - 3:20 PM	Coquina Salon A
Design-Oriented Manufacturing	Jan. 29	3:20 - 5:10 PM	Coquina Salon A
S8 Poster Session	Jan. 29	5:30 - 8:00 PM	Ocean Center
SPS & SHS	Jan. 30	8:00 - 10:00 AM	Coquina Salon A
Novel Sintering Technologies	Jan. 30	10:00 AM - Noon	Coquina Salon A
Prototyping, Patterning & Shaping	Jan. 30	3:20 - 5:20 PM	Coquina Salon A

# Technical Sessions By Symposium

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

Processing Methods for Porous Ceramics I	Jan. 28	1:30 - 3:20 PM	Coquina Salon C
Processing Methods for Porous Ceramics II	Jan. 28	3:20 - 6:00 PM	Coquina Salon C
Membranes and High SSA Ceramics	Jan. 29	8:00 - 10:10 AM	Coquina Salon C
Processing Methods for Porous Ceramics III	Jan. 29	10:10 AM - Noon	Coquina Salon C
Processing Methods for Porous Ceramics IV	Jan. 29	1:30 - 3:20 PM	Coquina Salon C
Mechanical Properties of Porous Ceramics	Jan. 29	3:20 - 6:00 PM	Coquina Salon C
S9 Poster Session	Jan. 29	5:30 - 8:00 PM	Ocean Center
Applications of Porous Ceramics I	Jan. 30	8:00 - 9:50 AM	Coquina Salon C
Applications of Porous Ceramics II	Jan. 30	9:50 - 11:30 AM	Coquina Salon C
Joint S8 & S9: Rapid Prototyping of Porous Ceramics	Jan. 30	1:30 - 3:20 PM	Coquina Salon A

## **S10: Virtual Materials (Computational) Design and Ceramic Genome**

Prediction and Modeling of Properties of Ceramics and Composites	Jan. 29	8:00 AM - Noon	Oceanview
Innovative Modeling and Simulation Methods	Jan. 29	1:30 - 5:20 PM	Oceanview
Modeling of Defects and Diffusion in Ceramics	Jan. 30	8:00 AM - Noon	Oceanview
Virtual Materials Design and Modeling	Jan. 30	1:30 - 5:00 PM	Oceanview

## **S11: Next Generation Technologies for Innovative Surface Coatings**

S11 Poster Session	Jan. 30	5:00 - 7:30 PM	Ocean Center
Low Friction Coating for Automobile Applications	Jan. 31	1:30 - 3:40 PM	Coquina Salon E
Advanced Coating for Energy Process	Jan. 31	3:40 - 6:30 PM	Coquina Salon E
NEXT Generation Coating	Feb. 1	8:00 - 10:20 AM	Coquina Salon E
Innovative Surface Coating	Feb. 1	10:20 AM - 12:10 PM	Coquina Salon E

## **S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)**

Materials Design: MAX Phases and UHTCs	Jan. 29	1:30 - 3:20 PM	Coquina Salon F
Materials Design II	Jan. 29	3:20 - 4:40 PM	Coquina Salon F
Structure-Property Relationships I	Jan. 29	4:40 - 5:40 PM	Coquina Salon F
Structure-Property Relationships II	Jan. 30	8:00 - 9:50 AM	Coquina Salon F
Structure-Property Relationships III	Jan. 30	9:50 AM - Noon	Coquina Salon F
Structural Stability under Extreme Environments I	Jan. 30	1:30 - 3:20 PM	Coquina Salon F
Structural Stability under Extreme Environments II	Jan. 30	3:20 - 5:10 PM	Coquina Salon F
S12 Poster Session	Jan. 30	5:00 - 7:30 PM	Ocean Center
Novel Characterization Methods and Lifetime Assessment I	Jan. 31	8:00 - 10:00 AM	Coquina Salon F
Novel Characterization Methods and Lifetime Assessment II	Jan. 31	10:00 - 11:50 AM	Coquina Salon F
Novel Methods for Joining and Machining of Components	Jan. 31	1:30 - 3:20 PM	Coquina Salon F
Novel Processing Methods	Jan. 31	3:20 - 6:00 PM	Coquina Salon F
Methods for Improving Damage Tolerance, Oxidation and Thermal Shock Resistance I	Feb. 1	8:00 - 9:50 AM	Coquina Salon F
Methods for Improving Damage Tolerance, Oxidation and Thermal Shock Resistance II	Feb. 1	9:50 - 11:30 AM	Coquina Salon F

# Technical Sessions By Symposium

## ***S13: Advanced Ceramics and Composites for Sustainable Nuclear Energy and Fusion Energy***

Radiation Defects in Ceramics / Codes and Standards	Jan. 30	1:30 - 5:00 PM	Ponce DeLeon
S13 Poster Session	Jan. 30	5:00 - 7:30 PM	Ocean Center
Ceramic Technology for Light Water Reactor Fuels	Jan. 31	8:00 AM - 12:10 PM	Ponce DeLeon
Joining / Irradiation and Environmental Effects I / Fabrication and Processing of Ceramic Functional Materials	Jan. 31	1:30 - 6:10 PM	Ponce DeLeon
Irradiation and Environmental Effects II & III	Feb. 1	8:00 AM - Noon	Ponce DeLeon

## ***2nd Global Young Investigators Forum***

Applications: Ceramic Sensors and Actuators, Energy Generation and Storage, Photo-catalysis I	Jan. 28	1:30 - 3:30 PM	Coquina Salon F
Applications: Ceramic Sensors and Actuators, Energy Generation and Storage, Photo-catalysis II	Jan. 28	3:30 - 5:30 PM	Coquina Salon F
Ceramic Hybrid Materials and Composites: Ceramic Matrix Composites, Biological and Medical Applications	Jan. 29	8:00 - 9:40 AM	Coquina Salon F
Ceramic Processing and Application: Novel Processing and Synthesis Routes	Jan. 29	9:40 AM - Noon	Coquina Salon F

## ***Engineering Ceramics Summit of the Americas***

Ceramics for Human Health	Jan. 30	1:30 - 4:50 PM	Coquina Salon G
ECSA Poster Session	Jan. 30	5:00 - 7:30 PM	Ocean Center
Ceramic Education, Training, and Collaboration	Jan. 31	8:00 AM - Noon	Coquina Salon G
Ceramics for Energy and Environmental Systems	Jan. 31	1:30 - 5:50 PM	Coquina Salon G
Ceramics for Energy and Aerospace Systems	Feb. 1	8:00 AM - Noon	Coquina Salon G

## ***FS1: Geopolymers and Chemically Bonded Ceramics***

Microstructure, Synthesis and Processing	Jan. 31	8:00 AM - Noon	Coquina Salon A
Porosity	Jan. 31	1:30 - 3:20 PM	Coquina Salon A
Mechanical Properties	Jan. 31	3:20 - 6:20 PM	Coquina Salon A
Construction Materials, Composites and Novel Applications	Feb. 1	8:00 AM - Noon	Coquina Salon A

## ***FS2: Thermal Management Materials and Technologies***

Thermal Management Materials and Technologies	Jan. 28	1:30 - 2:50 PM	Coquina Salon H
FS2 Poster Session	Jan. 29	5:30 - 8:00 PM	Ocean Center

## ***FS3: Nanomaterials for Sensing Applications: Fundamental Material Designs to Device Integration***

Nanomaterials for Sensing Applications	Jan. 28	3:20 - 5:20 PM	Coquina Salon H
FS3 Poster Session	Jan. 29	5:30 - 8:00 PM	Ocean Center

## ***FS4: Advanced Ceramic Materials and Processing for Photonics and Energy***

FS4 Poster Session	Jan. 30	5:00 - 7:30 PM	Ocean Center
Advanced and Nanostructured materials for photonics	Jan. 31	8:00 - 11:50 AM	Oceanview
Advanced and Nanostructured Materials for Photovoltaics, including Solar Hydrogen	Jan. 31	1:30 - 4:45 PM	Oceanview
Advanced and Nanostructured Materials for Sensing and Electronics	Jan. 31	4:45 - 6:00 PM	Oceanview
Multifunctional Materials	Feb. 1	8:00 - 11:50 AM	Oceanview

# Symposia

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## 2013 Program Chair: Sujanto Widjaja, Corning Incorporated

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

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

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

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

### **Symposium 3: 9th International Symposium on Solid Oxide Fuel Cells: Materials, Science, and Technology**

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

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

**Organizers:** Jerry LaSalvia, US Army Research Laboratory, USA; James Campbell, US Army Research Laboratory, USA; Lisa Prokurat Franks, US Army TARDEC, USA; Todd L. Jessen, US Army Research Laboratory; Brian Leavy, US Army Research Laboratory, USA; James McCauley, US Army Research Laboratory, USA; David Stepp, US Army Research Office, USA; Jeffrey J. Swab, US Army Research Laboratory, USA; Andrew Wereszczak, Oak Ridge National Laboratory, USA

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

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

### **Symposium 6: Advanced Materials and Technologies for Energy Generation and Rechargeable Energy Storage**

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

### **Symposium 7: 7th International Symposium on Nanostructured Materials and Nanocomposites**

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

### **Symposium 8: 7th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT)**

**Organizers:** Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST), Japan; Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center, USA; Soshu Kirihaara, Osaka University, Japan; Eugene Medvedovski, Umicore Indium Products, USA; Ian Nettleship, University of Pittsburgh, USA; Lalit Kumar Sharma, Central Glass & Ceramic Research Institute, India; Richard D. Sisson, Jr., Worcester Polytechnic Institute, USA; Hisayuki Suematsu, Nagaoka University of Technology, Japan; Nahum Travitzky, University of Erlangen-Nuremberg, Germany

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

**Organizers:** Paolo Colombo, University of Padova, Italy; James Zimmerman, Corning Incorporated, USA; Lennart Bergstrom, University of Stockholm, Sweden; Aldo Boccaccini, University of Erlangen-Nuremberg, Germany; Yuji Iwamoto, Nagoya Institute of Technology, Japan; Alek Pyzik, The Dow Chemical Company; Thomas R. Watkins, Oak Ridge National Laboratory, USA; Yuping Zhen, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

## **Symposium 10: Virtual Materials (Computational) Design and Ceramic Genome**

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

## **Symposium 11: Next Generation Technologies for Innovative Surface Coatings**

**Organizers:** Taejin Hwang, Korea Institute of Industrial Technology, Korea; Kyoung Il Moon, Korea Institute of Industrial Technology, Korea; Dileep Singh, Argonne National Laboratory, USA; Alan W. Weimer, University of Colorado, USA; Sang Sub Kim, Inha University, Korea; Se Hoon Kwon, Pusan National University, Korea; Tadachika Nakayama, Nagaoka University of Technology, Japan; Jun Akedo, The National Institute of Advanced Industrial Science and Technology (AIST), Japan; Tim Hosenfeldt, Schaeffler Group, Germany; Do-Suck Han, Hyundai Motor Group, Korea; Xihua Xiong, Nanyang Technological University

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

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

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

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

## **Focused Session 1: Geopolymers and Chemically Bonded Ceramics**

**Organizers:** Waltraud M. Kriven: University of Illinois at Urbana-Champaign, USA; John L. Provis, The University of Sheffield, UK; Maricela Lizzcano, NASA-Glenn Research Center, USA

## **Focused Session 2: 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 Laboratory, USA; Rajiv Asthana, University of Wisconsin-Stout, USA; Ajit K. Roy, Air Force Research Laboratory, WPAFB, USA; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology, Japan; You Zhou, National Institute of Advanced Industrial Science and Technology, Japan; Khairul Alam, Ohio University, USA; Debjyoti Banerjee, Texas A&M University, USA

## **Focused Session 3: Nanomaterials for Sensing Applications: Fundamental Material Designs to Device Integration**

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

## **Focused Session 4: Advanced Ceramic Materials and Processing for Photonics and Energy**

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

## **2nd Global Young Investigator Forum**

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

## **Engineering Ceramics Summit of the Americas**

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

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## Oral Presenters

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Bragg-Sitton, S.	31-Jan	8:00AM	Ponce DeLeon	53	Davis, M.J.	30-Jan	10:40AM	Coquina Salon E	40
Bragg-Sitton, S.M.	31-Jan	10:50AM	Ponce DeLeon	53	De Silva, P.	31-Jan	10:00AM	Coquina Salon A	53
Bredt, J.F.	30-Jan	3:40PM	Coquina Salon A	46	Deck, C.P.	1-Feb	9:30AM	Ponce DeLeon	62
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Cesarano, J.	30-Jan	1:30PM	Coquina Salon A	46	Eichler, J.	29-Jan	3:50PM	Coquina Salon A	34
Chaabane, N.	1-Feb	10:10AM	Ponce DeLeon	62	Eklund, P.	29-Jan	2:00PM	Coquina Salon F	35
					Elaldi, F.	31-Jan	10:20AM	Coquina Salon D	51
					Elangovan, S.	1-Feb	10:00AM	Coquina Salon H	60
					Eldridge, J.I.	29-Jan	8:00AM	Ponce DeLeon	27





## Oral Presenters

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Kim, S.	29-Jan	8:30AM	Ponce DeLeon	27	Low, J.	1-Feb	9:00AM	Coquina Salon A	63
Kim, S.	1-Feb	9:00AM	Coquina Salon E	61	Lu, L.	29-Jan	10:30AM	Coquina Salon G	28
Kim, W.	1-Feb	8:00AM	Ponce DeLeon	62	Lundberg, P.	30-Jan	8:30AM	Coquina Salon E	40
Kim, Y.	28-Jan	5:00PM	Coquina Salon A	25	Luo, J.	29-Jan	1:30PM	Oceanview	35
Kimitsuka, Y.	29-Jan	11:40AM	Coquina Salon C	30	Luscombe, C.	1-Feb	10:30AM	Oceanview	63
Kimura, H.	31-Jan	4:00PM	Coquina Salon F	58	<b>M</b>				
King, D.	30-Jan	3:20PM	Coquina Salon E	44	Ma, P.X.	31-Jan	2:30PM	Coquina Salon C	56
King, D.	31-Jan	2:00PM	Coquina Salon F	58	Mader, W.	30-Jan	9:50AM	Coquina Salon B	41
Kirihara, S.	30-Jan	3:20PM	Coquina Salon A	46	Madsen, L.D.	1-Feb	8:00AM	Oceanview	63
Kirihara, S.	30-Jan	9:00AM	Ponce DeLeon	39	Magnuson, M.	29-Jan	5:20PM	Coquina Salon F	36
Kita, K.	29-Jan	2:40PM	Coquina Salon A	34	Mahjoubi, H.	1-Feb	10:20AM	Coquina Salon C	61
Kitazawa, R.	31-Jan	4:50PM	Coquina Salon D	55	Mahmoodian, R.	29-Jan	4:50PM	Coquina Salon A	34
Klatt, E.	30-Jan	1:50PM	Coquina Salon D	43	Mallik, P.K.	1-Feb	8:00AM	Coquina Salon C	61
Knipe, K.	28-Jan	5:10PM	Coquina Salon D	22	Mandal, D.	31-Jan	4:50PM	Ponce DeLeon	59
Kondo, S.	1-Feb	11:40AM	Ponce DeLeon	63	Mao, Y.	29-Jan	11:00AM	Coquina Salon G	28
Kozo, N.	30-Jan	4:10PM	Coquina Salon D	44	Mathur, S.	31-Jan	3:40PM	Coquina Salon E	57
Krause, T.	29-Jan	8:00AM	Coquina Salon F	31	Matyas, J.	31-Jan	4:10PM	Ponce DeLeon	58
Krenkel, W.	29-Jan	1:30PM	Coquina Salon A	34	Mauchamp, V.	29-Jan	4:40PM	Coquina Salon F	36
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Kupwade-Patil, K.	1-Feb	11:30AM	Coquina Salon A	63	Medvedovski, E.	31-Jan	2:30PM	Coquina Salon G	60
Kushi, T.	1-Feb	8:40AM	Coquina Salon H	60	Mera, G.	28-Jan	4:10PM	Coquina Salon B	24
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Lai, B.J.	1-Feb	8:30AM	Coquina Salon F	62	Miguel, F.L.	28-Jan	4:10PM	Coquina Salon F	26
Lamberson, L.E.	30-Jan	1:20PM	Coquina Salon E	44	Mikjelj, B.	1-Feb	11:00AM	Coquina Salon G	64
Lamon, J.L.	30-Jan	8:40AM	Coquina Salon D	39	Miller, S.M.	29-Jan	2:20PM	Coquina Salon C	34
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Lance, M.J.	29-Jan	4:30PM	Coquina Salon C	35	Miller-Oana, M.	31-Jan	9:10AM	Coquina Salon F	52
Larimore, Z.J.	30-Jan	4:40PM	Coquina Salon A	46	Mitic, V.	29-Jan	9:00AM	Coquina Salon A	29
LaSalvia, J.C.	30-Jan	10:20AM	Coquina Salon E	40	Mitra, S.	28-Jan	3:30PM	Coquina Salon G	24
Lawson, J.W.	30-Jan	1:30PM	Oceanview	46	Miyamoto, Y.	29-Jan	9:20AM	Coquina Salon A	29
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Leclercq, G.	31-Jan	2:50PM	Coquina Salon D	55	Montague, W.	1-Feb	11:00AM	Ponce DeLeon	62
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Lee, M.	29-Jan	10:00AM	Coquina Salon H	27	Morandotti, R.	31-Jan	10:00AM	Oceanview	54
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Lee, S.	28-Jan	1:30PM	Coquina Salon G	23	Muccillo, R.	31-Jan	3:20PM	Coquina Salon G	60
Legare, F.	31-Jan	8:00AM	Oceanview	54	Mudring, A.	28-Jan	2:00PM	Coquina Salon B	24
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Nakamura, A.	30-Jan	8:30AM	Oceanview	42	Quinn, G.	28-Jan	2:50PM	Coquina Salon D	22
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Ojha, K.	30-Jan	5:00PM	Ocean Center	49	Standring, T.	29-Jan	5:30PM	Ocean Center	38
Ortega, F.S.	29-Jan	5:30PM	Ocean Center	38	Sturzenegger, P.N.	29-Jan	5:30PM	Ocean Center	38
Park, J.	30-Jan	5:00PM	Ocean Center	49	Sun, J.	30-Jan	5:00PM	Ocean Center	49
Parsard, G.	29-Jan	5:30PM	Ocean Center	37	Suzuki, H.	29-Jan	5:30PM	Ocean Center	37
Pittari, J.J.	29-Jan	5:30PM	Ocean Center	37	Templeton, J.W.	30-Jan	5:00PM	Ocean Center	48
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Pyeon, M.	30-Jan	5:00PM	Ocean Center	50	Trachet, A.	29-Jan	5:30PM	Ocean Center	37
Qin, Y.	29-Jan	5:30PM	Ocean Center	37	Turan, D.	29-Jan	5:30PM	Ocean Center	36
Rani, J.	29-Jan	5:30PM	Ocean Center	36	Utsunomiya, H.	30-Jan	5:00PM	Ocean Center	50
Rocha, E.	30-Jan	5:00PM	Ocean Center	50	Vaseem, M.	30-Jan	5:00PM	Ocean Center	49
Rüscher, C.H.	30-Jan	5:00PM	Ocean Center	48	Vestli, M.	30-Jan	5:00PM	Ocean Center	48
Saba, M.	29-Jan	5:30PM	Ocean Center	38	Villas-Bóas, L.A.	30-Jan	5:00PM	Ocean Center	48
Salamone, S.	29-Jan	5:30PM	Ocean Center	36	Wade, J.	30-Jan	5:00PM	Ocean Center	49
Santiago, D.	30-Jan	5:00PM	Ocean Center	49	Wang, B.	29-Jan	5:30PM	Ocean Center	38
Sarnowska, M.	30-Jan	5:00PM	Ocean Center	49	Wang, J.	30-Jan	5:00PM	Ocean Center	50
Sedghi, A.	30-Jan	5:00PM	Ocean Center	49	Warner, E.	29-Jan	5:30PM	Ocean Center	37
Sglavo, V.M.	30-Jan	5:00PM	Ocean Center	49	Williams, T.	29-Jan	5:30PM	Ocean Center	37
Shahbazmohamadi, S.	29-Jan	5:30PM	Ocean Center	37	Wright, J.	29-Jan	5:30PM	Ocean Center	37
Shih, C.	30-Jan	5:00PM	Ocean Center	50	Xie, Z.	29-Jan	5:30PM	Ocean Center	38
Sondhi, A.	30-Jan	5:00PM	Ocean Center	50	Yamazoe, M.	29-Jan	5:30PM	Ocean Center	37
Song, J.	30-Jan	5:00PM	Ocean Center	50	Zhao, T.	30-Jan	5:00PM	Ocean Center	49
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## Monday, January 28, 2013

## Plenary Session

Room: Coquina Salon D

8:30 AM

## Opening Remarks

Sanjay Mathur, Division Chair; Sujanto Widjaja, 2013 Program Chair

9:00 AM

**(ICACC-PL-001-2013) Failure of Ceramics under Externally Applied Loads and Internally Generated Pressures: Zirconia, a Unique Material (Invited)**

A. Virkar\*, University of Utah, USA

9:40 AM

**(ICACC-PL-002-2013) Microstructural Evolution and Mechanical Properties of Engineering Ceramics (Invited)**

T. Ohji\*, National Institute of Advanced Industrial Science and Technology (AIST), Japan

10:20 AM

Break

10:40 AM

**(ICACC-PL-003-2013) Designing Ceramics for Electrochemical Energy Storage Devices (Invited)**

B. Dunn\*, University of California, USA

11:20 AM

**(ICACC-PL-004-2013) Novel materials development - What's next? The role of Root Industry Technology (Invited)**

S. Lee\*, Korea Institute of Industrial Technology, Republic of Korea

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

## Mechanics and Characterizations

Room: Coquina Salon D

Session Chairs: Rajan Tandon, Sandia National Lab; Pankaj Sarin, University of Illinois

1:30 PM

**(ICACC-S1-001-2013) Measuring and understanding the fracture toughness in ceramics at the microstructural scale using microcantilever beams**

A. D. Norton\*, R. I. Todd, University of Oxford, United Kingdom

1:50 PM

**(ICACC-S1-002-2013) Mesoscale Brittle Mechanical Testing Using Theta Specimens**

B. Babcox\*, M. Frecker, G. A. Lesieutre, J. H. Adair, Pennsylvania State University, USA

2:10 PM

**(ICACC-S1-003-2013) Torsion tests on brittle and tough joining materials**

M. Ferraris\*, M. Salvo, A. Ventrella, Politecnico di Torino, Italy

2:30 PM

**(ICACC-S1-004-2013) Role of Circumferential Cracking in Fracture from Cylindrical Inclusions in: LTCC-Gold via System**

R. Tandon\*, Sandia National Lab, USA

2:50 PM

**(ICACC-S1-006-2013) Edge Chip Fracture Resistance of Ceramic and Composite Materials**

G. Quinn\*, A. Giuseppetti, K. Hoffman, J. Quinn, American Dental Association Foundation, USA

3:10 PM

Break

3:30 PM

**(ICACC-S1-007-2013) Heat diffusivity measurements on ceramic foams and fibers with a laser spot and an IR camera**

G. L. Vignoles\*, University Bordeaux, France; C. Lorgette, CEA, France; G. Bresson, R. Backov, University Bordeaux, France

3:50 PM

**(ICACC-S1-008-2013) Effect of Calcium-Magnesium-Alumina-Silicate on Strain within the TGO Layer of Thermal Barrier Coatings**

S. Siddiqui\*, S. Scott, M. Ewen, K. Knipe, A. Manero, University of Central Florida, USA; J. Okasinski, J. Almer, Argonne National Laboratory, USA; L. Li, A. Feuerstein, Praxair Surface Technologies, USA; S. Raghavan, University of Central Florida, USA

4:10 PM

**(ICACC-S1-009-2013) Phase Transformations in  $YTaO_4$  and the Effect of Zr-ion Doping**

P. Sarin\*, Z. D. Apostolov, D. R. Lowry, W. M. Kriven, University of Illinois at Urbana-Champaign, USA; S. Shian, D. R. Clarke, Harvard University, USA

4:30 PM

**(ICACC-S1-010-2013) Neutron Scattering of Ferroelastic Mixed Ionic Electronic Conducting  $LaCoO_3$  based Perovskite Under In-Situ Uniaxial Compression**

N. Orlovskaya\*, Y. Chen, University of Central Florida, USA; D. Ma, A. Stoica, K. An, Oak Ridge National Laboratory, USA

4:50 PM

**(ICACC-S1-011-2013) Characterization of structural behavior under re-entry type transformations in  $Ln_6WO_{12}$  ( $Ln = Y, Ho, Er, Yb$ )**

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

5:10 PM

**(ICACC-S1-012-2013) Acquisition Techniques for Synchrotron X-Ray Strain Measurements in Tubular TBC Specimens for Thermal Gradient Mechanical Testing**

K. Knipe\*, A. Manero, S. Das, S. Siddiqui, S. Scott, M. Ewen, University of Central Florida, USA; C. Meid, J. Schneider, DLR Aerospace, Germany; J. Okasinski, J. Almer, Argonne National Laboratory, USA; M. Bartsch, DLR Aerospace, Germany; S. Raghavan, University of Central Florida, USA

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

## Environmental Barrier Coatings

Room: Ponce DeLeon

Session Chairs: Kang Lee, Rolls-Royce Corporation; Yiguang Wang, Northwestern Polytechnical University

1:30 PM

**(ICACC-S2-001-2013) Environmental Barrier coatings for Ceramic Matrix Composites (Invited)**

K. N. Lee\*, Rolls-Royce Corporation, USA

2:00 PM

**(ICACC-S2-002-2013) Progress in EBC Development for Silicon-based, Non-oxide Ceramics**

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

2:20 PM

**(ICACC-S2-004-2013) The Influence of Ca-Mg-Al Silicates on Stresses and Phase Transformations in Yb-Silicate Environmental Barrier Coatings**

F. Stolzenburg\*, Northwestern University, USA; J. Almer, Argonne National Lab, USA; K. N. Lee, Rolls Royce Corporation, USA; B. J. Harder, NASA Glenn Research Center, USA; K. T. Faber, Northwestern University, USA

2:40 PM

**(ICACC-S2-005-2013) The stability of rare-earth silicates in water-vapor environments (Invited)**

Y. Wang\*, Northwestern Polytechnical University, China

**3:10 PM**

**Break**

**3:30 PM**

**(ICACC-S2-006-2013) Single Crystal TiO<sub>2</sub> recession in high temperature water vapor**

R. A. Golden\*, University of Virginia, USA; X. Liu, University of Virginia, USA; J. Valentine, University of Virginia, USA; E. J. Opila, University of Virginia, USA

**3:50 PM**

**(ICACC-S2-007-2013) Plasma Spray – Physical Vapor Deposition of High Temperature Environmental Barrier Coatings for Turbine Blades**

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

**4:10 PM**

**(ICACC-S2-008-2013) Thermal Expansion and Phase Transitions of Rare Earth Disilicates and Monosilicates**

T. S. Key\*, E. E. Boakye, K. F. Presley, R. S. Hay, UES & AFRL/RXCC, USA

**4:30 PM**

**(ICACC-S2-009-2013) Electrochemical Synthesis of Carbide Derived Carbon – A Novel Air Filter for Volatile Organic Compounds (VOCs)**

S. Jaganathan\*, W. Chih-Chiang, T. Wen-Ta, National Cheng Kung University, Taiwan; G. Yuri, A. J. Drexel Nanotechnology Institute, Drexel University, USA; Y. Masahiro, National Cheng Kung University, Taiwan

**4:50 PM**

**(ICACC-S2-010-2013) Fabrication of slurry based Y-Si-Al-O environmental barrier coating on the porous Si<sub>3</sub>N<sub>4</sub>**

Y. Liu, C. Wang, H. Wang\*, State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, China

**5:10 PM**

**(ICACC-S2-011-2013) Effect of Cobalt Oxide on Willemite Crystalline Glazes at Moderate Temperature**

N. Sharma\*, N.A.S. (P.G.)College, India; L. K. Sharma, Central Glass and Ceramic Research Institute, India; H. Kaur, N.A.S. (P.G.)College, India

## **S4: Armor Ceramics**

### **Transparent Ceramics & Glasses**

Room: Coquina Salon E

Session Chairs: Parimal Patel, U.S. Army Research Laboratory; Jane Adams, U.S. Army Research Laboratory

**1:30 PM**

**(ICACC-S4-001-2013) Mechanical Behaviors and Structure of Glass (Invited)**

S. Ito\*, Tokyo Institute of Technology, Japan

**2:00 PM**

**(ICACC-S4-002-2013) Structure and Properties of Densified Glasses (Invited)**

L. Huang\*, Rensselaer Polytechnic Institute, USA

**2:30 PM**

**(ICACC-S4-003-2013) MD Simulations of Structure and Mechanical Properties of Silica Glasses (Invited)**

A. Cormack\*, L. Adkins, Alfred University, USA

**3:00 PM**

**Break**

**3:20 PM**

**(ICACC-S4-004-2013) Glass: A Highly Tunable and Versatile Material for Armor Applications**

M. J. Davis\*, SCHOTT North America, Inc., USA

**3:40 PM**

**(ICACC-S4-006-2013) Responses of Siliceous Materials to High Pressures**

A. Wereszczak\*, T. Morrissey, M. Ferber, Oak Ridge National Laboratory, USA; K. Bortle, E. Rodgers, ORISE, USA; Y. Vohra, University of Alabama - Birmingham, USA

**4:00 PM**

**(ICACC-S4-007-2013) Damage Mechanisms of Chemically Strengthened Glass Bars Due to High-Velocity Ball Impact**

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

**4:20 PM**

**(ICACC-S4-008-2013) Modeling Multiple Impacts onto Glass Targets**

T. Holmquist\*, Southwest Research Institute, USA

**4:40 PM**

**(ICACC-S4-009-2013) Brittle fracture evolution in projectile impact on a glass laminate: comparison between experiments and peridynamics results**

F. Bobaru\*, W. Hu, University of Nebraska-Lincoln, USA; J. Yu, C. Yen, ARL, USA

**5:00 PM**

**(ICACC-S4-010-2013) Multiscale Modeling of Non-crystalline Ceramics (Glass)**

G. A. Gazonas\*, J. W. McCauley, P. Patel, U.S. Army Research Laboratory, USA

**5:20 PM**

**(ICACC-S4-011-2013) Quantum mechanical modeling of structure and elastic properties of AION**

I. G. Batyrev\*, D. E. Taylor, J. W. McCauley, G. A. Gazonas, N. S. Weingarten, B. M. Rice, US Army Research Laboratory, USA

## **S6: Advanced Materials and Technologies for Energy Generation and Rechargeable Energy Storage**

### **Li-ion Battery Technology - Advanced Electrodes**

Room: Coquina Salon G

Session Chairs: Michelle Johannes, Naval Research Laboratory; Kiyoshi Kanamura, Tokyo Metropolitan University; Ilias Belharouak, Argonne National Laboratory

**1:30 PM**

**(ICACC-S6-001-2013) All Solid State Batteries for High Energy Applications (Invited)**

S. Lee\*, T. Yersak, A. MacPherson, University of Colorado, USA; S. Kim, K. Oh, Seoul National University, Republic of Korea; C. Stoldt, University of Colorado, USA

**2:00 PM**

**(ICACC-S6-002-2013) Two Dimensional Transition Metal Carbides and Carbonitrides (MXenes) Anodes for Lithium Ion Batteries and Lithium Ion Capacitors**

M. Naguib\*, Drexel University, USA; J. Come, Université Paul Sabatier, France; Y. Dallagnese, O. Mashtalir, Drexel University, USA; P. Taberna, P. Simon, Université Paul Sabatier, France; M. W. Barsoum, Y. Gogotsi, Drexel University, USA

**2:20 PM**

**(ICACC-S6-003-2013) Preparation and Property of Li<sub>2</sub>MSiO<sub>4</sub>/Graphene Cathode Materials**

Y. Cen, Y. Yao, Worcester Polytechnic Institute, USA; C. Wang, Qingdao University of Science and Technology, China; R. D. Sisson\*, J. Liang, Worcester Polytechnic Institute, USA

**2:40 PM**

**(ICACC-S6-005-2013) Ion Beam Mixing to Improve Ge Thin Film Li Ion Battery Anodes (Invited)**

K. S. Jones\*, N. Rudawski, R. G. Elliman, University of Florida, USA

**3:10 PM**

**Break**

**3:30 PM****(ICACC-S6-006-2013) Lithium-ion storage- Advanced High Rate and Energy anode materials (Invited)**

S. Mitra\*, U. Sen, A. Tripathi, P. Veluri, Indian Institute of Technology Bombay, India

**4:00 PM****(ICACC-S6-008-2013) Synthesis and characterization of olivine-type LiFePO<sub>4</sub> cathode material prepared by a polymeric steric entrapment precursor route**

D. Ribero\*, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**4:20 PM****(ICACC-S6-007-2013) Potential meso-structured Li (Mn<sub>0.9</sub>Fe<sub>0.05</sub>Mg<sub>0.05</sub>)PO<sub>4</sub>/C cathode material for high rate energy storage application**

V. Ramar\*, P. Balaya, NUS, Singapore

**4:40 PM****(ICACC-S6-004-2013) Decoration of Graphene with Sn Nanoparticles through Surface Functionalization using Diazonium Chemistry for Lithium-ion Battery Application**

G. Zeb\*, P. Gaskell, McGill University, Canada; X. Xiao, General Motors, USA; T. Szkopek, M. Cerruti, McGill University, Canada

**S7: 7th International Symposium on Nanostructured Materials and Nanocomposites****Synthesis and Applications of Functional Nanostructures I**

Room: Coquina Salon B

Session Chair: Sanjay Mathur, University of Cologne

**1:30 PM****(ICACC-S7-001-2013) Nanostructured ceramics: Processing, characterisation and commercialisation (Invited)**

J. Binner\*, B. Vaidhyanathan, C. Reilly, S. Saremi, M. Tong, Y. Zhang, S. Ghanizadeh, S. Huang, P. Ramanujam, S. Venugopal, P. Zhang, Loughborough University, United Kingdom

**2:00 PM****(ICACC-S7-002-2013) Phase-selective synthesis of rare earth phosphors at the nanoscale from ionic liquids (Invited)**

A. Mudring\*, Ruhr-Universitaet Bochum, Germany

**2:30 PM****(ICACC-S7-003-2013) Zinc oxide particles: The growth and characterization (Invited)**

Z. Crnjak Orel\*, National Institute of Chemistry, Slovenia

**3:00 PM**

Break

**Synthesis and Applications of Functional Nanostructures II**

Room: Coquina Salon B

Session Chairs: Anja-Verena Mudring, Ruhr-Universitaet Bochum; K. Byrappa, University of Mysore

**3:20 PM****(ICACC-S7-004-2013) Tuning of Bandgap and Nanoporosity in Hydrothermally Prepared Metal Oxide Semiconductors using Positron Annihilation Lifetime Spectroscopy (Invited)**

K. Byrappa\*, University of Mysore, India; K. Namratha, C. Ranganathaiah, University with Potential for Excellence Building, India

**3:50 PM****(ICACC-S7-005-2013) Effect of grain size on the thermal conductivity of La-doped SrTiO<sub>3</sub> nanoceramics**

V. Buscaglia\*, M. Buscaglia, National Research Council, Italy; F. Maglia, U. Anselmi Tamburini, University of Pavia, Italy; D. Marrè, University of Genoa, Italy; I. Pallecchi, National Research Council, Italy; A. Ianculescu, Polytechnics University of Bucharest, Romania; M. Fabrizio, National Research Council, Italy

**4:10 PM****(ICACC-S7-006-2013) Polymer-Derived Ceramics - Nanodomain Structure and Energetics**

G. Mera\*, Technische Universität Darmstadt, Germany; A. Navrotsky, University of California at Davis, USA; H. Kleebe, Technische Universität Darmstadt, Germany; S. Sen, University of California at Davis, USA; R. Riedel, Technische Universität Darmstadt, Germany

**4:30 PM****(ICACC-S7-010-2013) Water Vapor Facilitated Synthesis of Single-Crystal Platinum Nanoparticles**

T. Cheng\*, K. L. More, Oak Ridge National Lab, USA

**4:50 PM****(ICACC-S7-007-2013) Novel Synthesis and Analysis of Ce-doped TiO<sub>2</sub> Nanotubes**

P. N. Lisboa-Filho\*, UNESP-São Paulo State University, Brazil; L. B. Arruda, UNESP - São Paulo State University, Brazil

**S8: 7th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT)****Novel Processing for Functional Materials**

Room: Coquina Salon A

Session Chairs: Ian Nettleship, University of Pittsburgh; Paul Bowen, EPFL

**1:30 PM****(ICACC-S8-001-2013) Fundamental Issues in the Processing of Transparent Aluminas : From Interparticle Forces to Porous Ceramic Coatings and Dense Transparent Ceramics (Invited)**

P. Bowen\*, EPFL, Switzerland

**2:00 PM****(ICACC-S8-002-2013) UBE's Functional Ceramics Synthesized from Bountiful Resources (Invited)**

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

**2:30 PM****(ICACC-S8-003-2013) What the difference between Aerosol Deposition and Cold Spray techniques as the kinetic spray coating? (Invited)**

J. Akeo\*, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**3:00 PM**

Break

**3:20 PM****(ICACC-S8-004-2013) High Efficiency Low Temperature Recycling Technology for Lithium Ion Batteries (Invited)**

Y. Wang\*, H. Zou, D. Apelian, Worcester Polytechnic Institute, USA

**3:50 PM****(ICACC-S8-005-2013) Processing and Characterization of Multiferroic Composite Films Using Metal-Organic Precursor Solutions (Invited)**

W. Sakamoto\*, Y. Kawabata, D. Maeda, M. Moriya, T. Yogo, Nagoya University, Japan

**4:20 PM****(ICACC-S8-006-2013) The Design and Processing of Bioreactor Ceramics for In-Vitro Culturing of Human Cells**

I. Nettleship\*, A. Finoli, E. Schmelzer, J. Gerlach, University of Pittsburgh, USA



**4:40 PM****(ICACC-S8-007-2013) Novel approach to produce spherical, porous, multilayer and hollow ceramic beads**

C. J. Espinoza Santos\*, B. Walusiak, S. Hayes, E. K. Mendoza, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**5:00 PM****(ICACC-S8-008-2013) Effect of Additives on Electrical Resistivity of Liquid-Phase Sintered Silicon Carbide Ceramics**

Y. Kim\*, K. Lim, The UNiversity of Seoul, Republic of Korea; K. Kim, Konkuk University, Republic of Korea

**S9: Porous Ceramics: Novel Developments and Applications****Processing Methods for Porous Ceramics I**

Room: Coquina Salon C

Session Chair: Paolo Colombo, University of Padova

**1:30 PM****(ICACC-S9-001-2013) Particle-stabilized ceramic foams: from discovery to invention to innovation (Invited)**

U. T. Gonzenbach\*, de Cavis Ltd., Switzerland; P. N. Sturzenegger, B. S. Seeber, ETH Zürich, Switzerland; U. Ebner, de Cavis Ltd., Switzerland; P. Elser, M. Heer, L. J. Gauckler, ETH Zürich, Switzerland

**2:00 PM****(ICACC-S9-002-2013) Development of highly closed porous ceramics for thermal insulator**

M. Fukushima\*, Y. Yoshizawa, National Institute of AIST, Japan

**2:20 PM****(ICACC-S9-003-2013) High Performance Porous Si<sub>3</sub>N<sub>4</sub> Ceramics with Microstructural Design (Invited)**

J. Yang\*, Xi'an Jiaotong University, China

**2:50 PM**

Break

**Processing Methods for Porous Ceramics II**

Room: Coquina Salon C

Session Chair: Alberto Ortona, SUPSI

**3:20 PM****(ICACC-S9-004-2013) Foaming methods for the production of porous ceramics based on ZrB<sub>2</sub> and SiC (Invited)**

V. Medri\*, M. Mazzocchi, A. Ruffini, D. Sciti, E. Landi, CNR-ISTEC, Italy

**3:50 PM****(ICACC-S9-005-2013) Formation mechanism of porous zirconia with a high volume fraction of fine closed pores**

S. Hashimoto\*, T. Umeda, Nagoya Institute of Technology, Japan; K. Hirao, N. Kondo, Y. Zhou, H. Hyuga, National Institute of Advanced Industrial Science and Technology (AIST), Japan; S. Honda, Y. Iwamoto, Nagoya Institute of Technology, Japan

**4:10 PM****(ICACC-S9-006-2013) Fabrication and filtration behavior of ceramic foams decorated with ceramic nanowires**

M. Fukushima\*, National Institute of AIST, Japan; M. Innocentini, Universidade de Ribeirão Preto, Brazil; J. Coury, Universidade Federal de São Carlos, Brazil; Y. Yoshizawa, National Institute of AIST, Japan; P. Colombo, Università di Padova, Italy

**4:30 PM****(ICACC-S9-007-2013) Possible Mechanisms to Wet Foam Stabilization Forming Porous Ceramics**

A. Pokhrel\*, S. Nam, I. Kim, Hanseo University, Republic of Korea

**4:50 PM****(ICACC-S9-008-2013) Silicon Oxycarbide Foams from Silicone Precursors**

H. Chen\*, T. Parthasarathy, M. Cinibulk, M. Chen, AFRL, USA

**5:10 PM****(ICACC-S9-009-2013) The Synthesis of Mesoporous SiC Ceramics from Block Copolymer Precursors**

X. Yang\*, L. An, University of Central Florida, USA

**5:30 PM****(ICACC-S9-010-2013) Superparamagnetic single phase cubic mesoporous CuFe<sub>2</sub>O<sub>4</sub> synthesized by nanocasting from vinyl-functionalized Cubic mesoporous silica**

N. Najmoddin, M. S. Toprak\*, KTH - Royal Institute of Technology, Sweden; A. Beitollahi, H. Rezaie, IUST - Iran University of Science and Technology, Islamic Republic of Iran; M. Muhammed, KTH - Royal Institute of Technology, Sweden

**FS2: Thermal Management Materials and Technologies****Thermal Management Materials and Technologies**

Room: Coquina Salon H

Session Chair: Andrew Gyekenyesi, OAI/NASA GRC

**1:30 PM****(ICACC-FS2-001-2013) Evaluation of Graphite Foam in Thermal Energy Storage Applications**

P. G. Stansberry\*, E. Pancost, GrafTech International Holdings, USA

**1:50 PM****(ICACC-FS2-002-2013) Joining and Characterization of Graphite Foam-to-Metal Joints**

M. Singh, R. Asthana\*, C. E. Smith, A. L. Gyekenyesi, University of Wisconsin-Stout, USA

**2:10 PM****(ICACC-FS2-003-2013) High-Temperature Foam-Reinforced Thermal Insulation**

J. J. Stiglich\*, B. Williams, Ultramet, USA

**FS3: Nanomaterials for Sensing Applications: Fundamental Material Designs to Device Integration****Nanomaterials for Sensing Applications**

Room: Coquina Salon H

Session Chair: Francisco Hernandez-Ramirez, Catalonia Institute for Energy Research and University of Barcelona

**3:20 PM****(ICACC-FS3-001-2013) The surface chemistry effects on the gas response of metal oxide nanocrystals. A combined experimental and theoretical investigation (Invited)**

M. Epifani\*, CNR-IMM, Italy

**3:50 PM****(ICACC-FS3-002-2013) New nanostructured SiOC aerogels for gas sensing applications**

G. Soraru\*, University of Trento, Italy; A. Parakkulam Ramaswamy, German Aerospace Research Centre [DLR], Germany; A. Karakuscu, A. Ponzoni, E. Comini, G. Faglia, G. Sberveglieri, University of Brescia, Italy

**4:10 PM****(ICACC-FS3-003-2013) Synthesis, Dispersion and Functionalization of SiO<sub>2</sub> Nanowires for Biosensing Applications**

P. Sekhar\*, H. Sarraf, H. Mekonen, Washington State University Vancouver, USA

**4:30 PM****(ICACC-FS3-005-2013) A Novel Platform of Solar-Driven Self-Powered Gas Sensors**

A. A. Gad\*, M. Hoffmann, Chair of Inorganic Chemistry, Germany; J. Prades, University of Barcelona, Spain; F. Hernandez-Ramirez, Catalonia Institute for Energy Research (IREC), Spain; H. Shen, S. Mathur, Chair of Inorganic Chemistry, Germany

**4:50 PM****(ICACC-FS3-006-2013) Development of single-, few- and multiple-nanowire gas-FET devices on ceramic substrates**

B. W. Mwakikunga\*, Council for Scientific and Industrial Research, South Africa; T. Singh, I. Giebelhaus, T. Fischer, A. Lepcha, A. E. Gad, S. Mathur, University of Cologne, Germany

**5:10 PM****(ICACC-FS3-007-2013) Synthesis and Structural Studies of Some Lanthanide Complexes of Mesogenic Schiff-base, N,N'-di-(4'-octadecyloxybenzoate)salicylidene-1'',3''-diamino-2''-propanol**

S. Singh\*, Banaras Hindu University, India

**5:30 PM****(ICACC-FS3-004-2013) Polymer derived ceramic sensors for ultra-high temperature application**

G. Shao\*, University of Central Florida, USA; D. Freese, R. Gongora, C. Xu, University of central florida, USA; L. An, University of Central Florida, USA

**2nd Global Young Investigators Forum****Applications: Ceramic Sensors and Actuators, Energy Generation and Storage, Photocatalysis I**

Room: Coquina Salon F

Session Chairs: Thomas Fischer, University of Cologne; Fernando Torres Andon, Karolinska Institutet

**1:30 PM****(ICACC-GYIF-001-2013) Energetics of  $\text{La}_{9.33+x}(\text{SiO}_4)_6\text{O}_{2+3x/2}$ : Solid Oxide Fuel Cell Electrolyte Materials**

S. Hosseini\*, A. Navrotsky, UC Davis, USA

**1:50 PM****(ICACC-GYIF-002-2013) Grain Boundary Electrical Properties of Ionic Conductors Based on Solid Solutions of Nd, Ga and Ge Oxides**

H. J. Avila-Paredes\*, H. Chávez-Cárdenas, A. Deolarte-Carreón, Universidad Autónoma Metropolitana Unidad Iztapalapa, Mexico

**2:10 PM****(ICACC-GYIF-003-2013) Carbon/Metal Oxide Nanocomposites as Electrode Materials for Lithium-Ion Batteries**

R. Mueller\*, S. Mathur, M. Büyükyazi, A. Lepcha, University of Cologne, Germany

**2:30 PM****(ICACC-GYIF-004-2013) Synthesis of 1D-Nanostructures  $\text{LiFeO}_2/\text{C}$  and  $\text{Fe-Fe}_3\text{O}_4/\text{C}$  as Anode Materials and their Electrochemical Measurements in Lithium-Ion Batteries**

M. Büyükyazi\*, R. von Hagen, S. Mathur, University of Cologne, Germany

**2:50 PM****(ICACC-GYIF-005-2013) Modification of the electric properties in carbonaceous materials by deposition of  $\text{SnO}_2$  nanowires via CVD**

A. Gutierrez-Pardo, University of Seville, Spain; R. Fiz\*, S. Mathur, University of Cologne, Germany; J. Ramirez-Rico, University of Seville, Spain, Spain

**3:10 PM****Break****Applications: Ceramic Sensors and Actuators, Energy Generation and Storage, Photocatalysis II**

Room: Coquina Salon F

Session Chairs: Seyedeh Mahboobeh Hosseini, UC Davis; Ralf Mueller, University of Cologne

**3:30 PM****(ICACC-GYIF-006-2013) Nanochemistry: The gigantic growth of a dwarf**

T. Fischer\*, S. Mathur, University of Cologne, Germany

**3:50 PM****(ICACC-GYIF-007-2013) Metal oxide/semiconductor decorated multilayer Graphene oxide: photocatalysis and electrocatalysis**

K. Ojha\*, P. K. Chowdhury, A. K. Ganguli, Indian Institute of Technology, Delhi, India

**4:10 PM****(ICACC-GYIF-008-2013) Production and characterization of nanocomposites consisting of electroless deposited Ag on semiconducting oxide nanostructures**

F. L. Miguel\*, F. Soldara, Saarland University, Germany; T. Fischer, R. Müller, S. Mathur, University of Cologne, Germany; F. Mücklich, Saarland University, Germany

**4:30 PM****(ICACC-GYIF-009-2013)  $\text{Nb}_2\text{O}_5$  Nanorods and  $\text{SnO}_2/\text{Nb}_2\text{O}_5$  Heterostructures as Humidity Sensors**

R. Fiz\*, Universität zu Köln, Germany; F. Hernandez-Ramirez, Catalonia Institute for Energy Research (IREC), Germany; T. Fischer, Universität zu Köln, Germany; L. Llopez-Conesa, S. Estrade, F. Peiro, University of Barcelona, Germany; S. Mathur, Universität zu Köln, Germany

**4:50 PM****(ICACC-GYIF-010-2013) Dielectric and Piezoelectric Properties of Sr and La co-doped PZT Ceramics**

V. Kalem\*, Selcuk University, Turkey; M. Timuçin, Middle East Technical University, Turkey

**5:10 PM****(ICACC-GYIF-011-2013)  $\text{ZnO}$ -quantum dots-polymer as hybrid nanocomposite for photovoltaics**

A. Sugunan\*, Y. Zhao, X. Yang, M. Toprak, M. Muhammed, Royal Institute of Technology (KTH), Sweden

**Tuesday, January 29, 2013****S1: Mechanical Behavior and Performance of Ceramics & Composites****Processing, Microstructure and Mechanical Properties Correlation I**

Room: Coquina Salon D

Session Chairs: Jon Salem, NASA Glenn Research Center; Yanchun Zhou, Aerospace Research Institute of Materials & Processing Technology

**8:00 AM****(ICACC-S1-013-2013) The effect of the addition of ceria stabilised zirconia on the creep of mullite**

D. Glymond\*, F. Giuliani, Imperial College London, United Kingdom; M. Vick, M. Pan, Naval Research Laboratory, USA; L. J. Vandepierre, Imperial College London, United Kingdom

**8:20 AM****(ICACC-S1-014-2013) Characterizations of  $\text{ZrO}_2$ -stabilized  $\text{YTaO}_4$ : Thermal conductivity and in-situ Raman micro-analysis**

S. Shian\*, M. Gurak, Harvard University, USA; P. Sarin, W. M. Kriven, University of Illinois at Urbana-Champaign, USA; D. R. Clarke, Harvard University, USA

**8:40 AM****(ICACC-S1-015-2013) Doping as a way to control microstructure and mechanical properties of  $\text{Al}_2\text{O}_3\text{-ZrO}_2$  composites**

L. Gremillard\*, K. Biotteau-Deheuvels, J. Chevalier, INSA, France

**9:00 AM****(ICACC-S1-016-2013) High-Temperature Creep Behavior of SiOC Polymer-Derived Ceramic Nanocomposites: Microstructural and Phase Composition Effects**

E. Ionescu\*, H. Kleebe, R. Riedel, Technische Universitaet Darmstadt, Germany

**9:20 AM****(ICACC-S1-017-2013) Processing, microstructure and creep behaviour of alumina-SiC micro-nanocomposites**

H. Reveron\*, M. Jaafar, C. Esnouf, G. Fantozzi, MATEIS Laboratory - Insa de Lyon, France

9:40 AM

Break

10:00 AM

**(ICACC-S1-018-2013) Pressure-Induced Transformation Toughening in 10 mol% Yttria Stabilized Zirconia- $\beta$ -eucryptite Composites**

S. Ramalingam\*, I. E. Reimanis, Colorado School of Mines, USA

10:20 AM

**(ICACC-S1-019-2013) Investigation into the effect of common ceramic core additives on the crystallisation and sintering of amorphous silica**

B. Taylor\*, Birmingham University, United Kingdom; S. Welch, Rolls Royce PLC, United Kingdom; S. Blackburn, Birmingham University, United Kingdom

10:40 AM

**(ICACC-S1-020-2013) Crack Propagation in Tooth Enamel is Regulated by Enamel Apatite Crystallographic Dimensions**

F. Tamimi\*, E. Ghadimi, H. Eimar, B. Marelli, S. Nazhat, H. Vali, McGill University, Canada

11:00 AM

**(ICACC-S1-021-2013) Processing and Mechanical Characterization of ZnO/Polyester Woven Carbon Fiber Composites**

H. Park\*, K. Kong, Ulsan National Institute of Science and Technology, Republic of Korea; H. Kim, LG Hausys R&amp;D Center, Republic of Korea

11:20 AM

**(ICACC-S1-022-2013) Solid-solution of nitrogen-containing rare earth aluminates R<sub>2</sub>AlO<sub>3</sub>N**

Y. Jiang\*, L. Wu, Y. Chen, W. Sun, Z. Huang, Beifang University of Nationalities, China

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

Room: Ponce DeLeon

Session Chairs: Ali Goodarzi, Amirkabir University; Seongwon Kim, Korea Institute of Ceramic Engineering and Technology

8:00 AM

**(ICACC-S2-012-2013) Luminescence-Based Diagnostics of Thermal Barrier Coating Health and Performance (Invited)**

J. I. Eldridge\*, NASA Glenn Research Center, USA

8:30 AM

**(ICACC-S2-013-2013) TEM Characterization of Zirconate-based Oxides for Thermal Barrier Coatings (TBCs) (Invited)**

S. Kim\*, S. Lee, Y. Oh, H. Kim, Korea Institute of Ceramic Engineering and Technology, Republic of Korea; B. Jang, National Institute of Materials Science, Japan

9:00 AM

**(ICACC-S2-014-2013) Multilayer Thermal Barrier Coatings: Interplay among coating design, processing and properties**

S. Sampath, G. Dwivedi, V. Viswanathan\*, Y. Chen, Stony Brook University, USA

9:20 AM

**(ICACC-S2-015-2013) Cycle Duration Effects on Thermal Barrier Coating Life- Experiments and Predictive Modeling**

E. Jordan, S. Ahmadian\*, C. Thistle, University of Connecticut, USA

9:40 AM

Break

10:00 AM

**(ICACC-S2-017-2013) Thermodynamics of ZrHf-mixed silicates for environmental barrier coatings for Tyranno-hex materials (Invited)**

A. Goodarzi\*, H. Taylor, Harvard University, USA

10:30 AM

**(ICACC-S2-018-2013) Microstructural and Phase Evolution in Yttria-Stabilized Zirconia Thermal Barrier Coatings Deposited via Plasma Spray-Physical Vapor Deposition (PS-PVD)**

M. P. Schmitt\*, The Pennsylvania State University, USA; B. J. Harder, D. Zhu, NASA Glenn Research Center, USA; D. E. Wolfe, The Pennsylvania State University, USA

10:50 AM

**(ICACC-S2-019-2013) New Chemistries with the Potential to form Novel High Fracture Toughness Thermal Barrier Coating Materials**

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

11:10 AM

**(ICACC-S2-020-2013) Mechanism of Mullite Formation By Aluminium Filler-Controlled Pyrolysis of Polymethylsiloxane**

J. Anggono\*, Petra Christian University, Indonesia; B. Derby, University of Manchester, United Kingdom

11:30 AM

**(ICACC-S2-016-2013) Comparison in Foreign Object Damage (FOD) between Air Plasma Sprayed and EB-PVD Thermal Barrier Coatings (TBCs) (Invited)**

D. Faucett, S. Lei, S. R. Choi\*, Naval Air Systems Command, USA

**S3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology****SOFC Applications**

Room: Coquina Salon H

Session Chairs: Narottam Bansal, NASA Glenn Research Center; N.Q. Minh, University of California, San Diego

8:00 AM

**(ICACC-S3-001-2013) Role of Solid Oxide Fuel Cells in a Balanced Energy Strategy (Invited)**

E. D. Wachsman\*, C. A. Marlowe, K. Lee, University of Maryland, USA

8:30 AM

**(ICACC-S3-002-2013) SECA Program Status (Invited)**

B. White, J. Stoffa\*, Dept. of Energy, USA

9:00 AM

**(ICACC-S3-003-2013) SOFC-system for high efficient power generation from biogas**

A. Lindermeir\*, R. Dietrich, J. Oelze, CUTEC Institut GmbH, Germany

9:20 AM

**(ICACC-S3-004-2013) Development of a portable propane driven 300 W SOFC-system**

C. Szepanski, A. Lindermeir\*, R. Dietrich, CUTEC Institut GmbH, Germany

9:40 AM

Break

10:00 AM

**(ICACC-S3-005-2013) Development and Application of SOFC-MEA Technology at INER (Invited)**

M. Lee\*, T. Lin, R. Lee, Institute of Nuclear Energy Research, Taiwan

10:30 AM

**(ICACC-S3-006-2013) Development of Solid Oxide Fuel Cell Stack Modules for High Efficiency Power Generation (Invited)**

H. Ghezal-Ayagh\*, FuelCell Energy, Inc., USA

11:00 AM

**(ICACC-S3-007-2013) Portable LPG-fueled microtubular SOFC (Invited)**

S. Kuehn\*, S. Kaeding, L. Winkler, eZelleron GmbH, Germany

**11:30 AM**

**(ICACC-S3-008-2013) Demonstration of a Highly Efficient SOFC Power System Using Adiabatic Steam Reforming and Anode Gas Recirculation (Invited)**

V. Sprenkle\*, M. Powell, K. Meinhardt, L. Chick, Pacific Northwest National Laboratory, USA

## S4: Armor Ceramics

### Brittle Materials Modeling

Room: Coquina Salon E

Session Chair: Brian Leavy, ARL

**8:00 AM**

**(ICACC-S4-012-2013) Multiscale Modeling of Brittle Fracture with Peridynamics (Invited)**

S. A. Silling\*, Sandia National Laboratories, USA

**8:30 AM**

**(ICACC-S4-013-2013) Constitutive and Adaptive Kinematic Modelling of Dynamic Fracture in Ceramic Armour**

N. Petrinic\*, S. Falco, E. Barbieri, S. Knell, E. López-López, University of Oxford, United Kingdom; T. Rodríguez Suarez, Universidad de Oviedo, Spain; R. I. Todd, University of Oxford, United Kingdom

**8:50 AM**

**(ICACC-S4-014-2013) 3D Mechanism-Based Modeling of the Failure of Brittle Materials under Dynamic Multiaxial Loading**

G. Hu\*, K. Ramesh, Johns Hopkins University, USA

**9:10 AM**

**(ICACC-S4-015-2013) Simulations of Edge-on Impact (EOI) using a micromechanics damage model**

A. L. Tonge\*, K. T. Ramesh, The Johns Hopkins University, USA

**9:30 AM**

**(ICACC-S4-016-2013) Current Numerical Efforts on Predicting the Ballistic Impact of W-Based Penetrators on Confined Hot-Pressed Boron Carbide Targets Behavior**

C. G. Fountzoulas\*, J. C. LaSalvia, WMRD, USA

**9:50 AM**

**Break**

## Materials in Extreme Dynamic Environments (MEDE)

Room: Coquina Salon E

Session Chair: James McCauley, U.S. Army Research Laboratory

**10:10 AM**

**Opening Remarks**

**10:20 AM**

**(ICACC-S4-017-2013) Materials in Extreme Dynamic Environments - A Collaborative Research Alliance(CRA) (Invited)**

J. H. Beatty\*, US Army Research Laboratory, USA; K. T. Ramesh, Johns Hopkins University, USA

**10:40 AM**

**(ICACC-S4-018-2013) Armor Ceramics in Extreme Dynamic Environments (Invited)**

K. T. Ramesh\*, Johns Hopkins Univ, USA

**11:10 AM**

**(ICACC-S4-019-2013) Materials in Extreme Dynamic Environments (MEDE)- The Opportunities for Boron Carbide as the Next Generation Armor Material (Invited)**

R. Haber\*, Rutgers University, USA

**11:40 AM**

**Panel Question & Answer Session**

## S6: Advanced Materials and Technologies for Energy Generation and Rechargeable Energy Storage

### Li-ion Battery Technology - Design and Interface

Room: Coquina Salon G

Session Chairs: Sehee Lee, University of Colorado; Kevin Jones, University of Florida

**8:00 AM**

**(ICACC-S6-011-2013) The research on all-solid-state battery with hole-array structure (Invited)**

K. Kanamura\*, T. Nishioka, S. Naoto, J. Wakasugi, R. Osone, H. Munakata, Tokyo Metropolitan University, Japan

**8:30 AM**

**(ICACC-S6-012-2013) Understanding Li diffusion and interface stability in garnet structured solid electrolyte materials (Invited)**

M. Johannes\*, Naval Research Laboratory, USA; K. Hoang, George Mason University, USA; N. Bernstein, Naval Research Laboratory, USA; J. Sakamoto, Michigan State University, USA

**9:00 AM**

**(ICACC-S6-013-2013) Tailoring Active Material and Electrode Design for High Capacity Battery Performance**

S. Hariharan\*, P. Balaya, National University of Singapore, Singapore

**9:20 AM**

**Break**

## Materials for Energy Storage - Supercapacitors

Room: Coquina Salon G

Session Chairs: Sehee Lee, University of Colorado; Kevin Jones, University of Florida

**10:00 AM**

**(ICACC-S6-015-2013) Carbide-Derived Carbon Films for Integrated Electrochemical Energy Storage (Invited)**

M. Heon, M. Beidaghi, Y. Gogotsi\*, Drexel University, USA

**10:30 AM**

**(ICACC-S6-016-2013) Nanostructured MnO<sub>2</sub>/composites for supercapacitors (Invited)**

L. Lu\*, National University of Singapore, Singapore

**11:00 AM**

**(ICACC-S6-017-2013) Metal oxide-carbon composite nanofibers with enhanced electrochemical energy storage performance (Invited)**

Y. Mao\*, Q. Li, University of Texas-Pan American, USA

**11:30 AM**

**(ICACC-S6-018-2013) Combined in-situ TEM-EELS and Synchrotron X-ray Techniques for Tracking Lithium Transport and Electrochemical Reactions (Invited)**

F. Wang\*, S. Kim, L. Wu, Y. Zhu, J. Graetz, Brookhaven National Laboratory, USA

## S7: 7th International Symposium on Nanostructured Materials and Nanocomposites

### Nanomaterials for Energy Applications I

Room: Coquina Salon B

Session Chairs: Vladimir Sivakov, Institute of Photonic Technology; Mark Hersam, Northwestern University

**8:00 AM**

**(ICACC-S7-011-2013) Piezoelectric Nanogenerators and Piezotronics for Energy and Optoelectronic Device Applications (Invited)**

S. Kim\*, Sungkyunkwan University, Republic of Korea

**8:30 AM**

**(ICACC-S7-012-2013) Oxide Nanowires for Opto-electronics**

G. Faglia\*, C. Baratto, E. Comini, I. Concina, M. Ferroni, A. Ponzoni, G. Vardan, D. Zappa, G. Sberveglieri, Università degli Studi di Brescia, Italy

**9:00 AM**

**(ICACC-S7-013-2013) Electrospinning of TiO<sub>2</sub> Nanofibers and Hydrogen Plasma Treatment for Solar Water Splitting**

A. Lepcha\*, A. P. Singh, A. Mettenbörger, S. Mathur, University of Cologne, Germany

**9:20 AM**

**(ICACC-S7-014-2013) Effect of Doping on In-Situ Crystallization and Crystal Growth in Electrospun TiO<sub>2</sub> Nanofibres**

H. Albetran, H. Haroosh, R. Dong, J. Low\*, Curtin University, Australia

**9:40 AM**

**Break**

### Nanomaterials for Energy Applications II

Room: Coquina Salon B

Session Chairs: Peter Notten, Eindhoven University of Technology; Guido Faglia, Università degli Studi di Brescia

**10:00 AM**

**(ICACC-S7-015-2013) Novel Discovery of Silicon (Invited)**

V. Sivakov\*, Institute of Photonic Technology, Germany

**10:30 AM**

**(ICACC-S7-016-2013) Design and integration of Q1D metal oxide heterostructures**

R. Fiz\*, S. Mathur, Universität zu Köln, Germany

**10:50 AM**

**(ICACC-S7-017-2013) Monodisperse Carbon Nanomaterial Coatings and Composites in Electronic and Energy Conversion Devices (Invited)**

M. C. Hersam\*, Northwestern University, USA

**11:20 AM**

**(ICACC-S7-018-2013) Microwave assisted synthesis of Graphene/Metal Oxide Nanocomposites for Lithium-Ion Battery Anodes**

R. Mueller\*, S. Mathur, University of Cologne, Germany

**11:40 AM**

**(ICACC-S7-019-2013) From materials research to integrated Li-ion micro-batteries (Invited)**

P. H. Notten\*, Eindhoven University of Technology, Netherlands

## S8: 7th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT)

### Advanced Composite Manufacturing

Room: Coquina Salon A

Session Chairs: Yury Gogotsi, Drexel University; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST)

**8:00 AM**

**(ICACC-S8-011-2013) Carbon nanotubes in silicon nitride (Invited)**

C. Balazsi\*, Hungarian Academy of Sciences, Hungary

**8:30 AM**

**(ICACC-S8-012-2013) Manufacturing and Properties of 2-Dimensional Carbides and Carbonitrides (MXenes) (Invited)**

M. Naguib, O. Mashtalir, M. Kurtoglu, M. W. Barsoum, Y. Gogotsi\*, Drexel University, USA

**9:00 AM**

**(ICACC-S8-013-2013) Fractals in Ceramic Structure and Properties Higher Integrations**

V. Mitic\*, V. Paunovic, University of Nis, Serbia; S. Jankovic, Mathematical institute, SASA, Serbia; L. Kocic, University of Nis, Serbia; V. Pavlovic, University of Belgrade, Serbia

**9:20 AM**

**(ICACC-S8-016-2013) Development and Applications of Ceramic Bonded Carbon Composites**

W. Chen, Y. Miyamoto\*, Joining and Welding Research Institute, Osaka University, Japan

**9:40 AM**

**Break**

**10:00 AM**

**(ICACC-S8-017-2013) Composite metal oxide particles from chemical vapor synthesis**

A. K. Sternig, A. Gheisi, O. Diwald\*, University of Erlangen Nürnberg, Germany; S. Klacar, H. Groenbeck, Chalmers University of Technology, Sweden

**10:20 AM**

**(ICACC-S8-018-2013) Fabrication and Properties of High Thermal Conductivity Silicon Nitride**

Y. Zhou, H. Hyuga, T. Ohji\*, K. Hirao, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**10:40 AM**

**(ICACC-S8-019-2013) Structure-Property Relationship of Polymer-Derived Amorphous SiBCN Ceramics**

Y. Chen\*, L. An, University of Central Florida, USA

**11:00 AM**

**(ICACC-S8-020-2013) Processing and properties of zirconia toughened WC-based cermets**

I. Hussainova\*, N. Voltsihhin, Tallinn University of Technology, Estonia; S. Hannula, E. Cura, Aalto University Foundation, Finland

**11:20 AM**

**(ICACC-S8-015-2013) Evaluation of High Fiber Volume Fraction Fiber Reinforced Polymer Composites Fabricated in an Out-of-Autoclave Resin Infusion Process**

L. R. Holmes\*, US Army Research Labs, USA

## S9: Porous Ceramics: Novel Developments and Applications

### Membranes and High SSA Ceramics

Room: Coquina Salon C

Session Chair: Gian Domenico Soraru, University of Trento

**8:00 AM**

**(ICACC-S9-011-2013) Structuring of Porous Powders into Hierarchically Porous Macroscopic Adsorbents for Gas separation (Invited)**

F. Akhtar\*, A. Ojuva, N. Keshavarzi, L. Bergström, Stockholm University, Sweden

**8:30 AM**

**(ICACC-S9-012-2013) Pore size control of amorphous silica membrane synthesized by chemical vapor deposition**

T. Nagano\*, K. Sato, Japan Fine Ceramics Center, Japan

**8:50 AM**

**(ICACC-S9-013-2013) Gas permeation properties of microporous amorphous silica-based membranes**

Y. Iwamoto\*, A. Mori, H. Mizuno, A. Kimura, K. Hataya, S. Honda, Graduate School of Engineering, Nagoya Institute of Technology, Japan

**9:10 AM**

**(ICACC-S9-014-2013) Permeability and Fracture Properties of Porous Alumina for Support Substrates of Ceramic Membranes**

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

**9:30 AM**

**(ICACC-S9-015-2013) Hydrogen permeation properties of sol-gel derived amorphous silica membranes fabricated at high temperatures**

M. Kanezashi\*, T. Sasaki, Hiroshima University, Japan; H. Tawarayama, Sumitomo Electric Industries Ltd, Japan; T. Yoshioka, T. Tsuru, Hiroshima University, Japan

**9:50 AM**

**Break**

### Processing Methods for Porous Ceramics III

Room: Coquina Salon C

Session Chair: Yuji Iwamoto, Graduate School of Engineering, Nagoya Institute of Technology

**10:10 AM**

**(ICACC-S9-016-2013) Microstructure evaluation and simulation of micro cellular ceramics (Invited)**

T. Fey\*, University of Erlangen-Nuremberg, Germany; P. Greil, University of Erlangen-Nuremberg, Germany; M. Stumpf, University of Erlangen-Nuremberg, Germany

**10:40 AM**

**(ICACC-S9-017-2013) Colloidal processing of advanced ceramics for applications in purification technology**

K. Rezwani\*, Advanced Ceramics, University of Bremen, Germany

**11:00 AM**

**(ICACC-S9-018-2013) SiC aerogels from preceramic polymers**

G. Soraru\*, E. Zera, R. Camprostrini, University of Trento, Italy; Y. Blum, SRI International, USA

**11:20 AM**

**(ICACC-S9-019-2013) Processing of microporous membranes for H<sub>2</sub>/CO<sub>2</sub> and CO<sub>2</sub>/N<sub>2</sub> separation**

T. Van Gestel\*, J. Hoffmann, J. Eiberger, M. Bram, W. Meulenber, H. Buchkremer, Forschungszentrum Jülich, Germany

**11:40 AM**

**(ICACC-S9-020-2013) Synthesis of Cubic-shaped ZnO Particles through Controlling Crystal Growth of Metal-Organic Frameworks**

Y. Kimitsuka\*, Keio University, Japan; E. Hosono, National Institute of Advanced Industrial Science and Technology, Japan; S. Ueno, Keio University, Japan; H. Zhou, National Institute of Advanced Industrial Science and Technology, Japan; S. Fujihara, Keio University, Japan

## S10: Virtual Materials (Computational) Design and Ceramic Genome

### Prediction and Modeling of Properties of Ceramics and Composites

Room: Oceanview

Session Chairs: Hans Seifert, Karlsruhe Institute of Technology; Yanwen Zhang, Oak Ridge National Laboratory

**8:00 AM**

**(ICACC-S10-001-2013) First Principles Calculation of Electronic, Optical, and Mechanical Properties of a Large Random Network model of a-SiO<sub>2</sub> Glass (Invited)**

W. Ching\*, N. Li, University of Missouri-Kansas City, USA

**8:30 AM**

**(ICACC-S10-002-2013) Genome Approach for Advanced Ceramics with Extremely Low Thermal Conductivity (Invited)**

J. Wang\*, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, China

**9:00 AM**

**(ICACC-S10-003-2013) A numerical method for the simulation of coupled radiative/conductive heat transfer**

G. L. Vignoles\*, University Bordeaux, France

**9:20 AM**

**(ICACC-S10-004-2013) Structure, Phonon, Bonding, and Hardness of a series of TMB<sub>4</sub>, TMB<sub>6</sub> and TMB<sub>12</sub> (TM = transition metal)**

P. Liu\*, X. Cheng, H. Niu, X. Chen, D. Li, Y. Li, Institute of Metal Research, China

**9:40 AM**

**Break**

**10:00 AM**

**(ICACC-S10-005-2013) Kinetic Monte Carlo Simulation of Cation Diffusion in Low-K Ceramics (Invited)**

B. Good\*, NASA Glenn Research Center, USA

**10:30 AM**

**(ICACC-S10-006-2013) Elastic, Electronic Structure and Optical Properties Change with Increasing Alumina Content in Mullite (Invited)**

S. R. Aryal\*, P. Rulis, W. Ching, University of Missouri Kansas City, USA

**11:00 AM**

**(ICACC-S10-007-2013) First-principles calculation of temperature dependent thermal and mechanical properties of layered ternary carbides, Ti<sub>2</sub>AlC and Cr<sub>2</sub>AlC**

J. Wang\*, J. Wang, Institute of Metal Research, China; Y. Zhou, Aerospace Research Institute of Material & Processing Technology, China

**11:20 AM**

**(ICACC-S10-008-2013) Theoretical investigations of the ferroelectric domain walls in LiNbO<sub>3</sub> by first-principles calculations**

E. Tochigi\*, Lawrence Berkeley National Laboratory, USA; A. Nakamura, Nagoya University, Japan; T. Mizoguchi, The University of Tokyo, Japan

**11:40 AM**

**(ICACC-S10-009-2013) The Effective Elastic Properties of the C/C Composites calculated Using 3D Unit Cell Presentation of the Microstructure**

R. Piat\*, G. Stasiuk, Karlsruhe Inst of Technology, Germany

## 2nd Global Young Investigators Forum

### Ceramic Hybrid Materials and Composites: Ceramic Matrix Composites, Biological and Medical Applications

Room: Coquina Salon F

Session Chairs: Bonex Mwakikunga, Council for Scientific and Industrial Research; Martin Seifert, University of Bayreuth

**8:00 AM**

**(ICACC-GYIF-012-2013) Calculation of the Interlaminar Mode I Crack Growth Energy Release Rate of Carbon/Carbon Composites**  
T. Krause\*, K. Tushtev, University of Bremen, Germany; D. Krause, German Aerospace Center, Germany; G. Grathwohl, University of Bremen, Germany

**8:20 AM**

**(ICACC-GYIF-013-2013) Eosinophil peroxidase-mediated biodegradation of single-walled carbon nanotubes**  
F. Torres Andon\*, Karolinska Institutet, Sweden; A. A. Kapralov, N. Yanamala, W. Feng, University of Pittsburgh, USA; A. Baygan, B. J. Chambers, K. Hultenby, Karolinska Institutet, Sweden; F. Ye, M. S. Toprak, Royal Institute of Technology, Sweden; B. D. Brander, A. Fornara, Institute for Surface Chemistry, Sweden; J. Klein-Seetharaman, G. P. Kotchey, A. Star, University of Pittsburgh, USA; A. A. Shvedova, NIOSH/CDC and West Virginia University, USA; B. Fadeel, Karolinska Institutet, Sweden; V. E. Kagan, University of Pittsburgh, USA

**8:40 AM**

**(ICACC-GYIF-014-2013) Controlled synthesis of SPIONs for biomedical applications**  
G. Salas\*, iMdea Nanoscience, Spain; M. Calero, Universidad Autónoma de Madrid, Spain; C. Casado, F. J. Teran, iMdea Nanoscience, Spain; A. Villanueva, J. Camarero, Universidad Autónoma de Madrid, Spain; R. Miranda, iMdea Nanoscience, Spain; M. Morales, ICMM-CSIC, Spain

**9:00 AM**

**(ICACC-GYIF-015-2013) Controlled Growth of Selectively Doped ZnO Nanocrystals on Calcium Aluminum Silicate Beads Support under Hydrothermal and Solvothermal Conditions for Enhancing Photocatalytic Activity**  
K. Byrappa, K. Namratha\*, University of Mysore, India

**9:20 AM**

Break

### Ceramic Processing and Application: Novel Processing and Synthesis Routes

Room: Coquina Salon F

Session Chairs: Federico Miguel, Saarland University; Gorka Salas Hernandez, Ciudad Universitaria de Cantoblanco

**9:40 AM**

**(ICACC-GYIF-017-2013) Brazing of Silicon Carbide (SiC) to Kovar for the Integration of Metallic Fuel Tubes into a Ceramic Lean Direct Fuel Injector**  
K. Alsup\*, Case Western Reserve University, USA; M. C. Halbig, NASA Glenn Research Center, USA; M. Singh, Ohio Aerospace Institute, USA

**10:00 AM**

**(ICACC-GYIF-019-2013) SiCN/Nb-ceramic composite derived by precursor reaction**  
M. Seifert\*, W. Krenkel, G. Motz, chair of ceramic materials engineering, Germany

**10:20 AM**

**(ICACC-GYIF-020-2013) Ink-Jet Printing: An Efficient Way for Digitally Controlled Device Fabrication**  
M. Vaseem\*, A. Hong, Y. Hahn, Chonbuk National University, Republic of Korea

**10:40 AM**

**(ICACC-GYIF-021-2013) Progress in Ultrasonic Spray Pyrolysis for Ceramic Materials Sciences Developed From Ultrasonic Nebulization Theories Since Michael Faraday**  
B. W. Mwakikunga\*, Council for Scientific and Industrial Research, South Africa

**11:00 AM**

**(ICACC-GYIF-022-2013) Morphology Evolution and Phase Evaluation in MAX Phase – Shape Memory Alloy Interpenetrating Composites**  
L. Hu\*, A. Kothalkar, I. Karaman, M. Radovic, Texas A&M University, USA

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

### Processing, Microstructure and Mechanical Properties Correlation II

Room: Coquina Salon D

Session Chairs: Shaoming Dong, Shanghai Institute of Ceramics, CAS; Sivakumar Ramasamy, The University of Akron

**1:30 PM**

**(ICACC-S1-023-2013) High Fracture Toughness-High Strength Ceramics for Welding Applications**  
V. D. Krstic\*, Queen's University, Canada

**1:50 PM**

**(ICACC-S1-024-2013) Scientific Fundamentals and Industrial Applications of Superhard Nanocomposite Coatings**  
S. Veprek\*, Technical University Munich, Germany

**2:10 PM**

**(ICACC-S1-025-2013) Fabrication of cBN reinforced Y- $\alpha$ -SiAlON composites through the SPS technique**  
J. C. Garrett\*, I. Sigalas, M. Herrmann, University of the Witwatersrand, South Africa

**2:30 PM**

**(ICACC-S1-026-2013) Processing, structure and mechanical behavior of (Si)-B-C ceramics**  
F. Teyssandier\*, C. Pallier, G. Chollon, W. Patrick, J. Leyssale, CNRS-LCTS, France; C. Gervais, LCMCP Paris 6 Collège de France, France; H. Fischer, F. Sirroti, Synchrotron SOLEIL, France

**2:50 PM**

**(ICACC-S1-027-2013) Non-Reactive Processing Methods for Producing Biomorphic Graphite/Copper Composites**  
A. E. Childers\*, K. T. Faber, Northwestern University, USA

**3:10 PM**

Break

**3:30 PM**

**(ICACC-S1-028-2013) Towards a Multiscale Model of Thermally-Induced Microcracking in Porous Ceramics**  
R. S. Fertig\*, University of Wyoming, USA; S. Nickerson, Corning Incorporated, USA

**3:50 PM**

**(ICACC-S1-029-2013) Investigation on reliability of high alumina refractories**  
W. Yuan\*, Q. Zhu, C. Deng, H. Zhu, Wuhan University of Science and Technology, China

**4:10 PM**

**(ICACC-S1-030-2013) Porous oxide ceramic matrix composites produced by the lamination of thermoplastic prepregs**  
P. O. Guglielmi\*, Technische Universität Hamburg-Harburg, Germany; D. Blaese, M. P. Hablitzel, D. P. Goulart, M. C. Fredel, D. Hotza, Universidade Federal de Santa Catarina, Brazil; R. Janssen, Technische Universität Hamburg-Harburg, Germany

**4:30 PM**

**(ICACC-S1-032-2013) Microstructure and Mechanical properties of In-situ processed B4C-HfB2 Composites**  
S. Kannan, T. Murthy\*, J. Sonber, C. Subramanian, R. Hubli, A. Suri, Bhabha Atomic Research Centre, India

**4:50 PM**

**(ICACC-S1-033-2013) Densification of SiC with AlN- Nd2O3 sintering additives**  
L. Wu\*, Y. Jiang, W. Sun, Y. Chen, Z. Huang, Beifang University of Nationalities, China

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

### Thermal Barrier Coatings II

Room: Ponce DeLeon

Session Chair: Kevin Plucknett, Dalhousie University

**1:30 PM**

#### (ICACC-S2-021-2013) Materials R&D Within DOE's Advanced Turbine Program

B. White, P. Burke\*, Dept. of Energy, USA

**2:00 PM**

#### (ICACC-S2-022-2013) Effect of microstructure on the fracture toughness of plasma sprayed thermal barrier coatings

G. Dwivedi, V. Viswanathan\*, Stony Brook University, USA; A. Shyam, E. Lara-Curzio, Oak Ridge National Lab, USA; S. Sampath, Stony Brook University, USA

**2:20 PM**

#### (ICACC-S2-023-2013) Thermal Barrier Coatings Degradation Mechanisms in Land Based Gas Turbines

G. Witz\*, B. Bordenet, H. Bossmann, Alstom Power, Switzerland

**2:40 PM**

#### (ICACC-S2-024-2013) Evaluation of Thermal Degradation of Thermal Barrier Coatings

J. Sun\*, Argonne National Laboratory, USA

**3:00 PM**

Break

## Coating for Tribological Applications

Room: Ponce DeLeon

Session Chair: Shnghua Wu, Guangdong University of Technology

**3:20 PM**

#### (ICACC-S2-025-2013) Innovative ceramic like coatings for tooling, machining, aerospace, energy and automotive industry (Invited)

P. H. Mayrhofer\*, Vienna University of Technology, Austria

**3:50 PM**

#### (ICACC-S2-026-2013) Zirconia Coating on Stainless Steel with Growing Integration Layer [GIL] Oxides (Invited)

M. Yoshimura\*, K. Chen, Y. Lin, C. Hwang, National Cheng Kung University, Taiwan

**4:10 PM**

#### (ICACC-S2-028-2013) Structure and properties of some PVD coatings on ceramic cutting inserts for dry and high speed cutting processes (Invited)

Y. Long, Q. Wang, S. Wu\*, Guangdong University of Technology, China

**4:30 PM**

#### (ICACC-S2-029-2013) Surface Boriding of Titanium Alloys

T. Sarkar, B. Blakney, P. Bishop, K. P. Plucknett\*, Dalhousie University, Canada

**4:50 PM**

#### (ICACC-S2-030-2013) Characterization and Performance of TiB<sub>2</sub> Coatings on SiAlON Ceramic Cutting Tools

S. Turan\*, Anadolu University, Turkey; H. Alagoz, E. Uzun, Bilkent University, Turkey; S. Ulukut, Anadolu University, Turkey; E. Bengu, Bilkent University, Turkey

## S3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

### Electrodes I

Room: Coquina Salon H

Session Chairs: Meilin Liu, Georgia Tech; Fanglin (Frank) Chen, University of South Carolina

**1:30 PM**

#### (ICACC-S3-009-2013) Recent Progress in Modeling and In Situ Characterization of SOFC Electrode Processes (Invited)

M. Liu\*, Georgia Tech, USA; K. Blinn, X. Li, S. Lai, M. Lynch, Georgia Institute of Technology, USA

**2:00 PM**

#### (ICACC-S3-010-2013) Electronic Property of Mn and Fe doped CeO<sub>2</sub> as an Oxide Anode for Solid Oxide Fuel Cell using LaGaO<sub>3</sub> base Electrolyte Film (Invited)

T. Ishihara\*, J. Ju, S. Ida, Kyushu University, Japan

**2:30 PM**

#### (ICACC-S3-011-2013) Heterogeneous Functional Ceramic Anodes for Solid Oxide Fuel Cells (Invited)

G. Xiao, C. Yang, University of South Carolina, USA; Z. Yang, China University of Mining & Technology, China; X. Dong, Q. Liu, L. Zhang, F. Chen\*, University of South Carolina, USA; M. Han, China University of Mining & Technology, China

**3:00 PM**

Break

**3:20 PM**

#### (ICACC-S3-012-2013) Structural and Electrochemical Characterization of Fe-Substituted Perovskite Anodes for Solid Oxide Fuel Cells

D. Fowler\*, S. Cho, J. Haag, S. A. Barnett, K. R. Poeppelmeier, Northwestern University, USA

**3:40 PM**

#### (ICACC-S3-013-2013) Promising anode material for medium temperature SOFCs based on SDC electrolyte

K. Tamm\*, University of Tartu, Estonia; R. Kungas, University of Pennsylvania, USA; E. Lust, University of Tartu, Estonia; R. J. Gorte, University of Pennsylvania, USA

**4:00 PM**

#### (ICACC-S3-014-2013) Nickel Pattern anodes for studying SOFC electrochemistry

H. Patel\*, V. Venkatraman, P. Aravind, Technical University of Delft, Netherlands

**4:20 PM**

#### (ICACC-S3-015-2013) Infiltrated Y-doped SrTiO<sub>3</sub>-based Anodes for Solid Oxide Fuel Cells

A. Torabi\*, T. R. Etsell, University of Alberta, Canada

**4:40 PM**

#### (ICACC-S3-016-2013) Ni Modified WC-based Anode Materials for Direct Methane Solid Oxide Fuel Cells

A. Torabi\*, T. R. Etsell, University of Alberta, Canada

**5:00 PM**

#### (ICACC-S3-017-2013) Tailoring the shrinking upon co-sintering in Metal Supported Solid Oxide Fuel Cells by the addition of doping elements to NiO-anode producing powder

P. Satardekar\*, University of Trento, Italy; D. Montinaro, Viale Trento, Italy; V. Sglavo, University of Trento, Italy



**S4: Armor Ceramics****Boron-Icosahedral Based Ceramics I**

Room: Coquina Salon E

Session Chair: Jerry LaSalvia, U.S. Army Research Laboratory

**1:20 PM****(ICACC-S4-020-2013) Electronic Structures of Boron Crystals (Invited)**

K. Shirai\*, ISIR, Osaka University, Japan

**1:50 PM****(ICACC-S4-021-2013) Failure and Phase Transformation in Boron Carbide from a Shock Physics Perspective (Invited)**

D. Grady\*, Applied Research Associates, USA

**2:30 PM****(ICACC-S4-022-2013) A brief review of deformation induced amorphization of boron carbide (Invited)**

M. Chen\*, Tohoku University, Japan

**3:00 PM****Break****3:20 PM****(ICACC-S4-023-2013) Stoichiometry effects on the mechanical properties of icosahedral boron carbide under load (Invited)**

D. Taylor\*, J. W. McCauley, Army Research Laboratory, USA

**3:50 PM****(ICACC-S4-024-2013) Can We Truly Measure the Hardness of Crystalline Boron Carbide? - New Insights into the Spatial Distribution of Amorphized Zone**

G. Subhash\*, University of Florida, USA

**4:10 PM****(ICACC-S4-025-2013) Indentation Size Effect in Boron Carbide**

E. Shanholtz\*, J. C. LaSalvia, K. D. Behler, U.S. Army Research Lab, USA; V. Domnich, Rutgers University, USA

**4:30 PM****(ICACC-S4-026-2013) Characterization of the Hardness-Load Dependence of Boron Suboxide**

J. C. LaSalvia, U.S. Army Research Laboratory, USA; V. Domnich, Rutgers, The State University of New Jersey, USA; R. Pavlacka\*, E. R. Shanholtz, K. D. Behler, U.S. Army Research Laboratory, USA

**4:50 PM****(ICACC-S4-027-2013) Structural Instability of Boron Carbide Under High-Velocity Impact**

V. Domnich\*, Rutgers University, USA; J. C. LaSalvia, E. R. Shanholtz, U.S. Army Research Laboratory, USA; R. A. Haber, Rutgers University, USA

**S6: Advanced Materials and Technologies for Energy Generation and Rechargeable Energy Storage****Materials for Clean Energy Technologies**

Room: Coquina Salon G

Session Chairs: Kuan-Zong Fung, National Cheng Kung University; Pavol Sajgalik, Slovak Academy of Sciences

**1:30 PM****(ICACC-S6-019-2013) A binder-free process for making all plastic substrate flexible dye-sensitized solar cells having gel electrolyte (Invited)**

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

**2:00 PM****(ICACC-S6-021-2013) Europium and Cerium-Doped MgSiN<sub>2</sub> and LaSi<sub>3</sub>N<sub>5</sub> - Electronic Structure and Luminescent Properties**

Z. Lences\*, L. Benko, M. Hrabalová, A. Czimerová, I. Ibrahim, P. Šajgalik, Slovak Academy of Sciences, Slovakia

**2:20 PM****(ICACC-S6-022-2013) Functionalization of nitride engineering ceramics by polymer derived sintering aids**

P. Sajgalik\*, Z. Lences, T. Plachky, Slovak Academy of Sciences, Slovakia; R. Riedel, H. J. Kleebe, Technische Universität Darmstadt, Germany

**2:40 PM****Break****Energy Storage Technology**

Room: Coquina Salon G

Session Chairs: Kuan-Zong Fung, National Cheng Kung University; Pavol Sajgalik, Slovak Academy of Sciences

**3:20 PM****(ICACC-S6-024-2013) Sodium iron phosphate Na<sub>2</sub>FeP<sub>2</sub>O<sub>7</sub> glass-ceramics for sodium ion battery**

T. Honma\*, T. Togashi, N. Ito, T. Komatsu, Nagaoka University of Technology, Japan

**3:50 PM****(ICACC-S6-025-2013) The Effect of Geometric Factors on Sodium Conduction: A Comparison of  $\beta$ - and  $\beta'$ -Alumina**

E. Kennedy\*, D. Birnie, Rutgers University, USA

**4:10 PM****(ICACC-S6-026-2013) New energy storage with high power and low cost: A combination of computational and experimental study of cathode materials for Na-ion batteries**

J. Xu\*, D. Lee, S. Meng, University of California, San Diego, USA

**S7: 7th International Symposium on Nanostructured Materials and Nanocomposites****Chemical Processing of Nanomaterials I**

Room: Coquina Salon B

Session Chairs: Dunwei Wang, Boston College; An Hardy, Hasselt University - imomec

**1:30 PM****(ICACC-S7-023-2013) Nanostructured metal oxides from aqueous solution deposition (Invited)**

A. Hardy\*, M. Van Bael, Hasselt University - imomec, Belgium

**2:00 PM****(ICACC-S7-061-2013) Rheology of Alumina Nano Powder Suspensions in the Presence of Organic Acids**

S. Cinar\*, M. Akinc, Iowa State University, USA

**2:20 PM****(ICACC-S7-070-2013) Synthesis and Characterisation of Nanostructured Copper Oxide**

D. Dodoo-Arhin\*, University of Ghana, Ghana; M. Leoni, P. Scardi, University of Trento, Italy

**2:40 PM****Break**

**Functional Nanocomposites**

Room: Coquina Salon B

Session Chair: David Kisailus, UC Riverside

**3:30 PM****(ICACC-S7-024-2013) Innovating hematite-based materials for improved solar water splitting (Invited)**

D. Wang\*, Boston College, USA

**4:00 PM****(ICACC-S7-025-2013) Heteroepitaxial Branched TiO<sub>2</sub> Nanorods on Sb:SnO<sub>2</sub> Nanobelt backbones for Photoelectrochemical Hydrogen Production**

S. Park\*, S. Seo, C. Lee, S. Kim, Seoul National University, Republic of Korea; S. Lee, University of California at Berkeley, USA; D. Kim, Ajou University, Republic of Korea; K. Hong, Seoul National University, Republic of Korea

**4:20 PM****(ICACC-S7-026-2013) Plasma-enhanced Chemical Vapour Deposition of Surface Disordered Metal Oxide Nanostructures: Growth and PEC Applications**

A. P. Singh, A. Mettenboerger\*, S. Mathur, University of Cologne, Germany

**4:40 PM****(ICACC-S7-027-2013) Modelling of optical and electrical properties of WO<sub>3</sub> photoanode with use of plasmonic nanostructures in photoelectrochemical systems**

R. Solarska\*, University of Warsaw, Poland; K. Bienkowski, Institute of Technology of Electronic Materials, Poland; J. Augustynski, University of Warsaw, Poland

**5:00 PM****(ICACC-S7-028-2013) Eclipse Transparent Electrode and Applications**

H. Demiryont, K. C. Shannon\*, Eclipse Energy Systems, Inc., USA; M. Bratcher, U. S. Army Research Laboratory, USA

**5:20 PM****(ICACC-S7-029-2013) Atomic Layer Deposition and Plasma-enhanced CVD of Nanometric Metal Oxide thin films for Functional Applications**

T. Singh\*, T. Fischer, S. Mathur, University of Cologne, Germany

**S8: 7th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT)****Integration and Joining**

Room: Coquina Salon A

Session Chairs: Walter Krenkel, University of Bayreuth; Eugene Medvedovski, Consultant

**1:30 PM****(ICACC-S8-021-2013) Lifetime Extension of Metal Pipes by Ceramic Jackets (Invited)**

W. Krenkel\*, N. Langhof, University of Bayreuth, Germany; C. Spatz, Fraunhofer Center for High Temperature Materials and Design, Germany

**2:00 PM****(ICACC-S8-022-2013) Interfacial Characterization of Diffusion Bonded Monolithic and Fiber Bonded Silicon Carbide Ceramics**

H. Tsuda\*, S. Mori, M. C. Halbig, Osaka Prefecture University, Japan; M. Singh, NASA Glenn Research Center, USA

**2:20 PM****(ICACC-S8-023-2013) Development of Graphite/AlN Joints with Al<sub>2</sub>O<sub>3</sub> Phase Penetration**

T. Okuni\*, Y. Miyamoto, Toyo Tanso Co., Ltd., Japan; H. Abe, M. Naito, Joining and Welding Research Institute, Japan

**2:40 PM****(ICACC-S8-024-2013) Joining of alumina by polycarbosilane and siloxane including phenyl groups**

K. Kita\*, N. Kondo, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**3:00 PM****Break****Design-Oriented Manufacturing**

Room: Coquina Salon A

Session Chairs: Walter Krenkel, University of Bayreuth; Eugene Medvedovski, Consultant

**3:20 PM****(ICACC-S8-025-2013) Manufacturing and Application of Ceramic Membranes for Filtration (Invited)**

A. Michaelis\*, I. Voigt, Fraunhofer IKTS, Germany

**3:50 PM****(ICACC-S8-026-2013) Intelligent processes enable new products in the field of non-oxide ceramics**

J. Eichler\*, ESK Ceramics GmbH &amp; Co. KG, Germany

**4:10 PM****(ICACC-S8-027-2013) Influence of Manufacturing on Corrosion Resistance of Advanced Ceramics**

E. Medvedovski\*, Consultant, Canada

**4:30 PM****(ICACC-S8-028-2013) Numerical Analysis of Microstructural Fracture Behavior in Nano Composites under HVEM**

H. Serizawa\*, Osaka University, Japan; T. Shibayama, Hokkaido University, Japan; H. Murakawa, Osaka University, Japan

**4:50 PM****(ICACC-S8-029-2013) Study of the effects of an unexpected ceramic phase at the head of the pipe on joining and post processing of a ceramic-lined composite pipe**

R. Mahmoodian\*, University of Malaya, Malaysia; R. Rahbari Ghahnavyeh, University of Toronto, Canada; M. Hamdi, M. Hassan, M. Sparham, University of Malaya, Malaysia

**S9: Porous Ceramics: Novel Developments and Applications****Processing Methods for Porous Ceramics IV**

Room: Coquina Salon C

Session Chair: Tobias Fey, University of Erlangen-Nuremberg

**1:30 PM****(ICACC-S9-021-2013) Structure Control, Processing and Properties of Porous Ceramics with High Porosity and High Strength (Invited)**

C. Wang\*, Tsinghua University, China

**2:00 PM****(ICACC-S9-022-2013) Controlling the formation of particle-stabilized water-in-oil emulsions**

P. N. Sturzenegger\*, U. T. Gonzenbach, ETH Zurich, Switzerland; S. Koltzenburg, BASF SE, Germany; L. J. Gauckler, ETH Zurich, Switzerland

**2:20 PM****(ICACC-S9-023-2013) Tailoring Network Characteristics of Freeze-Cast Porous Ceramics**

S. M. Miller\*, Northwestern University, USA; X. Xiao, Argonne National Laboratory, USA; K. Faber, Northwestern University, USA

**2:40 PM****(ICACC-S9-024-2013) Boron-Modified Polysilylcarbodiimides-Derived Highly Porous Si-B-C-N Ceramics**

L. Yang\*, L. An, University of Central Florida, USA

3:00 PM

Break

**Mechanical Properties of Porous Ceramics**

Room: Coquina Salon C

Session Chair: Tom Watkins, ORNL

3:20 PM

**(ICACC-S9-025-2013) Uniaxial Tensile Response of Microcracked Porous Ceramics (Invited)**

A. Pandey\*, A. Shyam, T. R. Watkins, E. Lara-Curzio, ORNL, USA; R. J. Stafford, Cummins Inc., USA

3:50 PM

**(ICACC-S9-026-2013) Influence of specimen preparation on the double torsion fracture toughness results for two extruded porous microcracked cordierite compositions**

K. Hoff\*, G. Bruno, T. Montigny, X. Luo, Corning, USA; A. Shyam, T. Watkins, R. Parten, Oak Ridge National Lab, USA

4:10 PM

**(ICACC-S9-027-2013) Non-linear stress-strain relations in porous microcracked ceramics, and their interpretation**

G. Bruno\*, Y. Kilali, M. L. Kachanov, Corning Incorporated, USA

4:30 PM

**(ICACC-S9-028-2013) Impact of Biodiesel on the Mechanical Properties of Diesel Particulate Filter Ceramics (Invited)**

M. J. Lance\*, A. A. Wereszczak, M. K. Ferber, E. E. Fox, T. J. Toops, B. G. Bunting, E. J. Nafziger, A. Williams, Oak Ridge National Laboratory, USA; J. Burton, R. L. McCormick, National Renewable Energy Laboratory, USA

5:00 PM

**(ICACC-S9-029-2013) Mechanical properties of highly porous alumina foams investigated with different testing methods**

B. S. Seeber\*, U. T. Gonzenbach, L. J. Gauckler, ETH Zurich, Switzerland

5:20 PM

**(ICACC-S9-030-2013) Ceramic Foams by Emulsion Templating**

E. García-Tuñón\*, R. Bell, S. Barg, J. Weaver, E. Saiz, Imperial College London, United Kingdom

**S10: Virtual Materials (Computational) Design and Ceramic Genome****Innovative Modeling and Simulation Methods**

Room: Oceanview

Session Chairs: Wai-Yim Ching, University of Missouri-Kansas City; John Lawson, NASA Ames Research Center

1:30 PM

**(ICACC-S10-010-2013) Grain Boundary “Phase” Diagrams — A Useful Component for “Materials Genome”? (Invited)**

N. Zhou, Y. Zhang, J. Luo\*, Clemson University, USA

2:00 PM

**(ICACC-S10-011-2013) Computational ELNES Spectral Imaging Incorporating Signal Contrast**

J. Currie\*, P. Rulis, University of Missouri - Kansas City, USA

2:20 PM

**(ICACC-S10-012-2013) Families of Superhard Crystalline Carbon Allotropes Constructed via Cold-compressed Graphite and Nanotubes**

H. Niu\*, X. Chen, D. Li, Y. Li, Institute of Metal Research, China

2:40 PM

**(ICACC-S10-013-2013) A Multi-method Approach to Modeling Amorphous Boron Carbide**

R. Gramm Horn\*, A. Caruso, M. Paquette, A. Kitahara, P. Rulis, University of Missouri - Kansas City, USA

3:00 PM

Break

3:20 PM

**(ICACC-S10-014-2013) Ab initio MD simulations of the response of ceramics to extreme conditions (Invited)**

H. Xiao\*, University of Tennessee, USA; Y. Zhang, Oak ridge National Lab, USA; W. J. Weber, University of Tennessee, USA

3:50 PM

**(ICACC-S10-015-2013) A Neural Network Approach to Non Self Consistent Total Energy Calculations for Complex Materials (Invited)**

P. Rulis\*, University of Missouri - Kansas City, USA

4:20 PM

**(ICACC-S10-016-2013) Multiscale extraction of morphological features in woven CMCs**

C. C. Chapoullié, J. Da Costa, C. Germain, University Bordeaux, France; M. Cataldi, Herakles, France; G. L. Vignoles\*, University Bordeaux, France

4:40 PM

**(ICACC-S10-017-2013) Electronic Structure and Interatomic Bonding in Cement Crystals**

C. C. Dharmawardhana\*, University Of Missouri - Kansas City, USA; A. Misra, University of Kansas, USA; S. R. Aryal, P. M. Rulis, W. Ching, University Of Missouri - Kansas City, USA

**S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)****Materials Design: MAX Phases and UHTCs**

Room: Coquina Salon F

Session Chair: Sylvain Dubois, Institut PPRIME

1:30 PM

**(ICACC-S12-001-2013) The application of Axial Next-Nearest-Neighbor Ising model to the description of the MAX phases (Invited)**

T. Ouisse\*, D. Chaussende, Grenoble INP, France

2:00 PM

**(ICACC-S12-002-2013) Discovery of the new MAX phase Nb<sub>2</sub>GeC by a systematic theoretical-experimental approach**

P. Eklund\*, M. Dahlqvist, O. Tengstrand, L. Hultman, J. Lu, Linköping University, Sweden; N. Nedfors, U. Jansson, Uppsala University, Sweden; J. Rosén, Linköping University, Sweden

2:20 PM

**(ICACC-S12-003-2013) Thin films of Ga-based MAX phases: Cr<sub>2</sub>GaC and (Cr,Mn)<sub>2</sub>GaC**

A. Petruhins\*, A. Ingason, A. Mockute, P. Persson, J. Rosen, Linköping University, Sweden

2:40 PM

**(ICACC-S12-004-2013) Synthesis of epitaxial (Cr,Mn)<sub>2</sub>AlC – a potential magnetic MAX phase**

A. Mockute\*, M. Dahlqvist, Linköping University, Sweden; J. Emmerlich, RWTH-Aachen University, Germany; L. Hultman, Linköping University, Sweden; J. M. Schneider, RWTH-Aachen University, Germany; P. Persson, J. Rosen, Linköping University, Sweden

3:00 PM

Break

**Materials Design II**

Room: Coquina Salon F

Session Chair: Per Eklund, Linköping University

**3:20 PM****(ICACC-S12-005-2013) Design of High Emissivity Coatings for Hypersonic Applications using Plasma Spray**

W. Tan\*, A. H. Strachan, R. W. Trice, Purdue University, USA

**3:40 PM****(ICACC-S12-006-2013) Synthesis of Novel Hafnium-Containing Ultrahigh-Temperature Ceramic Nanocomposites**

E. Ionescu\*, J. Yuan, B. Mainzer, H. Kleebe, R. Riedel, Technische Universität Darmstadt, Germany

**4:00 PM****(ICACC-S12-007-2013) Graphene NanoPlatelets Reinforced Tantalum Carbide Consolidated by Spark Plasma Sintering**

A. Nieto\*, D. Lahiri, A. Agarwal, Florida International University, USA

**4:20 PM****(ICACC-S12-008-2013) First Steps into Near-Net-Shape Manufacture of UHTC components: Colloidal Processing Revolution**

C. Tallon\*, University of Melbourne, Australia; G. V. Franks, Defence Materials Technology Centre, Australia

**Structure-Property Relationships I**

Room: Coquina Salon F

Session Chair: Thierry Ouisse, Grenoble INP

**4:40 PM****(ICACC-S12-009-2013) Plasmon excitations in MAX phases: evidence of atomic scale superlattice-like behavior**

V. Mauchamp\*, Institut Pprime, France; M. Bugnet, Mc Master University, Canada; P. Chartier, T. Cabioch, M. Jaouen, Institut Pprime, France

**5:00 PM****(ICACC-S12-010-2013) Evidence for anisotropic transport properties of Ti<sub>2</sub>AlC**

W. Yu, V. Mauchamp, V. Gauthier-Brunet, T. Cabioch, Institut PPRIME, France; L. Gence, L. Piroux, Université catholique de Louvain, Belgium; P. Eklund, Linköping University, Sweden; S. Dubois\*, Institut PPRIME, France

**5:20 PM****(ICACC-S12-011-2013) The electronic-structure origin of the anisotropic thermopower of nanolaminated Ti<sub>3</sub>SiC<sub>2</sub> determined by polarized x-ray spectroscopy and Seebeck measurements (Invited)**

M. Magnuson\*, Department of Physics, Chemistry and Biology (IFM), Sweden; M. Mattesini, Astronomía y Astrofísica I, Universidad Complutense de Madrid, Spain; N. Nong, Technical University of Denmark, Denmark; P. Eklund, L. Hultman, Department of Physics, Chemistry and Biology (IFM), Sweden

**Posters****S1 Poster Session**

Room: Ocean Center

**5:30 PM****(ICACC-S1-P002-2013) Rapid fabrication process for C/SiC composites with dispersed SiC slurry infiltration method**

T. Hara\*, Y. Kogo, M. Ishikawa, Tokyo University of Science, Japan; T. Aoki, T. Ogasawara, Japan Aerospace Exploration Agency (JAXA), Japan

**(ICACC-S1-P003-2013) The Study on the sinterability of SiC powders prepared from solarcell wafer sludge**

Y. Kim, D. Chun\*, Inocera inc., Republic of Korea

**(ICACC-S1-P005-2013) A finite element study on the bending behavior of sandwich structured Si-SiC ceramics**

C. D'Angelo\*, A. Ortona, SUPSI, Switzerland

**(ICACC-S1-P006-2013) Microstructure and Properties of Reaction Bonded Metal Modified Ceramics**

S. Salamone\*, M. Aghajanian, M Cubed Technologies Inc., USA; S. Horner, J. Zheng, Program Executive Office-Soldier, US Army, USA

**(ICACC-S1-P008-2013) Weave and Fiber Volume Effects on Durability of Ceramic Matrix Composites**

G. Ojard\*, R. Naik, E. Prevost, Pratt &amp; Whitney, USA; U. Santhosh, Structural Analytics, Inc., USA; D. Jarmon, United Technologies Research Center, USA

**(ICACC-S1-P009-2013) Fiber, Porosity and Weave Effects on Properties of Ceramic Matrix Composites**

G. Ojard\*, Pratt &amp; Whitney, USA; J. Cuneo, Southern Research Institute, USA; I. Smyth, E. Prevost, Pratt &amp; Whitney, USA; Y. Gowayed, Auburn University, USA; U. Santhosh, Structural Analytics, Inc., USA; A. Calomino, NASA – Langley Research Center, USA

**(ICACC-S1-P010-2013) Aqueous Corrosion of Ti(C,N)/Ni<sub>3</sub>Al Cermet**

M. B. Holmes, G. J. Kipouros, Z. N. Farhat, K. P. Plucknett\*, Dalhousie University, Canada

**(ICACC-S1-P011-2013) Structural, dielectric and ferroelectric properties of Sr doped BZTN-BCT ceramics**

J. Rani\*, K. L. Yadav, S. Prakash, Indian Institute of Technology Roorkee, India

**(ICACC-S1-P013-2013) Advanced Ceramics Property Measurements**

J. Salem, NASA GRC, USA; J. D. Helfinstine\*, Corning Inc, USA; G. Quinn, NIST, USA; S. Gonczyk, Gateway Materials Technology, Inc, USA

**(ICACC-S1-P014-2013) Acoustic Emission and Electrical Resistivity Monitoring of SiC/SiC Composite Cyclic Behavior**

C. R. Baker\*, G. N. Morscher, University of Akron, USA

**(ICACC-S1-P015-2013) Acoustic Emission and Electrical Resistivity During Tensile Testing of Different Volume Fraction SiC/SiC Composites**

A. Almansour\*, S. Ramasamy, G. N. Morscher, The University of Akron, USA

**(ICACC-S1-P016-2013) Structural, dielectric and magnetoelectric studies of Ni<sub>0.75</sub>Zn<sub>0.25</sub>Fe<sub>2</sub>O<sub>4</sub>-BiFeO<sub>3</sub> multiferroic composites**

N. Adhlakha\*, K. L. Yadav, Indian Institute of Technology Roorkee, India

**(ICACC-S1-P017-2013) The effect of thermo-mechanical loading and environmental exposure on creep resistance of EBC/CMC systems**

M. P. Appleby\*, G. N. Morscher, University of Akron, USA; D. Zhu, NASA Glenn Research Center, USA

**(ICACC-S1-P019-2013) Local Damage and Heterogeneous Structure in Discontinuous Carbon Fiber Dispersed SiC Matrix Composites under Stress Concentration Source**

R. Inoue\*, H. Kakisawa, Y. Kagawa, University of Tokyo, Japan

**(ICACC-S1-P020-2013) Oxidation behavior and mechanical properties degradation of hot-pressed Al<sub>2</sub>O<sub>3</sub>/ZrB<sub>2</sub>/ZrO<sub>2</sub> ceramic composites**

A. Goodarzi\*, H. Taylor, Harvard University, USA; M. Arslan, Ataturk University, Turkey

**(ICACC-S1-P021-2013) Effect of fiber type on mechanical properties of short carbon fiber reinforced B<sub>4</sub>C composites**

A. Goodarzi\*, H. Taylor, Harvard University, USA; M. Arslan, Ataturk University, Turkey

**(ICACC-S1-P022-2013) Low temperature Diffusion bonding of Alumina-Alumina ceramics by Hydride inter-layer nano powders mixtures**

N. Hosseinabadi\*, R. Sarraf MAmoory, TMU, Islamic Republic of Iran

**(ICACC-S1-P024-2013) Compression failure analysis of graphite foam core based sandwich composite constructions**

H. Hosseini\*, S. Ghaffarian, Amirkabir University of Technology (Tehran Polytechnic), Islamic Republic of Iran; M. Teymouri, A. Moeni, National Iranian Oil Company, Research Institute of Petroleum Industry, Islamic Republic of Iran

**(ICACC-S1-P026-2013) Ultra High Temperature Oxidation of ZrB<sub>2</sub>-SiC-ZrC ceramics up to 1700 °C**

Y. Arai\*, Y. Kogo, M. Ishikawa, Tokyo University of Science, Japan; S. Guo, National Institute for Material Science (NIMS), Japan; K. Goto, Japan Aerospace Exploration Agency (JAXA), Japan; T. Yasuno, Iwaki Meisei University, Japan

**(ICACC-S1-P027-2013) The Effect of Heat Treatment on the Microstructure and Creep Properties of Erbium Oxide containing SiAlON Ceramics**

D. Turan\*, Y. Deniz, S. Kayhan, A. Uludag, Anadolu University, Turkey

## Posters

## S2 Poster Session

Room: Ocean Center

5:30 PM

**(ICACC-S2-P027-2013) Large Transverse Thermoelectric Voltage Effect in Nb-doped SrTiO<sub>3</sub> Single and Multi layer Epitaxial Film**

Y. Qin\*, T. Zhao, J. Yang, State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, China

**(ICACC-S2-P028-2013) The self-healing matrix composites: Numerical approach of dynamic behavior of a self-healing fluid and the composite in a rotational system**

L. Benazzouk\*, E. Arquis, N. Bertrand, C. Descamps, M. Valat, University of Bordeaux 1, France

**(ICACC-S2-P029-2013) First principles simulations of vacancy formation in a  $\Sigma 31$  grain boundary of  $\alpha$ -alumina**

T. Ogawa\*, A. Kuwabara, H. Moriwake, Japan Fine Ceramics Center, Japan; K. Matsunaga, Nagoya University, Japan; S. Kitaoka, Japan Fine Ceramics Center, Japan

**(ICACC-S2-P031-2013) Development of solid lubricant by nano ceramic composite binder**

W. Chung\*, K. Yoo, Korea Automotive Technology Institute, Republic of Korea; G. Lee, SAM SAN SLC co., LTD., Republic of Korea; J. Min, Korea Automotive Technology Institute, Republic of Korea

**(ICACC-S2-P032-2013) Formation of microcrystalline 3C-SiC film from Si and graphite sources by using a high-pressure hydrogen plasma**

H. Ohmi\*, H. Kakiuchi, K. Yasutake, Osaka University, Japan

**(ICACC-S2-P033-2013) Hot Corrosion of ZrO<sub>2</sub>-4mol%Y<sub>2</sub>O<sub>3</sub> Plasma Sprayed Coatings by Volcanic ash**

W. Lee, Gyeongang National University, Republic of Korea; B. Jang\*, T. Hiraoka, H. Araki, H. Murakami, S. Kuroda, National Institute for Materials Science (NIMS), Japan; D. Shin, National Institute for Materials Science (NIMS), Japan, National Institute for Materials Science (NIMS), Japan/Gyeongang National University, Republic of Korea

**(ICACC-S2-P034-2013) Effect of surface morphology on thermal radiation reflectance of oxide ceramics multilayer coatings for high temperature thermal radiation control**

M. Yamazoe\*, H. Kakisawa, Y. Kagawa, University of Tokyo, Japan

**(ICACC-S2-P035-2013) Structural Design and Characterization of Flake-reinforced Oxide Coatings for CMC Surface Protection**

H. Kakisawa\*, T. Matsumoto, Y. Kagawa, University of Tokyo, Japan

**(ICACC-S2-P036-2013) Effect of Extrinsic Factors on Rumpling Behavior of TGO Layer formed by Oxidation of PtAl Bond Coat**

H. Suzuki\*, H. Kakisawa, Y. Kagawa, University of Tokyo, Japan

**(ICACC-S2-P037-2013) Investigation of the three dimensional behavior of MCrAlY bond coat rumpling using high fidelity 3D imaging**

S. Shahbazmohamadi\*, E. Jordan, University of Connecticut, USA

## Posters

## S4 Poster Session

Room: Ocean Center

5:30 PM

**(ICACC-S4-P053-2013) Indentation Behaviour in Spark Plasma Sintered SiC-B4C Ceramics**

D. Hallam\*, P. Smith, J. Yeomans, University of Surrey, United Kingdom; A. Heaton, B. James, DSTL, United Kingdom

**(ICACC-S4-P054-2013) Thermal Stability of Amorphous Boron Carbide Phase Formed Under Indentation**

V. Dornnich\*, Rutgers University, USA; J. C. LaSalvia, E. R. Shanholtz, U.S. Army Research Laboratory, USA; R. A. Haber, Rutgers University, USA

**(ICACC-S4-P055-2013) Characterization of the Amorphous Zone Beneath Static and Dynamic Vickers Indentations in Boron Carbide**

G. Parsard\*, G. Subhash, University of Florida, USA

**(ICACC-S4-P056-2013) Macroscopic Assessment of High Pressure Failure of B4C and B4C/SiC Composites**

S. Salamone, P. Karandikar, A. Marshall, M. Aghajanian\*, M Cubed Technologies, Inc., USA; S. Horner, J. Zheng, Program Executive Office - Soldier, US Army, USA

**(ICACC-S4-P057-2013) Quantum Mechanical Study of Grain Boundaries in Boron Carbide**

T. D. Beaudet\*, Army Research Laboratory, USA; J. R. Smith, Johns Hopkins University, USA; J. S. Dunn, B. M. Rice, J. C. LaSalvia, Army Research Laboratory, USA

**(ICACC-S4-P059-2013) Improvements in the Spark Plasma Sintering of Magnesium Aluminum Spinel**

G. A. Alanko\*, D. Butt, Boise State University, USA

**(ICACC-S4-P060-2013) Consolidation of Aluminum Magnesium Boride (AlMgB14) by Pulsed Electric Current Sintering (PECS) Technique**

G. A. Gilde, K. Cho, N. Kedir\*, Army Research Lab, USA

**(ICACC-S4-P062-2013) Al/Al<sub>2</sub>O<sub>3</sub> metal matrix composites for armor applications**

P. Karandikar\*, M Cubed Technologies, Inc., USA; E. Klier, Army Research Laboratories, USA; M. Watkins, M. Aghajanian, M Cubed Technologies, Inc., USA

**(ICACC-S4-P063-2013) Microstructure and Mechanical Behavior of Pressureless Sintered and Reaction-Bonded Silicon Carbide Ceramics**

A. Trachet\*, G. Subhash, University of Florida, USA; P. Karandikar, M Cubed Technologies, USA

**(ICACC-S4-P064-2013) Geometrical Effect on Damage in Reaction Bonded Ceramic Composites having Experienced High Strain Rate Impact**

A. Marshall\*, M Cubed Technologies, Inc., USA; K. J. Doherty, E. M. Klier, U.S. Army Research Laboratory, USA; P. G. Karandikar, B. P. Givens, A. F. Liszkiewicz, R. Segura, M Cubed Technologies, Inc., USA

**(ICACC-S4-P065-2013) Surface preparation of silicon carbide for improved adhesive bond strength in armour**

A. Harris\*, P. Smith, J. Yeomans, University of Surrey, United Kingdom; S. Burnage, B. Vaughan, Lockheed Martin UK, United Kingdom

**(ICACC-S4-P066-2013) Production of silicon carbide-boron carbide composites for armour applications**

T. Williams\*, J. Yeomans, P. Smith, University of Surrey, United Kingdom; A. Heaton, Dstl, United Kingdom; C. Spacie, R. Bayliss, Morgan AM&amp;T, United Kingdom

**(ICACC-S4-P067-2013) Static and dynamic response of ultra-high strength sintered ceramics**

J. J. Pittari\*, G. Subhash, University of Florida, USA

**(ICACC-S4-P068-2013) Tensile Strength, Fracture Toughness, and Flaw Characterization of Tungsten Carbide**

J. Wright\*, UIC TS, Bowhead Science and Technology, LLC, USA; J. J. Swab, U.S. Army Research Laboratory, USA

**(ICACC-S4-P069-2013) The Effect of a Glass Coating on the Strength of Soda-Lime-Silicate Glass**

S. Thies, S. Kilczewski\*, J. J. Swab, P. Patel, Army Research Laboratory, USA

**(ICACC-S4-P070-2013) Deformation Twinning in Transparent Single Crystals: Indentation Experiments and Mesoscale Modeling**

C. Hilton\*, J. Yu, Oak Ridge Institute for Science and Education, USA; J. Clayton, J. Knap, J. Swab, US Army Research Laboratory, USA

**(ICACC-S4-P071-2013) X-ray Computed Tomography (XCT) of Confined Ceramics**

B. Leavy\*, Army Research Laboratory, USA; C. Peitsch, Chesapeake Defense Services, Inc., USA; W. J. Bruchey, Survive Engineering Company, USA

**(ICACC-S4-P072-2013) Resonant Ultrasound Spectroscopy for the Evaluation of Armor Ceramics**

E. Warner\*, M. Bratcher, U.S. Army Research Laboratory, USA

**(ICACC-S4-P073-2013) Optimizing the Arrangement of Ceramic Tile Periodic Arrays for Armor Applications Using a Genetic Algorithm**

M. C. Golt\*, M. Bratcher, U.S. Army Research Laboratory, USA

**(ICACC-S4-P074-2013) Numerical study of stress and fracture propagation in glass during ring-on-ring testing**

C. G. Fountzoulas\*, J. J. Swab, P. J. Patel, U.S. Army Research Laboratory, USA

**(ICACC-S4-P075-2013) Limits of accelerating numerical analysis study of the failure mechanism of ceramics during low velocity impact used in protective systems**

C. G. Fountzoulas\*, R. E. Brennan, U.S.Army Research Laboratory, USA

**(ICACC-S4-P076-2013) Synthesis of nanocrystalline AlMgB14 powders by solid state synthesis technique**

Z. Xie\*, N. Orlovskaya, University of Central Florida, USA

**(ICACC-S4-P077-2013) Mechanochemical synthesis of hexagonal OsB2**

Z. Xie\*, N. Orlovskaya, University of Central Florida, USA; D. Cullen, Oak Ridge National Laboratory, USA; R. Blair, University of Central Florida, USA

**(ICACC-S4-P173-2013) A Novel Low Temperature Synthesis of Boron Carbide Powders**

L. Gao, C. L. Falticeanu, I. T. Chang\*, University of Birmingham, United Kingdom

**Posters****S6 Poster Session**

Room: Ocean Center

**5:30 PM****(ICACC-S6-P082-2013) Synthesis and Characterization of LIMBO3 Electrode Materials**

H. Lee\*, Y. Lee, Andong National University, Republic of Korea

**(ICACC-S6-P083-2013) Dependence of Temperature and Atmosphere on Conductivity and Crystal Structure and Ni-Co Oxide Solid Solution**

K. Fung\*, Y. Hsu, National Cheng Kung University, Taiwan; C. Wei, H. Bor, Chung-Shan Institute of Science and Technology(CSIST), Taiwan

**(ICACC-S6-P084-2013) Dependence of Chemical Reaction on Degradation of Composite Cathode Consisting of Yttrium Doped Bismuth Oxide ( $Y_{0.25}Bi_{0.75}O_{1.5}$ ) and  $La_{1-x}Sr_xMeO_{3-\delta}$  Perovskite (Me=Mn, Cu)**

K. Fung\*, H. Wang, National Cheng Kung University, Taiwan

**(ICACC-S6-P085-2013) Stability Enhancement of Li Solid Electrolytes against Metallic Li by Cation Substitution**

K. Fung\*, C. Ni, C. Shen, C. Liu, K. Yang, National Cheng Kung University, Taiwan

**(ICACC-S6-P086-2013) Deposition of LiCoO<sub>2</sub> Film on Flexible Substrate for Li Microbattery Applications**

K. Fung\*, C. Ni, C. Liu, National Cheng Kung University, Taiwan

**(ICACC-S6-P087-2013) Effect of Atmosphere on Synthesis and Conductivity of  $Li_4Ti_5O_{12}$  Anode for Li battery application**

K. Fung\*, C. Ni, M. Chen, National Cheng Kung University, Taiwan

**(ICACC-S6-P088-2013) Synthesis n-ZnO/p-CuO Core/Shell Nanorods for Solar Cell Application**

R. Kim\*, J. Kim, Chonbuk National University, Republic of Korea; H. Kim, University of British Columbia, Canada; Y. Hahn, Chonbuk National University, Republic of Korea

**Posters****S8 Poster Session**

Room: Ocean Center

**5:30 PM****(ICACC-S8-P113-2013) Investigation of composites of packed porous alumina with polymer blend**

K. Kita\*, N. Kondo, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**(ICACC-S8-P114-2013) Fracture Toughness of Thin Ceramic Substrates for Power Modules**

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

**(ICACC-S8-P115-2013) Round Robin on Indentation Fracture Resistance of Silicon Carbide for Small Ceramic Products**

H. Miyazaki\*, Y. Yoshizawa, National Institute of Advanced Industrial Science and Technology, Japan; K. Yasuda, Tokyo Institute of Technology, Japan

**(ICACC-S8-P116-2013) Sintering of silicon nitride from beta powder at lower temperatures**

N. Kondo\*, M. Hotta, AIST, Japan

**(ICACC-S8-P117-2013) SiBOC ceramic fibers via pyrolysis of hybrid borosiloxane gel fibers**

G. Soraru\*, V. Nguyen, University of Trento, Italy; V. Proust, C. Quievryn, S. Bernard, P. Miele, IEM/Université Montpellier 2, France

**(ICACC-S8-P118-2013) Wear and Reactivity Studies of Melt Infiltrated Ceramic Matrix Composite**

D. Jarmon, United Technologies Research Center, USA; G. Ojard\*, Pratt &amp; Whitney, USA; D. Brewer, NASA-Langley Research Center, USA

**(ICACC-S8-P119-2013) Effects of Grain Growth Behavior on Texture Development in Bismuth Layer-Structured Ferroelectrics**

M. Saba\*, T. Kimura, Keio University, Japan

**(ICACC-S8-P120-2013) The Rare-Earth Additives Influence on BaTiO<sub>3</sub>-Ceramics Properties**

V. Mitic\*, V. Paunovic, I. Antolovic, D. Rancic, L. Zivkovic, University of Nis, Serbia

**(ICACC-S8-P121-2013) Microstructure and joining strength of silicon nitride long pipes fabricated by local-heating joining technique**

M. Hotta\*, N. Kondo, H. Kita, T. Ohji, National Institute of AIST, Japan

**(ICACC-S8-P122-2013) Electrode Manufacturing of Solid Oxide Fuel Cells**

J. Torres\*, N. Orlovskaya, University of Central Florida, USA; K. Gerdes, S. Lee, National EnergyTechnology Laboratory, USA

**(ICACC-S8-P123-2013) Fabricating Successful Ceramic Components Using Development Carrier Systems**

T. Standing\*, University of Birmingham, United Kingdom; B. Prajapati, R. Richardson-Derry, A. Cendrowicz, Ross Ceramics Ltd., United Kingdom; P. Wilson, Rolls-Royce Plc, United Kingdom; N. Rowson, S. Blackburn, University of Birmingham, United Kingdom

**Posters****S9 Poster Session**

Room: Ocean Center

**5:30 PM****(ICACC-S9-P125-2013) Effect of Enclosed Gas Pressure of Closed Pores on the Mechanical Properties of Cellular Borosilicate Glass**

B. Wang\*, J. Yang, Xi'an Jiaotong University, China; M. Koji, Nagaoka University of Technology, Japan; I. Kozo, Xi'an Jiaotong University, China; N. Koichi, Nagaoka University of Technology, Japan

**(ICACC-S9-P126-2013) Particle-stabilized ceramic foams: properties and applications**

P. N. Sturzenegger\*, B. Seeber, ETH Zurich, Switzerland; U. T. Gonzenbach, de Cavis, Switzerland

**(ICACC-S9-P127-2013) Study of High Temperature Structural Stabilization of Sepiolite and Its Rehydration Behavior**

I. Kara\*, S. Tunali Akar, A. Ozcan, Anadolu University, Turkey

**(ICACC-S9-P128-2013) Processing of Low Cost Ceramic Membranes from Clay Minerals**

J. Eom, S. Yun, Y. Kim\*, The University of Seoul, Republic of Korea; I. Song, Korea Institute of Materials Science, Republic of Korea

**(ICACC-S9-P129-2013) Use of cellular ceramic-supported SrO as a catalyst for the synthesis of biodiesel**

F. B. Bassetti, A. A. Morandim, F. S. Ortega\*, FEI, Brazil

**(ICACC-S9-P130-2013) Zeorite-geopolymer hybrid materials derived from metakaolin**

S. Hashimoto\*, H. Takeda, S. Honda, Y. Iwamoto, Nagoya Institute of Technology, Japan

**(ICACC-S9-P131-2013) Self-Assembly of ZSM-5 Zeolite Crystals**

K. Hari, Y. Lin, L. M. Cole-Burnett, J. R. Brenner\*, Florida Tech, USA

**(ICACC-S9-P132-2013) Silicon Nitride Foams from Emulsions**

P. Colombo\*, E. Guzi de Moraes, University of Padova, Italy

**(ICACC-S9-P133-2013) Effects of Fe<sub>2</sub>O<sub>3</sub> on properties of novel heat insulation materials synthesized by molten salt method**

C. Deng\*, J. Ding, W. Yuan, J. Li, H. Zhu, Wuhan University of Science and Technology, China

## Posters

## FS2 Poster Session

Room: Ocean Center

5:30 PM

**(ICACC-FS2-P160-2013) Effects of matrix precursor, graphitization temperature and graphitization timing on properties of fast-carbonized carbon-carbon composite**

C. Ju\*, Y. Chen, M. Sun, C. Chu, H. Lin, National Cheng-Kung University, Taiwan; K. Lee, I-Shou University, Taiwan; J. Chern Lin, National Cheng-Kung University, Taiwan

**(ICACC-FS2-P161-2013) Effect of heat treatment on structure and properties of Ti-7.5Mo alloy**

J. Chern Lin\*, C. Chung, Y. Chen, Y. Tsai, C. Ju, National Cheng-Kung University, Taiwan

## Posters

## FS3 Poster Session

Room: Ocean Center

5:30 PM

**(ICACC-FS3-P162-2013) The Effects of Polydispersity and Lack of Reproducibility on the Optical Properties and Sensing Performance of Gold Nanoparticles and DNA Aptamer-Coated Gold Nanoparticles**

J. Kindred, J. Chatterjee, A. Marshall, M. Khandelwal, M. Solomon, F. Lopez, D. Roy, E. Henrich, E. Fowler, A. Knight, K. J. Winkelmann, J. R. Brenner\*, Florida Tech, USA

## Wednesday, January 30, 2013

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

## Fiber, Matrices, and Interfaces

Room: Coquina Salon D

Session Chairs: Jacques Lamon, CNRS; Randall Hay, USAF

8:00 AM

**(ICACC-S1-034-2013) Effect of Matrix Microstructure on Composite Properties**

T. Key\*, K. Keller, AFRL/RXCC & UES, USA

8:20 AM

**(ICACC-S1-036-2013) Processing and mechanical properties of melt infiltrated C/SiC composites**

T. Aoki\*, T. Ogasawara, Japan Aerospace Exploration Agency, Japan; T. Hara, M. Ishikawa, Y. Kogo, Tokyo University of Science, Japan; Y. Iwahori, Japan Aerospace Exploration Agency, Japan

8:40 AM

**(ICACC-S1-038-2013) Strength degradation in fatigue for Hi Nicalon filaments at elevated temperature**

J. L. Lamon\*, M. R'Milli, CNRS, France

9:00 AM

**(ICACC-S1-039-2013) Effect of Stress and Steam on Oxidation Rates of Hi-Nicalon-S SiC Fiber**

R. Hay\*, G. Fair, M. Ruggles-Wrenn, B. Steffens, Air Force Research Laboratory, USA; M. Cridge, Wright State University, USA; O. Anhofer, University of Dayton, USA

9:20 AM

**(ICACC-S1-040-2013) Tensile Behavior and Damage Monitoring of SiC fiber reinforced SiC matrix Single Tow MiniComposites**

S. Ramasamy\*, A. Almansour, G. N. Morscher, The University of Akron, USA

9:40 AM

Break

10:00 AM

**(ICACC-S1-041-2013) Microstructural Evolution during Creep Testing of Nextel 610 and Nextel 720 in Air and Steam**

R. Hay\*, G. Fair, M. Ruggles-Wrenn, C. Armani, Air Force Research Laboratory, USA; M. Cridge, Wright State University, USA; O. Anhofer, University of Dayton, USA

10:20 AM

**(ICACC-S1-042-2013) Fabrication and Testing of  $\gamma$ -RE2Si2O7 Matrix Composites**

E. E. Boakye\*, K. Keller, P. Mogilevsky, T. Parthasarathy, UES Inc., USA; M. K. Cinibulk, R. S. Hay, AFRL, USA; M. Ahrens, M. Cridge, Wright State University, USA

10:40 AM

**(ICACC-S1-043-2013) Different Ceramic Fibers Exposed to High Temperature**

H. A. Colorado\*, J. Yang, UCLA, USA; C. Hiel, Composite Support and Solutions Inc., USA

11:00 AM

**(ICACC-S1-044-2013) Study on strength prediction model for unidirectional composites**

H. Zhang\*, W. Wen, H. Cui, J. Xiao, Nanjing University of Aeronautics & Astronautics, China

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

## Multifunctional Coatings

Room: Ponce DeLeon

Session Chairs: Soshu Kirihara, Osaka University; Jeffrey Eldridge, NASA Glenn Research Center

8:00 AM

**(ICACC-S2-031-2013) Plasma-assisted electrolytic coatings and surface treatments for sustainable energy applications (Invited)**

A. Yerokhin\*, University of Sheffield, United Kingdom

8:30 AM

**(ICACC-S2-032-2013) Interface modification of LiMn2O4 cathodes by electronic and ionic conducting coatings (Invited)**

K. Chiu\*, C. Chen, Feng Chia University, Taiwan

9:00 AM

**(ICACC-S2-033-2013) Fabrication of Fine Ceramics Layers by Thermal Nano-particles Coating Techniques (Invited)**

S. Kirihara\*, Y. Itakura, S. Tasaki, Osaka University, Japan

9:20 AM

**(ICACC-S2-034-2013) Surface Modification of La0.6Sr0.4Co0.2Fe0.8O3- $\delta$  Hollow Fiber Membranes for Oxygen Separation**

M. Jacobs\*, B. Michielsen, V. Middelkoop, M. Gijsen, F. Snijkers, VITO, Belgium

9:40 AM

Break

10:00 AM

**(ICACC-S2-035-2013) Dynamic oblique angle deposition of nanostructures for energy applications (Invited)**

G. Wang\*, T. Lu, I. Bhat, Rensselaer Polytechnic Institute, USA

10:20 AM

**(ICACC-S2-036-2013) Nonpolar AlN Thin Films on Diamond for New Electronics Devices (Invited)**

S. Wu\*, Tung-Fang Design University, Taiwan; J. Huang, National Cheng-Kung University, Taiwan; R. Ro, I-Shou University, Taiwan; Z. Lin, Advance Design Technology INC., Taiwan

10:40 AM

**(ICACC-S2-038-2013) Characteristics and Mechanism in Amorphous Oxides for Resistance Random Access Memory Application**

J. P. Chu\*, W. Chang, Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taiwan; S. Wang, Department of Materials and Minerals Resources Engineering, National Taipei University of Technology, Taiwan

**11:00 AM****(ICACC-S2-039-2013) Protective coating based on PDC for high-temperature recovery system**

A. L. Prette\*, University of Bayreuth, Germany; S. Rannabauer, M. Scheffler, Otto-von-Guericke University Magdeburg, Germany; M. Werschy, DBI Gas-und Umwelttechnik GmbH, Germany; M. Wiersig, MIOBA Mitteldescher Industrie-Ofenbau GmbH & Co. KG, Germany; G. Motz, University of Bayreuth, Germany

**11:20 AM****(ICACC-S2-040-2013) Preparation of silica-coated nano-sized Y3Al5O12:Ce3+ phosphor and their luminescence properties**

H. Song\*, D. Kim, C. Lee, H. Roh, Seoul National University, Republic of Korea; D. Kim, Ajou University, Republic of Korea; K. Hong, Seoul National University, Republic of Korea

## S3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

**Electrodes II**

Room: Coquina Salon H

Session Chairs: Mihails Kusnezoff, Fraunhofer IKTS; Sascha Kuehn, eZelleron GmbH

**8:00 AM****(ICACC-S3-018-2013) Sulfur poisoning and reaction kinetics in Ni/YSZ and Ni/GDC anodes (Invited)**

M. Kusnezoff\*, S. Kavurucu Schubert, N. Trofimenko, A. Michaelis, Fraunhofer IKTS, Germany

**8:30 AM****(ICACC-S3-019-2013) Redox behaviour of sulphur at Ni/GDC SOFC anode at mid- and low-range temperatures: An operando S K-edge XANES study**

G. Nurk\*, University of Tartu, Estonia; T. Huthwelker, Paul Scherrer Institut, Switzerland; A. Braun, Empa-Swiss Federal Laboratories for Materials Science and Technology, Switzerland; C. Ludwig, Paul Scherrer Institut, Switzerland; E. Lust, University of Tartu, Estonia; R. Struis, Paul Scherrer Institut, Switzerland

**8:50 AM****(ICACC-S3-020-2013) The systematical study of material natures on La<sub>0.6</sub>Sr<sub>0.4</sub>Co<sub>1-y</sub>FeyO<sub>3-d</sub> cathode (Invited)**

S. Hashimoto\*, M. Oh, Y. Shin, X. Li, Y. Kimura, T. Kawada, Y. Fukuda, I. Nakano, M. Kuhn, H. Kudo, K. Sato, K. Yashiro, K. Amezawa, J. Mizusaki, Tohoku University, Japan

**9:20 AM****(ICACC-S3-021-2013) 3D Microstructural and Electrochemical Evolution of LSM-YSZ Composite Cathodes at Elevated Temperatures**

K. Yakal-Kremiski\*, J. Cronin, S. A. Barnett, Northwestern University, USA

**9:40 AM****Break****10:00 AM****(ICACC-S3-022-2013) Ca<sub>3</sub>Co<sub>4</sub>O<sub>9</sub> and Ba<sub>2</sub>Co<sub>9</sub>O<sub>14</sub> : promising materials as air electrodes for SOFC and SOEC (Invited)**

R. Vannier\*, V. Thoréon, D. Huo, A. Rolle, C. Pirovano, S. Daviero-Minaud, N. Nuns, A. Mamede, Ecole Nationale Supérieure de Chimie de Lille, France

**10:30 AM****(ICACC-S3-023-2013) Assessment of Ba<sub>1-x</sub>Co<sub>0.9-y</sub>FeyNb<sub>0.1</sub>O<sub>3-δ</sub> for Prospective High Temperature Electrochemical Devices (Invited)**

M. Han\*, Z. Yang, S. Song, P. Zhang, F. Chen, China University of Mining and Technology, Beijing, China

**11:00 AM****(ICACC-S3-024-2013) Life Testing of LSM-YSZ Composite Electrodes During Current-Switched Operation**

G. A. Hughes\*, K. Yakal-Kremiski, S. A. Barnett, Northwestern University, USA

**11:20 AM****(ICACC-S3-025-2013) Electrochemical Analysis for Microstructural Optimization of SSC Infiltrated Solid Oxide Fuel Cell Cathodes**

A. V. Call\*, Z. Gao, S. A. Barnett, Northwestern University, USA

**11:40 AM****(ICACC-S3-026-2013) In-Operando XRD of LSCF Cathodes on Anode-Supported SOFCs Operating at Various Temperatures**

J. S. Hardy\*, J. W. Templeton, J. W. Stevenson, Pacific Northwest National Laboratory, USA

**S4: Armor Ceramics****Boron-Icosahedral Based Ceramics II**

Room: Coquina Salon E

Session Chair: Jane Adams, U.S. Army Research Laboratory

**8:00 AM****(ICACC-S4-028-2013) Boride Carbide Ballistic Performance above the Hugoniot Elastic Limit (Invited)**

M. J. Normandia\*, Ceradyne, USA

**8:30 AM****(ICACC-S4-029-2013) Armour research at FOI on boron carbide**

P. Lundberg\*, Defence & Security, Systems and Technology Division, Sweden

**8:50 AM****(ICACC-S4-030-2013) Edge-on Impact investigation of fracture propagation in Boron Carbide**

E. Strassburger\*, Fraunhofer EMI, Germany

**9:10 AM****(ICACC-S4-031-2013) Intact and predamaged boron carbide strength under moderate confinement pressures**

I. S. Chocron, C. E. Anderson\*, K. A. Dannemann, A. E. Nicholls, N. L. King, Southwest Research Inst, USA

**9:30 AM****Break****Quasi-Static and Dynamic Behavior I**

Room: Coquina Salon E

Session Chair: Sikhanda Satapathy, US Army Research Laboratory

**9:50 AM****(ICACC-S4-032-2013) Pressure and Shear Induced Phase Transformations in Ceramics (Invited)**

V. I. Levitas\*, Iowa State University, USA

**10:20 AM****(ICACC-S4-033-2013) Raman Characterization of Ballistically-Impacted Polycrystalline 3C and 6H Silicon Carbides**

J. C. LaSalvia\*, U.S. Army Research Laboratory, USA; V. Domnich, Rutgers, The State University of New Jersey, USA; K. D. Behler, E. R. Shanholzt, U.S. Army Research Laboratory, USA

**10:40 AM****(ICACC-S4-034-2013) Thermal Effects in Extreme Dynamic Environments**

M. J. Davis\*, SCHOTT North America, Inc., USA

**11:00 AM****(ICACC-S4-035-2013) Shock experiments to study source of inelasticity in ceramics**

S. Satapathy\*, D. Dandekar, C. Williams, US Army Research Laboratory, USA

**11:20 AM****(ICACC-S4-036-2013) Effect of Prestressing on the Ballistic Performance of Alumina Ceramics: Experiments and Modeling**

A. H. Gassman\*, V. Paris, L. Levin, Z. Asaf, A. Ya'akovovich, E. Ran, F. Aizik, Plasan Sasa Ltd., Israel



## S6: Advanced Materials and Technologies for Energy Generation and Rechargeable Energy Storage

### Advanced Materials for Energy Harvesting and Storage

Room: Coquina Salon G

Session Chairs: Eldon Case, Michigan State Univ.; Truls Norby, University of Oslo

#### 8:00 AM

**(ICACC-S6-028-2013) On synthesis, phase purity, and oxygen stoichiometry of sodium and calcium cobaltate thermoelectrics (Invited)**

T. Norby\*, H. Fjeld, M. Schrader, T. Finstad, University of Oslo, Norway; O. Løvik, SINTEF, Norway; C. Simone, University of Milan, Italy

#### 8:30 AM

**(ICACC-S6-029-2013) Spark plasma sintering of oxide thermoelectric materials (Invited)**

R. Donelson\*, A. Seeber, CSIRO, Australia; C. Chen, M. Kabir, UNSW, Australia

#### 9:00 AM

**(ICACC-S6-030-2013) The Seebeck Coefficient of Mesoscopic Nanocrystalline SrTiO<sub>3</sub>**

G. Gregori\*, S. Heinze, P. Lupetin, H. Habermeyer, J. Maier, Max Planck Institute for Solid State Research, Germany

#### 9:20 AM

**(ICACC-S6-031-2013) Thermal shock and thermal fatigue of thermoelectrics – strategies and trade-offs**

E. D. Case\*, Michigan State Univ., USA

#### 9:40 AM

Break

#### 10:00 AM

**(ICACC-S6-032-2013) Novel Flexible Thin Layer Electrochemical Components for Thermal Batteries**

T. Leviatan\*, S. Cohen, I. Eilal, Rafael Ltd., Israel; G. E. Shter, A. Choen, V. Beilin, G. S. Grader, Technion-Israel Institute of Technology, Israel

#### 10:20 AM

**(ICACC-S6-033-2013) Enhancement of the Thermoelectric Performance of p-type Ca<sub>3</sub>Co<sub>4</sub>O<sub>9</sub>+δ with Spark Plasma Sintering Technology**

R. Tian\*, T. Zhang, S. Li, University of New South Wales, Australia; R. Donelson, CSIRO, Australia

#### 10:40 AM

**(ICACC-S6-034-2013) Processing dependent thermoelectric properties of Na<sub>0.77</sub>CoO<sub>2</sub>-Ca<sub>3</sub>Co<sub>4</sub>O<sub>9</sub> composites**

C. Chen\*, T. Zhang, R. Tian, D. Chu, The University of New South Wales, Australia; R. Donelson, CSIRO, Australia; S. Li, The University of New South Wales, Australia

## S7: 7th International Symposium on Nanostructured Materials and Nanocomposites

### Chemical Processing of Nanomaterials II

Room: Coquina Salon B

Session Chairs: Werner Mader, University of Bonn; Jordi Arbiol, ICREA and Institut de Ciencia de Materials de Barcelona, ICMAB-CSIC

#### 8:00 AM

**(ICACC-S7-030-2013) Metals and composites from solution (Invited)**

G. Westin\*, K. Lashagari, A. Pohl, Uppsala University, Sweden; K. Jansson, Stockholm University, Sweden

#### 8:30 AM

**(ICACC-S7-031-2013) Precursor dependent morphology of hydrothermal SrTiO<sub>3</sub> nanostructures. Evidence for different crystallization pathways (Invited)**

V. Buscaglia\*, M. Buscaglia, National Research Council, Italy; V. Kalyani, University of Genoa, Italy; A. Ianculescu, B. Vasile, Polytechnics University of Bucharest, Romania; P. Nanni, University of Genoa, Italy

#### 9:00 AM

**(ICACC-S7-032-2013) Nanoscale Oxides for Photocatalytic Applications (Invited)**

G. R. Patzke\*, University of Zurich, Switzerland

## Nanotubes, Nanorods, Nanowires and Other One-dimensional Structures

Room: Coquina Salon B

Session Chairs: Greta Patzke, University of Zurich; Vincenzo Buscaglia, IENI-CNR

#### 9:50 AM

**(ICACC-S7-034-2013) VLS Growth Mechanism of ZnO Nanowires (Invited)**

W. Mader\*, H. Simon, T. Krekeler, G. Schaan, University of Bonn, Germany

#### 10:20 AM

**(ICACC-S7-035-2013) Precursor decomposition pathways during chemical vapor deposition of metal oxide nano-structures (Invited)**

T. Fischer\*, I. Giebelhaus, S. Mathur, University of Cologne, Germany

#### 10:40 AM

**(ICACC-S7-036-2013) Fabrication of heterostructured ZnO nanowires and their applications in quantum dot sensitized solar cells (Invited)**

K. Yong\*, POSTECH, Republic of Korea

#### 11:10 AM

**(ICACC-S7-037-2013) Visualization of light atoms (O and N) in semiconductor NWs: direct way to determine the polarity in 1D nanostructures (Invited)**

J. Arbiol\*, M. de la Mata, R. Zamani, ICREA and Institut de Ciencia de Materials de Barcelona, ICMAB-CSIC, Spain; J. R. Morante, Catalonia Institute for Energy Research, IREC, Spain

#### 11:40 AM

**(ICACC-S7-038-2013) Nafen: Novel Nanomaterial With Industrial Production Capabilities**

M. Kutuzov\*, ANF Development, Estonia

## S8: 7th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT)

### SPS and SHS

Room: Coquina Salon A

Session Chairs: Eugene Olevsky, San Diego State University; Hisayuki Suematsu, Nagaoka University of Technology

#### 8:00 AM

**(ICACC-S8-030-2013) Spark-Plasma Sintering (SPS) and High Voltage Electrical Discharge Consolidation (HVEDC): Fundamental Aspects and Scalability (Invited)**

E. Olevsky\*, San Diego State University, USA; E. Grigoryev, Moscow Engineering Physics University, Russian Federation

#### 8:30 AM

**(ICACC-S8-031-2013) Combustion Synthesis (SHS) of Complex Ceramic Materials (Invited)**

J. Lis\*, AGH University of Science and Technology, Poland

**9:00 AM**

**(ICACC-S8-032-2013) Spark Plasma Sintering of UO<sub>2</sub>: An investigation of densification and microstructure evolution**  
L. Ge\*, G. Subhash, R. H. Baney, J. S. Tulenko, University of Florida, USA

**9:20 AM**

**(ICACC-S8-033-2013) Spark Plasma Sintering Induced Grain Refining in Al<sub>2</sub>O<sub>3</sub> Ceramics**  
J. Liu\*, L. An, University of Central Florida, USA; F. Yang, University of Kentucky, USA

**9:40 AM**

**Break**

**Novel Sintering Technologies**

Room: Coquina Salon A

Session Chairs: Eugene Olevsky, San Diego State University; Hisayuki Suematsu, Nagaoka University of Technology

**10:00 AM**

**(ICACC-S8-034-2013) High voltage flash sintering in cubic zirconia**  
J. A. Downs\*, V. M. Sglavo, University of Trento, Italy

**10:20 AM**

**(ICACC-S8-035-2013) Flash Sintering of Electroceramic Devices (Invited)**  
B. Vaidhyanathan\*, Loughborough University, United Kingdom

**10:40 AM**

**(ICACC-S8-036-2013) Development of Pulsed Wire Discharge Apparatus to Produce Metal Nanosized Powders**  
H. Suematsu\*, S. Ishihara, T. Suzuki, T. Nakayama, K. Niihara, Nagaoka University of Technology, Japan

**11:00 AM**

**(ICACC-S8-037-2013) Fabrication of anisotropic nanostructured materials using the atmospheric non-equilibrium plasma**  
T. Nakayama\*, S. Endo, A. Tokuchi, W. Jiang, H. Suematsu, T. Suzuki, K. Niihara, Nagaoka Univ of Tech, Japan

**11:20 AM**

**(ICACC-S8-038-2013) Development of Transparent Ceramics by Laser Fusing**  
F. Hmood\*, C. Oelgardt, G. Reinhard, J. G. Heinrich, Clausthal University of Technology, Germany

**11:40 AM**

**(ICACC-S8-039-2013) Additive Manufacturing: Lasers Interacting with Ceramic Powders**  
T. Mühler\*, J. Heinrich, TU Clausthal, Germany; J. Günster, BAM - Federal Institute for Materials Research and Testing, Germany

**S9: Porous Ceramics: Novel Developments and Applications****Applications of Porous Ceramics I**

Room: Coquina Salon C

Session Chair: James Zimmermann, Corning

**8:00 AM**

**(ICACC-S9-031-2013) Pt coated porous SiC foams for catalytical hydrogen combustion (Invited)**  
U. F. Vogt\*, B. Fumey, M. Bielmann, A. Zuettel, Empa, Switzerland

**8:30 AM**

**(ICACC-S9-032-2013) Heterogeneous heteroporous ceramics**  
A. Ortona\*, C. D'angelo, SUPSI, Switzerland; V. Liedtke, Aerospace & Advanced Composites, Austria; C. Wilhelmi, EADS Innovation Works, Germany; D. Gaia, Erbicol, Switzerland; C. Badini, Politecnico di Torino, Italy; W. Fischer, Astrium, Germany

**8:50 AM**

**(ICACC-S9-033-2013) Dead-end silicon carbide micro-filters for liquid filtration**  
R. Neufert, M. Moeller, A. Bakshi\*, Saint-Gobain, USA

**9:10 AM**

**(ICACC-S9-034-2013) Perovskite Catalysts Enhanced Combustion on Porous Media**  
M. D. Robayo\*, N. Orlovskaya, R. Chen, University of Central Florida, USA

**9:30 AM**

**Break**

**Applications of Porous Ceramics II**

Room: Coquina Salon C

Session Chair: James Zimmermann, Corning

**9:50 AM**

**(ICACC-S9-035-2013) Development of new silica foam for thermal insulation**  
E. Prud'homme\*, P. Michaud, GEMH-ENSCI, France; E. Joussein, GRESE, France; S. Rossignol, GEMH-ENSCI, France

**10:10 AM**

**(ICACC-S9-036-2013) Si-SiC heat exchangers with highly structured surface elements for recuperative gas burners**  
A. Ortona\*, SUPSI, Switzerland; S. Gianella, Erbicol, Switzerland; D. Trimis, V. Uhlig, R. Eder, TU Bergakademie Freiberg, Germany; E. Boulet, C. Chazelas, Institut Français du textile et de l'habillement, France; T. Grämer, NOXMAT, Germany; G. D'Amico, P. Fino, Politecnico di Torino, Italy; E. Cresci, J. G. Wünnig, WS Wärmeprozess-technik, Germany; H. Altena, Aichelin, Austria; F. Beneke, M. Debier, European Committee of Industrial Furnace and Heating Equipment Associations CECOF, Belgium

**10:30 AM**

**(ICACC-S9-037-2013) The Influence of Calcination and Milling on Microstructure and Colloidal Properties of 8 YSZ Used in Ceramic Fuel Cells**  
A. R. Hanifi, A. Torabi\*, T. H. Etsell, University of Alberta, Canada; P. Sarkar, Alberta Innovates - Technology Futures, Canada

**10:50 AM**

**(ICACC-S9-038-2013) Development of alkali-resistant controlled pore glass based on (65-x) SiO<sub>2</sub>-25B<sub>2</sub>O<sub>3</sub>-10 Na<sub>2</sub>O-xZrO<sub>2</sub>/ZrSiO<sub>4</sub> system**  
M. Hasanuzzaman\*, A. G. Olabi, Dublin City University, Ireland

**11:10 AM**

**(ICACC-S9-039-2013) Preparation of Spherical Shaped Mullite Powders and Microstructural Evaluation During Sintering**  
C. Ozgur\*, R. Gören, Dumlupinar University, Turkey

**S10: Virtual Materials (Computational) Design and Ceramic Genome****Modeling of Defects and Diffusion in Ceramics**

Room: Oceanview

Session Chairs: Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences; Brian Good, NASA Glenn Research Center

**8:00 AM**

**(ICACC-S10-019-2013) Irradiation Effects in Fluorite-Structured Oxides (Invited)**  
Y. Zhang\*, Oak Ridge National Laboratory, USA; H. Xiao, University of Tennessee, USA; P. Edmondson, Oak Ridge National Laboratory, USA; T. Varga, Pacific Northwest National Laboratory, USA; F. Namavar, University of Nebraska Medical Center, USA; W. J. Weber, Oak Ridge National Laboratory, USA

**8:30 AM**

**(ICACC-S10-020-2013) Conductive path formation in insulating oxide using dislocations and interfaces (Invited)**  
A. Nakamura\*, K. Matsunaga, Nagoya University, Japan; T. Mizoguchi, University of Tokyo, Japan; E. Tochigi, Lawrence Berkeley National Laboratory, USA; N. Shibata, Y. Ikuhara, University of Tokyo, Japan

**9:00 AM**

**(ICACC-S10-022-2013) Particle Swarm Optimization for Modeling Defect Regions in Crystalline Systems**  
N. A. Dari\*, P. M. Rulis, University of Missouri-Kansas City, USA

9:20 AM

**(ICACC-S10-023-2013) Materials Thermodynamics and Phase Modeling in Lithium Ion Battery Systems (Invited)**

H. J. Seifert\*, M. Lepple, D. M. Cupid, P. Franke, Karlsruhe Institute of Technology, Germany

9:50 AM

Break

10:10 AM

**(ICACC-S10-024-2013) Lithium ion diffusion in fast ion conducting lithium lanthanum titanate ceramics (Invited)**

J. Du\*, University of North Texas, USA

10:40 AM

**(ICACC-S10-025-2013) Theoretical Prediction of Charge Induced Point Defect Behavior of Cubic Zirconia**

B. Liu\*, Y. Zhang, Oak Ridge National Laboratory, USA; W. J. Weber, The University of Tennessee, USA

11:00 AM

**(ICACC-S10-026-2013) Surface structure and oxygen adsorption on Cr<sub>2</sub>AlC (0001): Density functional characterization**

N. Li\*, UMKC, USA

11:20 AM

**(ICACC-S10-027-2013) Surface and mechanical properties of zinc titanate crystals from first principles calculations**

W. Sun\*, J. Du, University of North Texas, USA

**S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)****Structure-Property Relationships II**

Room: Coquina Salon F

Session Chair: Ji Zou, Katholieke Universiteit Leuven

8:00 AM

**(ICACC-S12-012-2013) Computational modeling of grain boundaries in ZrB<sub>2</sub>: implications for lattice thermal conductivity**

J. W. Lawson\*, NASA Ames Research Center, USA; M. S. Daw, Clemson University, USA; T. H. Squire, C. W. Bauschlicher, NASA Ames Research Center, USA

8:20 AM

**(ICACC-S12-014-2013) Correlation between magnetic state and bulk modulus of Cr<sub>2</sub>AlC**

M. Dahlqvist\*, B. Alling, J. Rosén, Linköping University, Sweden

8:40 AM

**(ICACC-S12-015-2013) Study of deformation mechanisms of the Ti<sub>2</sub>AlN MAX phase at room temperature**

A. Guillon\*, A. Joulain, L. Thilly, C. Tomas, Pprime Institute, France; S. Van Petegem, H. Van Swygenhoven, Paul Scherrer Institute, Switzerland

9:00 AM

**(ICACC-S12-016-2013) Influence of Precursors Stoichiometry on SHS Synthesis of Ti<sub>2</sub>AlC Powders**

L. Chlubny\*, J. Lis, AGH-University of Science and Technology, Poland

9:20 AM

**(ICACC-S12-013-2013) Processing and Thermal Properties of ZrB<sub>2</sub> with Varying Boron Isotope Ratios**

J. M. Lonergan\*, W. Fahrenholtz, G. Hilmas, Missouri University of Science &amp; Technology, USA

9:40 AM

Break

**Structure-Property Relationships III**

Room: Coquina Salon F

Session Chair: John Lawson, NASA Ames Research Center

9:50 AM

**(ICACC-S12-018-2013) Effects of Processing and Oxide Contaminants on the Densification of ZrB<sub>2</sub> Ultra-High Temperature Ceramics Using Spark Plasma Sintering**

D. Pham\*, L. S. Walker, E. L. Corral, University of Arizona, USA

10:10 AM

**(ICACC-S12-020-2013) The effect of chemical composition on the densification, thermal and oxidation behaviour of different stoichiometries of zirconium and hafnium oxycarbides**

D. D. Jayaseelan\*, S. Wang, X. Yanda, Imperial College, United Kingdom; P. Brown, DSTL Porton Down, United Kingdom; W. Lee, Imperial College, United Kingdom

10:30 AM

**(ICACC-S12-019-2013) The ZrB<sub>2</sub>+C Solid Solution Limit and Its Effect on Thermal and Electrical Properties**

G. J. Harrington\*, G. E. Hilmas, W. G. Fahrenholtz, Missouri University of Science and Technology, USA

10:50 AM

**(ICACC-S12-021-2013) Fabrication on thermal stability of HfB<sub>2</sub> matrix composite at severe oxidation condition**

A. Goodarzi\*, H. Taylor, Harvard University, USA

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

Room: Coquina Salon D

Session Chair: Dileep Singh, Argonne National Laboratory

1:30 PM

**(ICACC-S1-045-2013) Evaluation of Interfacial Fracture Toughness from Single-Fiber Push-Out Tests applied to Ceramic Matrix Composite Samples**

W. M. Mueller\*, J. Moosburger-Will, M. G. Sause, S. Horn, University of Augsburg, Germany

1:50 PM

**(ICACC-S1-046-2013) Characterization of SiC/SiCN ceramic matrix composites with monazite fiber coating**

E. Klatt\*, K. Kelm, M. Friess, D. Koch, H. Voggenreiter, German Aerospace Center (DLR), Germany

2:10 PM

**(ICACC-S1-047-2013) Effects of Non-Uniform Strains on Tensile Fracture of Ceramic Composites**

V. Rajan\*, F. W. Zok, University of California Santa Barbara, USA

2:30 PM

**(ICACC-S1-048-2013) Damage Accumulation Behavior of Silicon Carbide Matrix Composites by Inter-Laminar Tensile Mode**

T. Nozawa\*, K. Ozawa, T. Nakata, H. Tanigawa, Japan Atomic Energy Agency, Japan

2:50 PM

**(ICACC-S1-049-2013) Thermally-driven delamination in ceramic matrix composites**

J. H. Shaw\*, F. W. Zok, UC Santa Barbara, USA

3:10 PM

Break

3:30 PM

**(ICACC-S1-050-2013) Characterization of Defects in Textile Composites using 3-D Digital Image Correlation**

M. N. Rossol\*, F. W. Zok, UC Santa Barbara, USA

**3:50 PM****(ICACC-S1-051-2013) Delamination in multilayered thin film oxide superconductor composite tapes**

V. Selvamanickam\*, I. Kesgin, G. Majkic, E. Galtsyan, University of Houston, USA; C. Lei, SuperPower, USA

**4:10 PM****(ICACC-S1-052-2013) Cooling performance tests of a CMC nozzle with annular sector cascade rig**

N. Kozo\*, O. Yoji, N. Chiyuki, IHI Corporation, Japan

## S3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

### Interfacial Reactions/Degradation

Room: Coquina Salon H

Session Chairs: Scott Barnett, Northwestern Univ; Eric Wachsman, University of Maryland

**1:30 PM****(ICACC-S3-027-2013) Three-Dimensional Characterization of Solid Oxide Fuel Cell Microstructure: Correlation With Electrochemical Performance and Degradation (Invited)**

S. Cronin, K. Yakal-Kremksi, D. Kennouche, Northwestern Univ, USA

**2:00 PM****(ICACC-S3-028-2013) Long-term stability of the oxygen surface exchange kinetics of SOFC cathode materials (Invited)**

W. Sitte\*, E. Bucher, A. Egger, Montanuniversitaet Leoben, Austria

**2:30 PM****(ICACC-S3-029-2013) Visualization of Oxide Ionic Diffusion at Cathode/Electrolyte Interfaces by Isotope Oxygen Labeling/Secondary Ion Mass Spectrometry Imaging Technique (Invited)**

T. Horita\*, D. Cho, T. Shimonosono, M. Nishi, H. Kishimoto, K. Yamaji, M. E. Brito, H. Yokokawa, AIST, Japan

**3:00 PM**

Break

**3:20 PM****(ICACC-S3-030-2013) Mn-doped YSZ interlayer for improving the durability of solid oxide electrolysis cells**

N. Li\*, M. Keane, M. K. Mahapatra, P. Singh, Uconn, USA

**3:40 PM****(ICACC-S3-031-2013) Strontium diffusion in magnetron sputtered gadolinia-doped ceria thin film barrier coatings for solid oxide fuel cells**

S. Sonderby\*, Danish Technological Institute, Denmark; P. Lunca Popa, J. Lu, Linkoping University, Sweden; B. H. Christensen, K. P. Almtoft, L. P. Nielsen, Danish Technological Institute, Denmark; P. Eklund, Linkoping University, Sweden

### Sealing Glasses

Room: Coquina Salon H

Session Chair: Scott Barnett, Northwestern Univ

**4:00 PM****(ICACC-S3-032-2013) Compliant sealing glass for SOFC applications: microstructure optimization**

Y. Chou\*, J. Choi, J. W. Stevenson, E. Mast, Pacific Northwest National Lab, USA

**4:20 PM****(ICACC-S3-033-2013) Viscous Sealing Glass Development for Solid Oxide Fuel Cells**

C. Kim\*, MO-SCI Corporation, USA; R. K. Brow, Missouri University of Science and Technology, USA; J. Szabo, MO-SCI Corporation, USA; J. Hsu, C. Townsend, Missouri University of Science and Technology, USA

**4:40 PM****(ICACC-S3-034-2013) Interface reactions between barium-free sealing glasses with high-chromium alloys**

J. Suffner\*, U. Dahlmann, V. Bernd, Schott AG, Germany

## S4: Armor Ceramics

### Quasi-Static and Dynamic Behavior II

Room: Coquina Salon E

Session Chair: Sikhanda Satapathy, US Army Research Laboratory

**1:20 PM****(ICACC-S4-039-2013) Anisotropy, Damage and the Dynamic Piezoelectric Effect**

L. E. Lamberson\*, Drexel University, USA; E. Korimilli, K. T. Ramesh, Johns Hopkins University, USA

**1:40 PM****(ICACC-S4-040-2013) Use of Brazilian disk test to determine the mechanical strength of laminated-ceramic composites**

C. J. Espinoza Santos\*, J. Lambros, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**2:00 PM****(ICACC-S4-041-2013) Influence of porosity on the mechanical behavior of alumina/porous alumina laminates**

P. Sellappan\*, W. M. Kriven, J. Lambros, University of Illinois at Urbana-Champaign, USA

**2:20 PM****(ICACC-S4-042-2013) Validity of Split Hopkinson Pressure Bar Testing for Ceramics**

E. Lopez-Lopez\*, R. Gerlach, S. Falco, C. E. Dancer, University of Oxford, United Kingdom; C. Roberson, Sir Frank Whittle Business Centre, United Kingdom; N. Petrinic, R. I. Todd, University of Oxford, United Kingdom

**2:40 PM****(ICACC-S4-043-2013) Mechanical Response Anisotropy in Hot-Pressed Silicon Carbide**

A. Wereszczak\*, D. Vuono, Oak Ridge National Laboratory, USA; K. Bortle, P. Ritt, ORISE, USA; J. Swab, J. Campbell, US Army Research Laboratory, USA

**3:00 PM**

Break

**3:20 PM****(ICACC-S4-044-2013) Microstructure and Mechanical Properties of SiC-TiB<sub>2</sub> Ceramic Composites**

D. King\*, W. Fahrenholtz, G. Hilmas, Missouri University of Science and Technology, USA

**3:40 PM****(ICACC-S4-045-2013) Properties and Performance of Cubic-Boron Nitride**

J. J. Swab\*, E. Warner, J. Campbell, T. Jessen, Army Research Laboratory, USA

### Synthesis and Processing I

Room: Coquina Salon E

Session Chair: Robert Pavlacka, U.S. Army Research Laboratory

**4:20 PM****(ICACC-S4-046-2013) Processing of optical ceramics using current activated pressure assisted densification (Invited)**

J. E. Garay\*, University of California, Riverside, USA

**4:50 PM****(ICACC-S4-047-2013) Development of Transparent Polycrystalline Beta-Silicon Carbide Ceramic using FAST**

G. R. Villalobos\*, S. S. Bayya, J. S. Sanghera, US Naval Research Lab, USA; M. P. Hunt, University Research Foundation, USA; C. M. Carney, K. A. Keller, M. K. Cinibulk, US Air Force Research Center, USA; B. M. Sadowski, I. D. Aggarwal, Sotera Defense Solutions, Inc., USA

## S5: Next Generation Bioceramics and Biocomposites

### Porous Bioceramics - Joint Session with Symposium 9

Room: Coquina Salon C

Session Chairs: Eldon Case, Michigan State Univ.; Federico Rosei, INRS; Enrico Bernardo, University of Padova; Akiyoshi Osaka, Okayama University

**1:30 PM**

**(ICACC-S5-001-2013) Nanoscale structure and modification of Biomaterials (Invited)**

F. Rosei\*, INRS, Canada

**1:50 PM**

**(ICACC-S5-002-2013) Grain size dependence of fracture toughness for hydroxyapatite (Invited)**

E. D. Case\*, Michigan State Univ., USA

**2:10 PM**

**(ICACC-S5-003-2013) Novel biocompatible glass-ceramic foams from low temperature foaming and reactive ceramization of silicone-based mixtures (Invited)**

E. Bernardo\*, J. Carlotti, L. Fiocco, M. Pace, P. Colombo, University of Padova, Italy

**2:30 PM**

**(ICACC-S5-004-2013) Redox Active Nanoparticles Mediated Angiogenesis to Facilitate Wound Healing (Invited)**

S. Seal\*, S. Das, S. Chigurupati, S. Oommen, W. T. Self, M. P. Mattson, University of Central Florida, USA

**2:50 PM**

**Break**

**3:20 PM**

**(ICACC-S5-005-2013) Increasing Mechanical Strength of Carbonate Apatite Block by Ca Salt Introduction**

J. Harland\*, K. Tsuru, Kyushu University, Japan; M. Maruta, Fukuoka Dental College, Japan; G. Kawachi, K. Ishikawa, Kyushu University, Japan

**3:40 PM**

**(ICACC-S5-006-2013) Bioactive Ceramic Foams for Bone Tissue Engineering**

B. A. Mound\*, J. P. Ball, J. B. Allen, F. Barrie, M. V. Manuel, J. C. Nino, University of Florida, USA

**4:00 PM**

**(ICACC-S5-008-2013) Hydrothermal conversion of calcite foam to carbonate apatite**

T. X. Nguyen\*, Kyushu university, Japan; M. Michito, Fukuoka Dental College, Japan; T. Kanji, Kyushu university, Japan; M. Shigeki, Fukuoka Dental College, Japan; I. Kunio, Kyushu university, Japan

**4:20 PM**

**(ICACC-S5-007-2013) Collagen coatings on 45S5 Bioglass® scaffolds**

J. Hum\*, A. R. Boccaccini, University of Erlangen-Nuremberg, Institute of Biomaterials, Germany

## S7: 7th International Symposium on Nanostructured Materials and Nanocomposites

### Bio-active Nanomaterials and Nanostructured Materials for Bio-medical Applications

Room: Coquina Salon B

Session Chairs: Mufit Akinc, Iowa State Univ; Yoon-Bong Hahn, Chonbuk National University; Donglu Shi, University of Cincinnati

**1:30 PM**

**(ICACC-S7-039-2013) Impact of the Physicochemical Properties of Engineered Nanomaterials on their Cellular Uptake and Potential Toxicity (Invited)**

P. Dutta\*, The Ohio State University, USA

**2:00 PM**

**(ICACC-S7-041-2013) Biocide activity of copper nanoparticles supported on biogenic silica**

B. Cabal\*, M. Miranda, M. Suárez, Nanomaterials and Nanotechnology Research Center (CINN), Spain; F. Rojo, F. Malpartida, National Center for Biotechnology (CNB-CSIC), Spain; R. Torrecillas, Nanomaterials and Nanotechnology Research Center (CINN), Spain; J. S. Moya, Materials Science Institute of Madrid (ICMM-CSIC), Spain

**2:20 PM**

**(ICACC-S7-042-2013) Investigation of surface properties of nano-structured TiO2 for dental implants design**

S. Issa\*, P. Cenedese, IICMPE-MCMC, CNRS UMR 7182, 2-8, rue Henri Dunant, 94320 THIAIS, France; C. Azevedo, U.F.R. Odontologie, France; P. Dubot, IICMPE-MCMC, CNRS UMR 7182, 2-8, rue Henri Dunant, 94320 THIAIS, France

**2:40 PM**

**(ICACC-S7-043-2013) High Performance Glucose and Cholesterol Biosensors Based on Zinc Oxide Nanostructures (Invited)**

Y. Hahn\*, Chonbuk National University, Republic of Korea

**3:10 PM**

**(ICACC-S7-044-2013) Nano-hydroxyapatite composites for medical applications**

K. Balazsi, I. Lukacs, G. Gergely, Hungarian Academy of Sciences, Hungary; C. Chae, Hallym University, Republic of Korea; P. Gouma, State University of New York at Stony Brook, USA; S. Kim, Gangneung-Wonju National University, Republic of Korea; C. Balazsi\*, Hungarian Academy of Sciences, Hungary

**3:30 PM**

**(ICACC-S7-045-2013) Bottom up Approach to Design of Nanostructured Materials: Biomimicking and Bioinspiration (Invited)**

M. Akinc\*, Y. Hu, Y. Yusufoglu, X. Liu, K. Schmidt-Rohr, S. Mallapragada, Iowa State Univ, USA

**4:00 PM**

**(ICACC-S7-046-2013) Design of Multifunctional "Plug and Play" Nano-Carriers for Biomedical Applications (Invited)**

H. Dong, Y. Li, Tongji University, China; D. Shi\*, University of Cincinnati, USA

**4:30 PM**

**(ICACC-S7-047-2013) Self-Assembly of Nanomaterials: Ammonium Hydrogen Phosphate Crystals, Zeolite Crystals, and Lysozyme Fibers Characteristic of Alzheimer's Disease**

K. Hari, Y. Lin, L. M. Cole-Burnett, B. J. Burnett, S. Xu, J. R. Brenner\*, Florida Tech, USA

**4:50 PM**

**(ICACC-S7-048-2013) Controlling the Growth of Biofilms on Ceramics using Nanoparticle Coatings**

C. Larimer, M. Islam, A. Ojha, I. Nettleship\*, University of Pittsburgh, USA

**5:10 PM**

**(ICACC-S7-040-2013) A Green Chemical Approach for Highly Water-Soluble and Biocompatible Superparamagnetic Magnetite Nanoparticles for Enhanced MRI**

S. Mathur, L. Xiao\*, University of Cologne, Germany

## S8: 7th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT)

### Joint S8 & S9: Rapid Prototyping of Porous Ceramics

Room: Coquina Salon A

Session Chair: Paolo Colombo, University of Padova

**1:30 PM**

#### (ICACC-S9-040-2013) Commercialization of Robocasting for the Production of Porous Structures (Invited)

J. Cesarano\*, Robocasting Enterprises LLC, USA

**2:00 PM**

#### (ICACC-S9-041-2013) 3D printing of Porous Polymer-Derived-Ceramics

A. Zocca\*, C. M. Gomes, J. Guenster, BAM Federal Institute for Materials Research and Testing, Germany; P. Colombo, E. Bernardo, University of Padova, Italy

**2:20 PM**

#### (ICACC-S9-042-2013) Cellular Si-SiC ceramics by indirect rapid prototyping

C. D'Angelo\*, A. Ortona, SUPSI, Switzerland; D. Gaia, S. Gianella, Erbicol, Switzerland

**2:40 PM**

#### (ICACC-S9-043-2013) Highly-porous LAS glass-ceramics by 3D Printing

C. M. Gomes\*, A. Zocca, J. Guenster, BAM Federal Institute for Materials Research and Testing, Germany; P. Colombo, University of Padova, Italy

**3:00 PM**

Break

## Prototyping, Patterning and Shaping

Room: Coquina Salon A

Session Chairs: Nahum Travitzky, University of Erlangen-Nuremberg; Soshu Kirihaara, Osaka University

**3:20 PM**

#### (ICACC-S8-042-2013) Creation of Surface Geometric Structures by Thermal Micro-lines Patterning Techniques

S. Kirihaara\*, Y. Itakura, S. Tasaki, Osaka University, Japan

**3:40 PM**

#### (ICACC-S8-043-2013) Mechanical Properties and Cracking Behavior of 3D Printed Refractory Ceramics

J. F. Bredt\*, Massachusetts Institute of Technology, USA

**4:00 PM**

#### (ICACC-S8-044-2013) Optimized Shaping Process for Transparent Spinel Ceramic

A. Kaiser\*, LAEIS GmbH, Luxembourg; T. Hutzler, Fraunhofer Institute for Ceramic Technologies and Systems, Germany; A. Krell, Fraunhofer Institute for Ceramic Technologies and Systems, Germany; R. Kremer, ALPHA CERAMICS GmbH, Germany

**4:20 PM**

#### (ICACC-S8-045-2013) Fabricating complex-shaped ceramic components by injection molding ceramic suspension gels at room temperature

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

**4:40 PM**

#### (ICACC-S8-041-2013) Utilization of Nano-Constituents in Thermoplastics for High Strength, Low Loss Tangent Fused Deposition Three-Dimensionally Printed Structures

Z. J. Larimore\*, United States Army Research Labs, USA

## S10: Virtual Materials (Computational) Design and Ceramic Genome

### Virtual Materials Design and Modeling

Room: Oceanview

Session Chairs: Jian Luo, UCSD; Paul Rulis, University of Missouri - Kansas City

**1:30 PM**

#### (ICACC-S10-028-2013) Multiscale Modeling of Ablative Composites for Atmospheric Entry Applications (Invited)

J. W. Lawson\*, C. W. Bauschlicher, T. H. Squire, J. D. Monk, NASA Ames Research Center, USA

**2:00 PM**

#### (ICACC-S10-029-2013) Thermomechanical simulation of C/C composites from X-ray CMT images (Invited)

G. L. Vignoles\*, O. Caty, University Bordeaux, France; G. Couégnat, CNRS, France; M. Charron, T. Agulhon, University Bordeaux, France

**2:30 PM**

#### (ICACC-S10-030-2013) Inelastic Design of MMCs with Lamellar Microstructure

R. Piat\*, Y. Sinchuk, Karlsruhe Inst of Technology, Germany

**3:00 PM**

Break

**3:20 PM**

#### (ICACC-S10-031-2013) Explicit modelling of crack initiation and propagation in the microstructure of a ceramic material generated with Voronoi tessellation

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

**3:40 PM**

#### (ICACC-S10-032-2013) Multi-scale modeling of textile reinforced ceramic composites

M. Sejnoha\*, J. Vorel, CTU in Prague, Faculty of Civil Engineering, Czech Republic

**4:00 PM**

#### (ICACC-S10-033-2013) The self-healing matrix composites: Numerical approach of dynamic behavior of a self-healing fluid and the composite in a rotational system

L. Benazzouk\*, E. Arquis, N. Bertrand, University of Bordeaux 1, France; C. Descamps, Snecma, France; M. Valat, University of Bordeaux 1, France

**4:20 PM**

#### (ICACC-S10-034-2013) Numerical estimation of the infiltrability of woven CMC preforms

G. L. Vignoles\*, W. Ros, C. Germain, University Bordeaux, France

**4:40 PM**

#### (ICACC-S10-035-2013) First Principles Calculations of Boron Suboxide

J. S. Dunn\*, T. Beudet, Army Research Laboratory, USA; J. R. Smith, University of Michigan, USA

## S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

### Structural Stability under Extreme Environments I

Room: Coquina Salon F

Session Chair: Matthieu Bugnet, McMaster University

**1:30 PM**

**(ICACC-S12-022-2013) Arc-jet testing of LaB<sub>6</sub>-containing ZrB<sub>2</sub>-SiC materials under high enthalpy supersonic air flows (Invited)**

F. Monteverde\*, National Research Council of Italy, Italy

**2:00 PM**

**(ICACC-S12-023-2013) Modelling Damage and Failure in Structural Ceramics at Ultra-High Temperatures**

M. Pettina\*, F. Biglari, D. D. Jayaseelan, P. Vandepierre, Imperial College London, United Kingdom; P. M. Brown, DSTL Porton Down, United Kingdom; A. Heaton, K. Nikbin, Imperial College London, United Kingdom

**2:20 PM**

**(ICACC-S12-024-2013) Oxidation behavior of Graphene NanoPlatelets Reinforced Tantalum Carbide composites in High Temperature Plasma Flow**

A. Nieto\*, D. Lahiri, C. Zhang, A. Agarwal, Florida International University, USA

**2:40 PM**

**(ICACC-S12-025-2013) Modelling of oxidation effects in the Ultra High Temperature Ceramic structures**

M. Pettina\*, Imperial College London, United Kingdom; F. Abdi, Alpha STAR Corporation, USA; K. Nikbin, Imperial College London, United Kingdom; Y. Xue, Alpha STAR Corporation, USA

**3:00 PM**

Break

### Structural Stability under Extreme Environments II

Room: Coquina Salon F

Session Chair: Shaoming Dong, Shanghai Institute of Ceramics, CAS

**3:20 PM**

**(ICACC-S12-026-2013) Behavior of MAX phase thin films under ion irradiation (Invited)**

M. Bugnet\*, CNRS-Université de Poitiers-ENSMA, France, CNRS-Université de Poitiers-ENSMA, France/McMaster University, Canada; V. Mauchamp, T. Cabioch, CNRS-Université de Poitiers-ENSMA, France; E. Oliviero, CNRS-IN2P3-Université Paris-Sud, France; F. Mortreuil, CNRS-Université de Poitiers-ENSMA, France; P. Eklund, Linköping University, IFM, Sweden; M. Jaouen, CNRS-Université de Poitiers-ENSMA, France

**3:50 PM**

**(ICACC-S12-027-2013) Ultra High Temperature Mechanical Testing of ZrB<sub>2</sub> Based Ceramics**

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

**4:10 PM**

**(ICACC-S12-029-2013) Thermal Stability of Cr<sub>2</sub>AlC and Ta<sub>4</sub>AlC<sub>3</sub> in Argon Atmosphere at Elevated Temperature**

J. Low\*, Curtin University, Australia

**4:30 PM**

**(ICACC-S12-028-2013) Hafnia polycrystals with a polymer-derived amorphous HfSiCNO interfacial phase for Ultrahigh Temperature Structural Applications**

I. Lisenker\*, R. Raj, University of Colorado, USA

## S13: Advanced Ceramics and Composites for Sustainable Nuclear Energy and Fusion Energy

### Radiation Defects in Ceramics / Codes and Standards

Room: Ponce DeLeon

Session Chairs: Sosuke Kondo, Kyoto University; James Hemrick, Oak Ridge National Laboratory

**1:30 PM**

**(ICACC-S13-001-2013) Defect Stability and Mobility in Nano-engineered Silicon Carbide (Invited)**

T. Oda\*, University of Tennessee, USA; Y. Zhang, Oak Ridge National Laboratory, USA; W. J. Weber, University of Tennessee, USA

**2:00 PM**

**(ICACC-S13-002-2013) Off-stoichiometric Sintering of Oxide Fuel and Fuel Surrogates**

J. B. Henderson\*, Netzsch Instruments North America LLC, USA

**2:20 PM**

**(ICACC-S13-003-2013) Effects of Ionization on Irradiation Damage in Silicate Ceramics**

W. J. Weber\*, M. Backman, University of Tennessee, USA; Y. Zhang, Oak Ridge National Laboratory, USA; M. Toulemonde, University of Caen, France

**2:40 PM**

**(ICACC-S13-004-2013) A Hybrid Model on Low Energy Ion Beam Induced Quantum Dot Structuring in GaAs**

E. Hernandez\*, University of Michigan, USA; V. Tikare, Sandia National Laboratory, USA; L. Wang, University of Michigan, USA

**3:00 PM**

Break

**3:20 PM**

**(ICACC-S13-005-2013) Test Methods for Hoop Tensile Strength of Ceramic Composite Tubes for Light Water Nuclear Reactor Applications (Invited)**

M. G. Jenkins\*, Bothell Engineering and Science Technologies, USA; J. A. Salem, NASA Glenn Research Center, USA

**3:40 PM**

**(ICACC-S13-006-2013) Test Methods for Flexural Strength of Ceramic Composite Tubes for Small Modular Reactor Applications**

M. G. Jenkins\*, Bothell Engineering and Science Technologies, USA; T. L. Nguyen, Levitas Consultants, USA

**4:00 PM**

**(ICACC-S13-008-2013) New ASTM Committee C28 Material Specifications for Carbon-Carbon and SiC-SiC Composite for Nuclear Applications**

S. T. Gonczy\*, Gateway Materials Technology, USA; Y. Katoh, Oak Ridge National Laboratory, USA

**4:20 PM**

**(ICACC-S13-009-2013) Round-Robin Interlaboratory Study for the Precision of Uniaxial Tensile Testing of Ceramic Composite Tubes**

S. T. Gonczy\*, Gateway Materials Technology, USA; Y. Katoh, Oak Ridge National Laboratory, USA; M. Jenkins, California State University, USA

**4:40 PM**

**(ICACC-S13-007-2013) Advanced Cladding Inspection Using Innovative Optical Morphological Analysis**

J. E. Garnier, M. V. Glazoff, S. Rashkeev, I. J. Van Rooyen, G. W. Griffith, S. Bragg-Sitton\*, Idaho National Laboratory, USA

## Engineering Ceramics Summit of the Americas

### Ceramics for Human Health

Room: Coquina Salon G

Session Chairs: Mrityunjay Singh, Ohio Aerospace Institute; Jose Varela, University of Sao Carlos

#### 1:30 PM

##### (ICACC-ECSA-001-2013) Innovative Ceramic Technologies to Transform the World (Invited)

L. Hench\*, University of Florida, USA

#### 2:00 PM

##### (ICACC-ECSA-002-2013) Novel Calcium Phosphate Silicate Cements for Dentistry: A Case Study of Successful Commercialization of Bioceramics in Canada (Invited)

T. Troczynski\*, UBC, Canada

#### 2:30 PM

##### (ICACC-ECSA-003-2013) New materials for energy and biomedical applications (Invited)

B. Bregadioli, D. Leite, UNESP, Brazil; A. H. González, P. H. D. Alpino, UNIBAN, Brazil; C. F. Graeff\*, UNESP, Brazil

#### 3:00 PM

#### Break

#### 3:20 PM

##### (ICACC-ECSA-004-2013) Medical Initiatives from the Nuclear Community: Applications of Unique 'Multi-Use Technologies' (Invited)

G. W. Wicks\*, Savannah River National Laboratory, USA

#### 3:50 PM

##### (ICACC-ECSA-005-2013) Tailoring Ceramic Material Systems for Bioreactors used in Regenerative Medicine (Invited)

I. Nettleship\*, University of Pittsburgh, USA

#### 4:20 PM

##### (ICACC-ECSA-006-2013) Chemiosensor Response of Inorganic Oxides (Invited)

A. A. Felix, P. H. Suman, D. P. Volanti, UNESP- Araraquara, Brazil; H. L. Tuller, Massachusetts Institute of Technology, USA; M. O. Orlandi, J. A. Varela\*, UNESP- Araraquara, Brazil

## Posters

### S3 Poster Session

Room: Ocean Center

#### 5:00 PM

##### (ICACC-S3-P038-2013) Mechanical Properties of Ni / (Sc<sub>2</sub>O<sub>3</sub>)<sub>0.1</sub>(CeO<sub>2</sub>)<sub>0.01</sub>(ZrO<sub>2</sub>)<sub>0.89</sub> Porous Anodes

Y. Chen\*, N. Orlovskaya, University of Central Florida, USA; T. Graule, J. Kuebler, Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for High Performance Ceramics, Switzerland

##### (ICACC-S3-P039-2013) A Study of the Anelastic Relaxation of Defect Complexes in Oxide Ceramics by Resonant Ultrasound Spectroscopy

P. Gao\*, M. Westwick, Texas A&M University, USA; T. Ali, British University in Egypt, Egypt; M. Radovic, Texas A&M University, USA

##### (ICACC-S3-P040-2013) Preparation of Ce<sub>0.9</sub>Sm<sub>0.1-x</sub>Tb<sub>x</sub>O<sub>2-δ</sub> Films by Using Ultrasonic Spray Pyrolysis

M. Vestli\*, M. Maide, E. Anderson, G. Nurk, E. Lust, Institute of Chemistry, University of Tartu, Estonia

##### (ICACC-S3-P041-2013) Oxygen permeability and phase stability of SrCoO<sub>3-δ</sub>-based mixed conducting perovskite membrane

T. Nagai\*, W. Ito, Nippon Steel Corp., Japan

##### (ICACC-S3-P042-2013) Influence of the Method of Sintering on Phase Assemblage and Electrical Conductivity of Zirconia-Scandia-Ceria Solid Electrolyte

R. L. Grosso, E. N. Muccillo\*, Energy and Nuclear Research Institute, Brazil

##### (ICACC-S3-P043-2013) Effects of Humidity in Cathode Air on LSM/YSZ Cathodes

J. W. Templeton\*, J. S. Hardy, S. W. Jeffrey, Pacific Northwest National Laboratory, USA

##### (ICACC-S3-P044-2013) Ionic conductivity in mullite and mullite type compounds

C. H. Rüscher\*, F. Kiesel, Leibniz University Hannover, Germany

##### (ICACC-S3-P045-2013) Electrical Properties of Composite YSZ/Al<sub>2</sub>O<sub>3</sub>

H. Araujo\*, D. F. Souza, PPGCEM- UFSCar, Brazil

##### (ICACC-S3-P046-2013) Influence of sintering temperature on the electrical properties of GDC/YSZ composites

R. F. Marcomini, D. F. Souza\*, Programa de Pós Graduação em Ciência e Engenharia de Materiais, Brazil

##### (ICACC-S3-P047-2013) ZnO as sintering aid of Yttrium-doped BaCeO<sub>3</sub>

F. J. Macambira\*, D. F. Souza, PPGCEM-UFSCar, Brazil; C. M. Hosken, UFF, Brazil

##### (ICACC-S3-P048-2013) The effect of Co and Zn addition on densification and electrical properties of ceria-based nanopowders

L. A. Villas-Bôas\*, D. F. Souza, PPGCEM-UFSCar, Brazil; F. Marques, F. Figueiredo, University of Aveiro, Portugal

##### (ICACC-S3-P049-2013) Numerical Simulation of Electrolyte-Supported Planar Button Solid Oxide Fuel Cell (SOFC)

A. Aman\*, R. Gentile, Y. Chen, Y. Xu, University of Central Florida, USA; X. Huang, University of South Carolina, USA; N. Orlovskaya, University of Central Florida, USA

##### (ICACC-S3-P050-2013) Structural Stability and Conductivity of La<sub>0.8</sub>Ca<sub>0.2</sub>Fe<sub>1-x</sub>Co<sub>x</sub>O<sub>3</sub> (x=0–0.4) Perovskite in Reducing Atmosphere

K. Fung\*, H. Liu, C. Liu, National Cheng Kung University, Taiwan

##### (ICACC-S3-P051-2013) Structural and conductivity studies of doped lanthanum gallate

K. Sood\*, K. Singh, O. P. Pandey, Thapar University, India

##### (ICACC-S3-P052-2013) Mixed Protonic-Anionic Conducting Ceramics For Dual Membrane Fuel Cells

M. Viviani, S. Presto, V. Buscaglia\*, G. Canu, National Research Council, Italy; A. Barbucci, P. Carpanese, University of Genoa, Italy; Z. Stoynov, D. Vladikova, Bulgarian Academy of Sciences, Bulgaria; A. Thorel, Mines-ParisTech, France; Z. Ilhan, DLR, Germany

##### (ICACC-S3-P174-2013) Effect of Pore-Formers of Anode-Support Microstructure on the Performance of Micro-Tubular Solid Oxide Fuel Cells

H. Kim\*, POSTECH, Republic of Korea; J. Lee, T. Lim, S. Lee, S. Park, R. Song, D. Shin, Korea Institute of Energy Research, Republic of Korea; N. Sammes, POSTECH, Republic of Korea

##### (ICACC-S3-P175-2013) Solid Oxide Fuel Cell Combined with Supercritical Water Oxidation on Using Biomass Gas

H. Kim\*, A. Parfitt, Y. Chung, N. Sammes, POSTECH, Republic of Korea

##### (ICACC-S3-P176-2013) SOFC Anode Coking Mechanisms and Potential Solutions

Y. Chung\*, H. Kim, N. Sammes, POSTECH, Republic of Korea

##### (ICACC-S3-P177-2013) Thermodynamic, electrical, and electrochemical properties of Sm<sub>0.5</sub>Sr<sub>0.5</sub>Co<sub>1-x</sub>Nb<sub>x</sub>O<sub>3-δ</sub> (x = 0, 0.05, and 0.1) as cathode materials in IT-SOFCs

S. Yoo, UNIST, Republic of Korea; J. Shin, Dong-Eui University, Republic of Korea; G. Kim\*, UNIST, Republic of Korea

## Posters

### S5 Poster Session

Room: Ocean Center

#### 5:00 PM

##### (ICACC-S5-P078-2013) Friction and Wear Behavior of Ceramic (Used for Head of Total Hip Replacement)

F. Mamoun\*, L. Mohammed, laboratory of metallurgy and materials engineering, Algeria



**(ICACC-S5-P079-2013) Effect of sintering additives on Mechanical Properties and Bioactivity of Hydroxyapatite/ $\beta$ -Tricalcium Phosphate Composites**

S. Kobayashi\*, T. Murakoshi, Tokyo Metropolitan University, Japan

**(ICACC-S5-P080-2013) Synthesis of doped calcium phosphate nanorods**

T. S. Eufrásio, A. G. Prette, V. M. Sglavo\*, University of Trento, Italy

**(ICACC-S5-P081-2013) Electrospinning vs. Three-Dimensional (3D) Rapid Prototype Bioprinting**

M. Hansen, J. R. Brenner\*, Florida Tech, USA

**Posters****S7 Poster Session**

Room: Ocean Center

**5:00 PM****(ICACC-S7-P091-2013) Sol-Gel Approach to the Calcium Phosphate Nanocomposites**

A. Beganskiene\*, Z. Stankeviciute, M. Malakauskaite, I. Bogdanovicene, Vilnius University, Lithuania; K. Tõnsuaadu, Tallinn University of Technology, Estonia; A. Kareiva, Vilnius University, Lithuania

**(ICACC-S7-P092-2013) Surface modification of SnO<sub>2</sub> nanoparticles by Ti<sup>4+</sup>**

J. Miagava\*, D. Gouvea, Universidade de Sao Paulo, Brazil; A. Navrotsky, R. Castro, University of California - Davis, USA; A. Rubbens, P. Roussel, Université de Lille, France

**(ICACC-S7-P093-2013) Preparation and Photoelectric Properties of ZnO/a-Si<sub>1-x</sub>C<sub>x</sub>H Heterojunctions**

T. Zhao\*, Y. Qin, J. Yang, State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, China

**(ICACC-S7-P094-2013) Effect of Incorporation of Clay and Zinc Oxide Nanoparticles on Oxygen Barrier Properties of Polypropylene Films**

M. Oner, P. Atayev\*, Yildiz Technical University, Turkey

**(ICACC-S7-P095-2013) Polymeric gels and colloidal route of the sol-gel process -alternatives to produce Fe-ZrSiO<sub>4</sub>**

G. Herrera\*, N. Montoya, J. Alarcón, Universidad de Valencia, Spain

**(ICACC-S7-P096-2013) Eddy Current and Microwave Characterization of Fe-based Alloy Synthesized by Mechanical Alloying**

Z. Hamlati\*, S. Bergheul, University of Saad Dahleb, Algeria; M. Azzaz, U.S.T.H.B, Algeria

**(ICACC-S7-P097-2013) Inkjet Printed Fractal-Connected Electrodes with Silver Nanoparticle Ink**

M. Vaseem\*, A. Hong, Y. Hahn, Chonbuk National University, Republic of Korea

**(ICACC-S7-P098-2013) The Effect of Silicon Carbide Nano-Dispersants on the Hardness and Indentation Size Effect of Alumina/Silicon Carbide Nanocomposites**

J. Wade\*, H. Wu, Loughborough University, United Kingdom

**(ICACC-S7-P099-2013) Stoichiometry-Controlled Growth of Ba<sub>x</sub>Sr<sub>1-x</sub>TiO<sub>3</sub> Nanoparticles and Their Thin Films for Heterojunction Devices Application**

D. Liu, A. Hong\*, H. Bae, S. Das, Y. Hahn, Chonbuk National University, Republic of Korea

**(ICACC-S7-P102-2013) Effect of raw materials and fabrication parameters on the structure and morphology of Nanocrystalline magnesium aluminate spinel powders fabricated by gel combustion method**

A. Sedghi\*, Imam Khomeini International University, Islamic Republic of Iran; S. Poostian, Azad University, Saveh Branch, Islamic Republic of Iran; P. Sedghi, Azad University, Science and research campus, Islamic Republic of Iran; M. Salmani, Azad University, Saveh Branch, Islamic Republic of Iran

**(ICACC-S7-P103-2013) Internal Reduction of Transition Metal Doped Oxides and Perovskites**

A. Morrissey\*, J. Tong, I. E. Reimanis, Colorado School of Mines, USA; J. R. O'Brien, Quantum Design, Inc., USA

**(ICACC-S7-P104-2013) Boron Nitride Nanotube Growth on SiC Fiber Surfaces**

D. Santiago\*, J. Hurst, NASA Glenn Research Center, USA

**(ICACC-S7-P105-2013) Comparison of thin film WO<sub>3</sub> photoanodes prepared by different methods**

M. Sarnowska\*, P. Barczuk, CeNT, Warsaw University, Poland

**(ICACC-S7-P106-2013) Preparation and characterization of hydroxyapatite covered biocompatible TiC nanocomposite thin films**

K. Balazsi\*, I. Lukacs, Hungarian Academy of Sciences, Hungary; M. Vandrovcova, L. Bacakova, Institute of Physiology, Czech Republic; C. Balazsi, Hungarian Academy of Sciences, Hungary

**(ICACC-S7-P109-2013) Graphene-semiconductor hybrid materials: electronic and photophysical properties**

K. Ojha\*, M. Makkar, P. K. Chowdhury, A. K. Ganguli, Indian Institute of Technology, Delhi, India

**(ICACC-S7-P110-2013) Deposition and Modification of Semiconducting Metaloxides with Enhanced Photoelectrochemical Properties via PE-CVD**

A. Mettenboerger\*, A. P. Singh, P. Golus, S. Mathur, University of Cologne, Germany

**Posters****S11 Poster Session**

Room: Ocean Center

**5:00 PM****(ICACC-S11-P135-2013) Formation of S-phase layer on AISI 304 stainless steel by low pressure gas nitriding**

J. Kim, Hanbat National University, Republic of Korea; K. Moon, Korea Institute of Industrial Technology, Republic of Korea; Y. Kim\*, Hanbat National University, Republic of Korea

**(ICACC-S11-P136-2013) Fabrication of Highly Ordered Freestanding ZnO-based Nanostructure Arrays and its Application**

W. Kwack, H. Choi, S. Kwon\*, Pusan National University, Republic of Korea

**(ICACC-S11-P137-2013) PECVD of Ti-Ru-N nanocomposite films on stainless steel as bipolar plates for PEMFC**

W. Kwack, H. Choi, S. Kwon\*, Pusan National University, Republic of Korea

**(ICACC-S11-P138-2013) Influence of oxidation-reduction process on the low-pressure gas nitriding of stainless steel**

K. Moon\*, H. Park, C. Byun, KITECH, Republic of Korea

**(ICACC-S11-P139-2013) The effects of the elements (Ti, Cr, Mo, N, F) on the properties of DLC films prepared by PECVD process**

K. Moon\*, J. Kim, D. Jung, KITECH, Republic of Korea; J. Park, Hanyang university, Republic of Korea

**(ICACC-S11-P140-2013) Characteristic studies on the Zr-based metallic glass thin films by magnetron sputtering process**

C. Lee, S. Shin, J. Sun\*, K. Moon, Korea Institute of industrial technology, Republic of Korea

**(ICACC-S11-P141-2013) Residual stress and elastic properties of CrMoN films deposited by hybrid PVD**

Y. Oh\*, Y. Yang, KICET, Republic of Korea; I. Lyo, Hyundai &amp; Kia, Republic of Korea; S. Park, Hyundai Hysco, Republic of Korea; D. Lim, Korea University, Republic of Korea

**(ICACC-S11-P143-2013) PEO on Eco-Al as a tool for lightweight metal protection against corrosion and surface decoration**

J. Park\*, T. Hwang, KITECH, Republic of Korea

**(ICACC-S11-P144-2013) Study on the Probability of Gas selectivity on single device of Sol-gel prepared porous TiO<sub>2</sub> thin film by a concurrent AC/DC electrical investigation**

J. Park\*, T. Hwang, KITECH, Republic of Korea

**(ICACC-S11-P145-2013) Multi-phase nano composite coating for high power engine component**

I. Lyo\*, W. Hong, K. Choi, H. Kang, D. Han, KITECH, Republic of Korea

**(ICACC-S11-P146-2013) Tribological behaviors of ternary amorphous B-C-N coatings**

D. Kim\*, D. Jeong, Pusan National University, Republic of Korea; J. Park, Korea Institute of Science and Technology, Republic of Korea; K. Kim, Pusan National University, Republic of Korea

**(ICACC-S11-P147-2013) The characterization of MoN-Cu-Cr nanocomposite coatings deposited by magnetron sputtering process with single alloying target**

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

**(ICACC-S11-P148-2013) Enhancement of electrochemical properties of thin films containing composite nanoparticles synthesized from microemulsion medium**

M. Pyeon\*, T. Hwang, KITECH, Republic of Korea

## Posters

### S12 Poster Session

Room: Ocean Center

5:00 PM

**(ICACC-S12-P149-2013) Improved processing of carbon nanotube/magnesium alloy composites**

A. Goodarzi\*, H. Taylor, Harvard University, USA

**(ICACC-S12-P150-2013) ZrC-based composites for high temperature applications**

I. Hussainova\*, D. Yung, L. Kollo, N. Voltsihhin, R. Traksmaa, Tallinn University of Technology, Estonia

**(ICACC-S12-P152-2013) Processing and Characterization of Porous Ti2AlC with Controlled Porosity and Pore Size**

L. Hu\*, R. Benitez, S. Basu, I. Karaman, M. Radovic, Texas A&M University, USA

**(ICACC-S12-P153-2013) High temperature oxyacetylene torch testing and oxidation behavior of graphite, ZrB<sub>2</sub>, and ZrB<sub>2</sub>-SiC at temperatures greater than 1500°C**

P. Neff\*, University of Arizona, USA; A. Powell, Missouri University of Science & Technology, USA; L. S. Walker, E. L. Corral, University of Arizona, USA

**(ICACC-S12-P154-2013) A Testing Facility for Root Cause Analysis of Failure Under Extreme Temperatures**

J. Chatterjee, H. Chen, M. Mooty, J. Reali, J. R. Brenner\*, Florida Tech, USA

**(ICACC-S12-P155-2013) Spark Plasma Sintered ZrB<sub>2</sub>-SiC Composites**

R. Stadelmann\*, University of Central Florida, USA; V. M. Sglavo, University of Trento, Italy; N. Orlovskaya, University of Central Florida, USA

**(ICACC-S12-P172-2013) Mechanistic investigations in carbothermal reduction of 3 mol% yttria stabilized zirconia**

A. Sondhi\*, C. Morandi, University of North Texas, USA; S. Chattopadhyay, Argonne National Laboratory, USA; R. E. Reidy, T. W. Scharf, University of North Texas, USA

## Posters

### S13 Poster Session

Room: Ocean Center

5:00 PM

**(ICACC-S13-P156-2013) Ab initio molecular dynamics simulations of recoil events in thoria**

B. Liu\*, Oak Ridge National Laboratory, USA; H. Xiao, The University of Tennessee, USA; Y. Zhang, Oak Ridge National Laboratory, USA; W. J. Weber, The University of Tennessee, USA

**(ICACC-S13-P157-2013) Effects of Size and Geometry on the Equibiaxial Flexural Test of Fine Grained Nuclear Graphite**

C. Shih\*, Y. Katoh, Oak Ridge National Laboratory, USA; T. Takagi, Ibiben, Japan

**(ICACC-S13-P158-2013) Effect of Neutron Irradiation on Bonded Fiber Silicon Carbide Composite**

Y. Katoh\*, K. Ozawa, S. Kondo, Oak Ridge National Laboratory, USA; Y. Kawaharada, S. Higuchi, Toshiba, Japan

## Posters

### FS4 Poster Session

Room: Ocean Center

5:00 PM

**(ICACC-FS4-P163-2013) Nano Cr-doped crystalline composite in silicate glass host induced by CO<sub>2</sub> laser and thermal heat treatment for broadband applications**

J. Wang\*, Y. Chen, National Sun Yat-Sen University, Taiwan

**(ICACC-FS4-P164-2013) Design of Multi-Layered Ceramic Devices for Energy Harvesting**

J. Song\*, S. Kim, J. Jo, I. Kim, S. Jeong, M. Kim, Korea Electrotechnology Research Institute, Republic of Korea

**(ICACC-FS4-P165-2013) Fabrication of Nanostructured ZnO films for Plastic Dye-sensitized Solar Cells**

H. Utsunomiya\*, S. Ueno, S. Fujihara, Keio University, Japan

**(ICACC-FS4-P166-2013) Design and Fabrication of Smart-skin Structures with a Spiral Antenna**

D. Kim, J. Kim, W. Hwang\*, Pohang University of Science and Technology, Republic of Korea

**(ICACC-FS4-P167-2013) Evaluation of Compression Characteristics for Composite-Antenna-Structures**

J. Kim, D. Kim, D. Shin, W. Park, W. Hwang\*, Pohang University of Science and Technology, Republic of Korea

## Posters

### ECSA Poster Session

Room: Ocean Center

5:00 PM

**(ICACC-ECSA-P168-2013) Sol-Gel Synthesis of Mullite Starting from Different Inorganic Precursors**

L. Tellez-Jurado, R. M. Arévalo-Hernández, Universidad Politécnica de Victoria, Mexico, Universidad Politécnica de Victoria, Mexico; ESIQIE-IPN, Mexico; E. Rocha\*, Universidad Politécnica de Victoria, Mexico

**(ICACC-ECSA-P169-2013) Alumina Ceramics Reinforced with Silver Particles**

E. Refugio-García, M. Gaeta-Conchas, Universidad Autónoma Metropolitana, Mexico; J. G. Miranda-Hernández, Universidad Autónoma del Estado de México, Mexico; E. Rocha\*, Universidad Politécnica de Victoria, Mexico

**(ICACC-ECSA-P170-2013) Physical Properties of the Sr<sub>4</sub>Al<sub>6</sub>O<sub>12</sub>SO<sub>4</sub> Ceramic Compound**

J. A. Rodríguez-García, E. Rocha\*, J. López-Hernández, E. Martínez-Peña, Universidad Politécnica de Victoria, Mexico; J. M. Almanza-Robles, J. Torres-Torres, CINVESTAV, Mexico

**(ICACC-ECSA-P171-2013) Mechanism of the carbothermal synthesis of MgAl<sub>2</sub>O<sub>4</sub>-SiC refractory composite powders**

H. Zhu\*, H. Duan, W. Yuan, C. Deng, Wuhan University of Science and Technology, China

## Thursday, January 31, 2013

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

#### Tribological Performance and Impact Testing of Ceramics and Composites

Room: Coquina Salon D

Session Chairs: Jianguang Sun, Argonne National Laboratory; Oyelayo Ajayi, Argonne National Lab

8:00 AM

**(ICACC-S1-054-2013) Tribological Performance of Carbon-Ceramics Composite Materials**

A. Oyelayo\*, C. Lorenzo-Martin, S. Torrel, D. Singh, Argonne National Lab, USA; L. Manocha, G. Prasad, Sardar Patel University, India

8:20 AM

**(ICACC-S1-055-2013) Tribological Properties of Alumina/Zirconia Composites With and Without h-BN Phases**

L. Xue\*, Timken, USA; G. L. Doll, University of Akron, USA

8:40 AM

**(ICACC-S1-056-2013) The Sliding Wear Behaviour of TiC-316L Stainless Steel Composites**

C. C. Onuoha, Z. N. Farhat, G. J. Kipourous, K. P. Plucknett\*, Dalhousie University, Canada

**9:00 AM****(ICACC-S1-057-2013) Tribological profile of binderless niobium carbide**

M. Stuart, CBMM Companhia Brasileira de Metalurgia e Mineração, Brazil; K. Mohrbacher, Niobelcon BV, Belgium; M. Woydt\*, BAM Federal Institute for Materials Research and Testing, Germany

**9:20 AM****(ICACC-S1-058-2013) Comprehensive ablation characteristics of ceramic fibers impregnated rubber composites**

N. Iqbal\*, National University of Sciences and Technology (NUST), Pakistan; M. Khan, National University of Sciences and Technology (NUST), Pakistan; National University of Sciences and Technology (NUST), Pakistan; National University of Sciences and Technology (NUST), Pakistan; S. Sagar, A. Maqsood, National University of Sciences and Technology (NUST), Pakistan

**9:40 AM****Break****10:00 AM****(ICACC-S1-059-2013) Use of NDE and Health Monitoring Techniques to Assess High-Velocity Impact Performance of Various SiC/SiC Composites**

C. R. Baker\*, G. N. Morscher, University of Akron, USA; A. L. Gyekenyesi, Ohio Aerospace Institute, USA; C. Faucett, S. R. Choi, Naval Air Systems Command, USA

**10:20 AM****(ICACC-S1-060-2013) Multilayer Ceramic Composite Armor Design and Impact Tests**

F. Elaldi\*, University of Baskent, Turkey

**S3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology****Processing/Performance**

Room: Coquina Salon H

Session Chairs: Jeff Stevenson, Pacific Northwest National Laboratory; Jong Shik Chung, POSTECH

**8:00 AM****(ICACC-S3-035-2013) Recent developments on direct ethanol solid oxide fuel cells (Invited)**

F. C. Fonseca\*, S. D. Nobrega, IPEN, Brazil; F. B. Noronha, INT, Brazil; P. Gelin, IRCÉLYON, France; S. Georges, M. C. Steil, LEPMI, France

**8:30 AM****(ICACC-S3-036-2013) Solid oxide fuel cell activities at POSTECH (Invited)**

J. Chung\*, N. M. Sammes, POSTECH, Republic of Korea

**9:00 AM****(ICACC-S3-037-2013) Planar metal supported solid oxide fuel cells fabricated with ultra-thin YSZ membranes**

C. O. Belda\*, E. Dietzen, M. Kusnezoff, N. Trofimenko, A. Michaelis, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany

**9:20 AM****(ICACC-S3-038-2013) Metal supported SOFCs by Freeze Tape Casting**

P. Wei, M. Ren, McMaster University, Canada; S. W. Sofie, Montana University, USA; A. Petric\*, McMaster University, Canada

**9:40 AM****Break****10:00 AM****(ICACC-S3-039-2013) Solid Oxide Fuel Cell Materials Development at PNNL (Invited)**

J. Stevenson\*, Y. Chou, J. Hardy, O. Marina, D. Reed, J. Choi, E. Stephens, C. Coyle, J. Templeton, R. Scott, Pacific Northwest National Laboratory, USA

**10:30 AM****(ICACC-S3-041-2013) Anode-Supported Solid Oxide Fuel Cells with LaGaO<sub>3</sub>-based Electrolyte Film Fabricated by a Simple One-step Co-firing Process**

Y. Chen\*, Y. Gong, Z. Yang, University of South Carolina, USA; Z. Yang, China University of Mining & Technology, China; J. Bunch, F. Chen, University of South Carolina, USA; M. Han, China University of Mining & Technology, China

**10:50 AM****(ICACC-S3-042-2013) Electrochemical Performance and Redox Cycling Tolerance of an Infiltrated Tubular Fuel Cell**

A. R. Hanifi, A. Torabi\*, T. H. Etsell, University of Alberta, Canada; P. Sarkar, Alberta Innovates - Technology Futures, Canada

**11:10 AM****(ICACC-S3-043-2013) The development of plasma sprayed metal-supported solid oxide fuel cells at Institute of Nuclear Energy Research**

C. Chang\*, C. Hwang, C. Tsai, S. Nien, C. Chuang, S. Cheng, S. Wu, Institute of Nuclear Energy Research, Taiwan

**11:30 AM****(ICACC-S3-040-2013) Extrusion and optimization of tubular IT-SOFCs**

A. Azzolini\*, V. M. Sglavo, G. Fantini, E. Vitorbi, University of Trento, Italy

**S5: Next Generation Bioceramics and Biocomposites****Medical Ceramics**

Room: Coquina Salon C

Session Chairs: Kurosch Rezwani, Advanced Ceramics, University of Bremen; Christian Bonhomme, UPMC

**8:00 AM****(ICACC-S5-001-2013) Fluorescently labeled metal oxide colloidal particles for nanotoxicological in vitro screening (Invited)**

K. Rezwani\*, Advanced Ceramics, University of Bremen, Germany

**8:20 AM****(ICACC-S5-002-2013) Theranostics Based on Hybrid Nanoparticles for Early Cancer Detection and Treatment (Invited)**

M. Wang\*, S. Li, The University of Hong Kong, Hong Kong; L. Ren, Xiamen University, China

**8:40 AM****(ICACC-S5-003-2013) Bioactive Glass and Ceramic Scaffolds for Bone Regeneration (Invited)**

M. N. Rahaman\*, Missouri University of Science & Technology, USA

**9:00 AM****(ICACC-S5-004-2013) Nature-inspired Materials Design and Manufacturing (Invited)**

X. Li\*, University Of South Carolina, USA

**9:20 AM****(ICACC-S5-005-2013) Revisiting electro-spinning procedure for preparation of biologically active fiber mats (Invited)**

H. Yoshihara, Y. Shirotsaki, Okayama University, Japan; S. Chen, N. Hanagata, National Institute of Materials Science, Japan; S. Hayakawa, Okayama University, Japan; A. Stambourlis, University of Birmingham, United Kingdom; Y. Nakamura, A. Osaka\*, Okayama University, Japan

**9:40 AM****Break****10:00 AM****(ICACC-S5-006-2013) New synthetic biomineralization media for the in vitro testing of synthetic biomaterials**

A. Tas\*, University of Illinois at Urbana-Champaign, USA; N. Temizel, G. Giriskan, Yeditepe University, Turkey

**10:20 AM**

**(ICACC-S5-007-2013) Spectroscopy and simulations: towards a better understanding of complex biomaterials (Invited)**  
C. Bonhomme\*, UPMC, France

**10:40 AM**

**(ICACC-S5-008-2013) X-ray imaging enhancement using nanoscience (Invited)**  
J. Johnson\*, R. Leonard, UTSl, USA; C. Alvarez, Northwestern University, USA; R. Lubinsky, SUNY, USA; S. Gray, UTSl, USA; A. Petford-Long, Northwestern University, USA; S. Schweizer, Fraunhofer Institute, Germany; C. Johnson, UTSl, USA

**11:00 AM**

**(ICACC-S5-009-2013) Biomimetic apatites : surface state and potential interfacial issues (Invited)**  
C. Drouet\*, N. Vandecandelaere, C. Rey, CIRIMAT Carnot Institute, France

**11:20 AM**

**(ICACC-S5-010-2013) Evaluation of Bioactive Borate Glass Fibers In-vitro and In-vivo for Wound Care Applications**  
S. Jung\*, Mo-Sci Corporation, USA

## S7: 7th International Symposium on Nanostructured Materials and Nanocomposites

### Innovative Processing of Functional Materials

Room: Coquina Salon B

Session Chairs: Oliver Diwald, University of Erlangen Nürnberg;  
Gunnar Westin, Uppsala University

**8:00 AM**

**(ICACC-S7-049-2013) Nanoparticle Surface Design for Controlling their Dispersion Stability and Processing Functional Composite Materials (Invited)**  
M. Iijima\*, H. Kamiya, Tokyo University of Agriculture and Technology, Japan

**8:30 AM**

**(ICACC-S7-050-2013) Structure-Property Relations in Designing Functional Nanomaterials and Nanocomposites**  
E. V. Timofeeva\*, Argonne National Laboratory, USA; M. R. Moravek, Argonne National Laboratory, USA; D. Singh, Argonne National Laboratory, USA; W. Yu, Argonne National Laboratory, USA; D. France, Argonne National Laboratory, USA

**8:50 AM**

**(ICACC-S7-051-2013) Boron Nitride Nanotube Reinforcement for High Temperature Composite Applications**  
J. Hurst\*, D. Santiago, C. Hung, NASA Glenn Research Center, USA

**9:10 AM**

**(ICACC-S7-052-2013) Nanocomposite Films With Low-Field Magnetoresistance or Magnetoelectric Properties (Invited)**  
M. Jain\*, University of Connecticut, USA

**9:40 AM**

Break

### Surfaces and Controlled Interface Properties

Room: Coquina Salon B

Session Chairs: Menka Jain, University of Connecticut; Motoyuki Iijima, Tokyo University of Agriculture and Technology

**10:00 AM**

**(ICACC-S7-053-2013) Chemical and Thermal Effects on Phase Evolution and Cation Gradients in Solution-Derived Thin Film Ferroelectrics (Invited)**  
G. Brennecke\*, J. Ihlefeld, Sandia National Laboratories, USA; K. Nittala, University of Florida, USA; K. Meyer, New Mexico Institute of Mining and Technology, USA; R. Wilkerson, Missouri University of Science and Technology, USA; S. Mhin, J. Jones, University of Florida, USA

**10:30 AM**

**(ICACC-S7-054-2013) Interface Controlled Property Changes of Titanate Nanostructures (Invited)**  
M. J. Elser, A. K. Sternig, B. Schuerer, W. Peukert, O. Diwald\*, University of Erlangen Nürnberg, Germany

**11:00 AM**

**(ICACC-S7-055-2013) Solution based processing of doped zinc oxide and titanium dioxide as transparent conducting materials**  
K. Elen\*, H. Damm, A. Kelchtermans, K. Schellens, A. Hardy, M. K. Van Bael, Hasselt University - imomec, Belgium

**11:20 AM**

**(ICACC-S7-057-2013) All Inkjet-printed Field Effect Transistors with p-type CuO Nanoparticles Ink**  
M. Vaseem\*, A. Hong, Y. Hahn, Chonbuk National University, Republic of Korea

**11:40 AM**

**(ICACC-S7-056-2013) Structural and magnetic properties of Zn1-xNi<sub>x</sub>O diluted magnetic semiconductors synthesized by a polymer precursor method**  
J. Jadhav, M. Patange, S. Biswas\*, The LNM Institute of Information Technology, India

## S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

### Novel Characterization Methods and Lifetime Assessment I

Room: Coquina Salon F

Session Chair: Guo-Jun Zhang, Shanghai Institute of Ceramics

**8:00 AM**

**(ICACC-S12-030-2013) High Temperature Oxidation Induced Crack Healing of MAX phases (Invited)**  
W. Sloof\*, L. Shen, Delft University of Technology, Netherlands; S. Li, Beijing Jiaotong University, China; G. Song, C. Kwakernaak, S. van der Zwaag, Delft University of Technology, Netherlands

**8:30 AM**

**(ICACC-S12-031-2013) Synthesis and characterization of Ti<sub>2</sub>Al(C(1-x)N<sub>x</sub>)<sub>y</sub> MAX phase solid solutions**  
W. Yu, V. Gauthier-Brunet, C. Tomas, T. Cabioc'h, S. Dubois\*, Institut PPRIME, France

**8:50 AM**

**(ICACC-S12-032-2013) Critical analysis of effects from geometry and size on oxidation behavior of ultra-high temperature ceramics in tube and thermogravimetric furnace**  
M. Miller-Oana\*, L. Walker, E. Corral, University of Arizona, USA

**9:10 AM**

**(ICACC-S12-033-2013) Effects of hyperthermal and thermal oxygen beam exposures on oxidation behavior of ultra-high temperature ceramics**  
M. Miller-Oana\*, L. Walker, University of Arizona, USA; V. Murray, T. Minton, Montana State University, USA; E. Corral, University of Arizona, USA

**9:30 AM**

**(ICACC-S12-034-2013) XRD and TG-DSC Analysis of the Silicon Carbide-Palladium Reaction**  
M. Gentile\*, P. Xiao, The University of Manchester, United Kingdom

**9:50 AM**

Break

## Novel Characterization Methods and Lifetime Assessment II

Room: Coquina Salon F

Session Chair: Wim G. Sloof, Delft University of Technology

**10:00 AM**

### (ICACC-S12-035-2013) High-Temperature Strength Measurements and Arc-Jet Testing of Cf-HfB<sub>2</sub> UHTC Composites

A. Paul, J. Binner\*, B. Vaidyanathan, Loughborough University, United Kingdom; A. Heaton, P. Brown, Dstl, United Kingdom

**10:30 AM**

### (ICACC-S12-037-2013) Repeatability of Measurements and Initial Stage Oxidation in ZrB<sub>2</sub>-30vol%SiC

K. N. Shugart\*, E. J. Opila, University of Virginia, USA

**10:50 AM**

### (ICACC-S12-038-2013) Studies on Oxidation of C-ZrB<sub>2</sub>-SiC at 1800°C Using a Novel Ultra-high Temperature Oxidation Testing Apparatus

Z. Gao\*, J. Xu, M. Li, Institute of Metal Research, Chinese Academy of Sciences, China

**11:10 AM**

### (ICACC-S12-039-2013) In-situ observation of the growth kinetics of SiO<sub>2</sub> during passive oxidation of SiC under various Ar/O<sub>2</sub>, Ar/CO<sub>2</sub>, Ar/CO<sub>2</sub>/O<sub>2</sub> gas mixtures at very high temperatures

F. Teyssandier\*, M. Brisebourg, F. Rebillat, CNRS-LCTS, France

**11:30 AM**

### (ICACC-S12-036-2013) Effect of air exposure temperature and time on room temperature strength of ZrB<sub>2</sub> and ZrB<sub>2</sub>-SiC composite

M. Patel\*, J. J. Reddy, V. V. Bhanu Prasad, Defence Metallurgical Research Laboratory, India; V. Jayaram, Indian Institute of Science, India; A. A. Ghokhale, Defence Metallurgical Research Laboratory, India

## S13: Advanced Ceramics and Composites for Sustainable Nuclear Energy and Fusion Energy

### Ceramic Technology for Light Water Reactor Fuels

Room: Ponce DeLeon

Session Chairs: Lance Snead, ORNL; Shannon Bragg-Sitton, Idaho National Laboratory

**8:00 AM**

### (ICACC-S13-010-2013) Advanced LWR Nuclear Fuel Cladding Development Status (Invited)

S. Bragg-Sitton\*, Idaho National Laboratory, USA

**8:30 AM**

### (ICACC-S13-011-2013) Probabilistic Failure Analysis for Wound Composite Ceramic Cladding Assembly

J. Hemrick\*, E. Lara-Curzio, Oak Ridge National Laboratory, USA

**8:50 AM**

### (ICACC-S13-012-2013) Spark Plasma Sintering of high Thermal Conductivity UO<sub>2</sub> and UO<sub>2</sub>-SiC Composites

G. Subhash\*, L. Ge, J. Tulenko, S. Yeo, R. Baney, University of Florida, USA

**9:10 AM**

### (ICACC-S13-013-2013) Enhanced Thermal Conductivity of Uranium Dioxide-Silicon Carbide Composite Fuel

S. Yeo\*, E. McKenna, R. Baney, G. Subhash, J. Tulenko, University of Florida, USA

**9:30 AM**

Break

**9:50 AM**

### (ICACC-S13-015-2013) Accident Tolerance of SiC-matrix based Fuels (Invited)

L. Snead\*, K. Terrani, T. Cheng, K. L. More, ORNL, USA

**10:20 AM**

### (ICACC-S13-016-2013) Silicon Carbide Recession Kinetics in High-Pressure Steam at Elevated Temperature

T. Cheng\*, P. F. Tortorelli, K. L. More, Oak Ridge National Lab, USA

**10:50 AM**

### (ICACC-S13-018-2013) High Temperature Steam Corrosion of Cladding for Nuclear Applications: II. Experimental

K. M. McHugh, J. E. Garnier, S. Rashkeev, M. V. Glazoff, G. W. Griffith, S. M. Bragg-Sitton\*, Idaho National Laboratory, USA

**11:10 AM**

### (ICACC-S13-019-2013) NITE SiC Processing for Nuclear Applications

K. Terrani\*, J. Kiggans, Y. Katoh, L. Snead, Oak Ridge National Laboratory, USA

## FS1: Geopolymers and Chemically Bonded Ceramics

### Microstructure, Synthesis and Processing

Room: Coquina Salon A

Session Chair: Hubert Rahier, Vrije Universiteit Brussel

**8:00 AM**

### (ICACC-FS1-001-2013) Influence of the Interaction between Various Metakaolins and Alkaline Solutions on Geopolymer Formation (Invited)

S. Rossignol\*, CEC GEMH ENSCI, France

**8:30 AM**

### (ICACC-FS1-002-2013) The Effects of Water Content and Chemical Composition on the Structure and Compressive Strength of K- and Na- Activated Geopolymers (Invited)

M. J. Westwick, Texas A&M University, USA; M. Lizcano, NASA Glenn Research Center, USA; M. Radovic\*, Texas A&M University, USA

**9:00 AM**

### (ICACC-FS1-003-2013) Mechanical strength development of geopolymer binder: the effect of quartz content

C. H. Rüscher\*, Leibniz University Hannover, Germany; M. H. Gougazeh, Tafila Technical University, Jordan; A. Ritzmann, GNF e.V., Germany; A. Schulz, Leibniz University Hannover, Germany

**9:20 AM**

### (ICACC-FS1-004-2013) What is the Role of Calcium in Geopolymers?

G. M. Canfield\*, J. Eichler, K. Griffith, J. Hearn, Universal Technology Corporation, USA

**9:40 AM**

Break

**10:00 AM**

### (ICACC-FS1-005-2013) The role of SiO<sub>2</sub> & Al<sub>2</sub>O<sub>3</sub> on the properties of geopolymers with and without Calcium (Invited)

P. De Silva\*, Australian Catholic University, Australia

**10:30 AM**

### (ICACC-FS1-006-2013) Synthesis of Thermostable Geopolymer from Waste Glass (Invited)

J. Zhai, Z. Sun\*, D. Tao, H. Cui, Q. Li, Nanjing University, China

**Porosity I**

Room: Coquina Salon A

Session Chair: Sylvie Rossignol, CEC GEMH ENSCI

**11:00 AM****(ICACC-FS1-007-2013) Geopolymer Mesoporosity Control Using Alkoxysilane Additives (Invited)**

B. E. Glad\*, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**11:30 AM****(ICACC-FS1-008-2013) Effective thermal conductivity of porous inorganic polymer cements: effects of the bulk composition and the microstructure (Invited)**

E. Kameu\*, University of Modena, Italy; B. Nait-Ali, Centre Europeen de la Céramique, France; M. C. Bignozzi, University of Bologna, Italy; C. Leonelli, University of Modena, Italy; S. Rossignol, D. Smith, Centre Europeen de la Céramique, France

**FS4: Advanced Ceramic Materials and Processing for Photonics and Energy****Advanced and Nanostructured Materials for Photonics**

Room: Oceanview

Session Chairs: Giovanni Fanchini, University of Western Ontario; Fiorenzo Vetrone, Université du Québec

**8:00 AM****(ICACC-FS4-002-2013) Surface ablation of dielectrics with forefront laser technology (Invited)**

F. Legare\*, INRS, Canada; B. Chimier, O. Uteza, N. Sanner, M. Sentis, Université de la Méditerranée, France; P. Lassonde, F. Vidal, J. Kieffer, INRS, Canada

**8:20 AM****(ICACC-FS4-003-2013) Two photon polymerization of organically modified ceramic materials for biomedical applications (Invited)**

R. Narayan\*, UNC/NCSU Joint Department of Biomedical Engineering, USA

**8:40 AM****(ICACC-FS4-004-2013) Towards ZnO large scale controlable nanostructuring : UV photonics (Invited)**

G. Lerondel\*, K. Nomenyo, R. Aad, H. Kadiri, R. Salas Montiel, S. Kostcheev, C. Couteau, A. Gokarna, University of Technology of Troyes, France

**9:00 AM****(ICACC-FS4-005-2013) Calcium-barium-niobate thin-film synthesis and etching for the development of electro-optical waveguide modulators (Invited)**

M. Chaker\*, S. Vigne, E. Mortazy, INRS, Canada

**9:20 AM****(ICACC-FS4-006-2013) Multiphoton Excited Nanoparticles for Luminescence Nanothermometry in Living Cells (Invited)**

F. Vetrone\*, Université du Québec, Canada

**9:40 AM****Break****10:00 AM****(ICACC-FS4-030-2013) THz Faraday rotation in magnetic nanosuspensions: towards broadband isolators in the THz regime (Invited)**

M. Shalaby, INRS-EMT, Canada; M. Peccianti, Institute for Complex Systems-CNR, Italy; Y. Ozturk, Ege University, Turkey; M. Clerici, I. Al-Naib, INRS-EMT, Canada; L. Razzari, Italian Institute of Technology, Italy; T. Ozaki, INRS-EMT, Canada; A. Mazhorova, M. Skorobogatyi, École Polytechnique de Montréal, Canada; R. Morandotti\*, INRS-EMT, Canada

**10:20 AM****(ICACC-FS4-007-2013) Hierarchically structured ZnO photoanodes for highly efficient dye sensitized solar cells**

I. Concina\*, CNR-IDASC SENSOR Laboratory &amp; Brescia University, Italy; N. Memarian, S. M. Rozati, University of Guilan, Islamic Republic of Iran; G. Sberveglieri, A. Vomiero, CNR-IDASC SENSOR Laboratory &amp; Brescia University, Italy

**10:40 AM****(ICACC-FS4-009-2013) Low-index waveguides and their applications**

A. Horth, N. Quitoiano\*, McGill University, Canada

**Engineering Ceramics Summit of the Americas****Ceramic Education, Training, and Collaboration**

Room: Coquina Salon G

Session Chairs: Richard Sisson, Worcester Polytechnic Institute; Enrique Rocha, Universidad Politécnica de Victoria

**8:00 AM****(ICACC-ECSA-007-2013) New Imperatives in Materials Processing Education (Invited)**

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

**8:30 AM****(ICACC-ECSA-008-2013) Integrating Ceramic Education and Research in an Undergraduate Applied Manufacturing Engineering Program (Invited)**

R. Asthana\*, University of Wisconsin-Stout, USA

**8:50 AM****(ICACC-ECSA-009-2013) Shaping the Ceramics Researchers of Tomorrow Through a Continuum of STEM Experiences (Invited)**

A. Heyward\*, Ohio Aerospace Institute, USA

**9:20 AM****(ICACC-ECSA-010-2013) Overview of Scientific Issues and Applications of Ceramics-Glasses in the Silica-Alumina Phase System (Invited)**

S. Risbud\*, UC Davis, USA

**9:50 AM****Break****10:10 AM****(ICACC-ECSA-011-2013) The Rare Earth Elements among the Critical Elements (Invited)**

G. Meyer\*, University of Cologne, Germany

**10:40 AM****(ICACC-ECSA-012-2013) Commercialising University Research: Thoughts on the Challenges Based on Experience Gained in the Field of Ceramic Processing in the UK (Invited)**

J. Binner\*, Loughborough University, United Kingdom

**11:10 AM****(ICACC-ECSA-013-2013) Iron Phosphate Glasses and Melts- A US-Brazil Research Collaboration on Novel Materials for Nuclear Waste Remediation (Invited)**

R. K. Brow\*, M. E. Schlesinger, Missouri S&amp;T, USA; E. D. Zanotto, Federal University of Sao Carlos, Brazil

**11:40 AM****(ICACC-ECSA-014-2013) Production of Al<sub>2</sub>O<sub>3</sub>/Ti/TiO<sub>2</sub> Ceramics by Means of Oxidant in Air of Al<sub>2</sub>O<sub>3</sub>/Ti Ceramics**

S. J. Esparza, E. Rocha\*, J. A. Rodríguez-García, Universidad Politécnica de Victoria, Mexico; J. G. Miranda-Hernández, Universidad Autónoma del Estado de México, Mexico; E. Refugio-García, M. Gaeta-Conchas, Universidad Autónoma Metropolitana, Mexico

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

### Environmental Effects on Mechanical Performance of CMCs

Room: Coquina Salon D

Session Chairs: Marina Ruggles-Wrenn, Air Force Institute of Technology; Greg Morscher, University of Akron

**1:30 PM**

#### (ICACC-S1-061-2013) Modeling of Oxidation Effects on Mechanical and Thermal Behavior of ZrB<sub>2</sub>-20vol%SiC Ceramic at High Temperature

L. R. Dharani, J. Wei, K. Chandrashekhara, G. Hilmas, W. G. Fahrenholtz\*, Missouri University of Science and Technology, USA

**1:50 PM**

#### (ICACC-S1-062-2013) Fatigue of Hi Nicalon filaments at elevated temperature: size and stress effects on rupture times

J. L. Lamon\*, CNRS, France; M. R'illi, University of Lyon, France

**2:10 PM**

#### (ICACC-S1-063-2013) Creep Behavior of Hi-Nicalon S Fiber Tows at Elevated Temperatures in Air and in Steam

M. Ruggles-Wrenn\*, B. Steffens, T. Shillig, Air Force Institute of Technology, USA; G. Fair, R. Hay, Air Force Research Laboratory, USA

**2:30 PM**

#### (ICACC-S1-064-2013) Creep Behavior in Interlaminar Shear of a Hi-NICALON/SiC Ceramic Matrix Composite at 1200° C in Air and in Steam

M. T. Pope, M. Ruggles-Wrenn\*, Air Force Institute of Technology, USA

**2:50 PM**

#### (ICACC-S1-065-2013) Mechanical properties degradation of the YSZ (plasma sprayed coatings) under humidity atmosphere

G. Leclercq\*, S. Lambert, H. Guillaume, CEA, France; C. Jerome, O. Christian, INSA, France; T. Christophe, CEA, France

**3:10 PM**

Break

**3:30 PM**

#### (ICACC-S1-066-2013) Influence of oxidation on the mechanical properties of oxide fibre-reinforced ceramic composites with precursor-derived mullite-SiOC matrix

K. Tushtev, E. Volkman, L. Evangelista Lima, T. Schumacher, University of Bremen, Germany; D. Koch, German Aerospace Center, Germany; C. Wilhelm, EADS, Germany; K. Rezwani\*, University of Bremen, Germany

**3:50 PM**

#### (ICACC-S1-068-2013) Hydration of ZrW<sub>2</sub>O<sub>8</sub>

M. Ahmad\*, M. Akinc, Iowa State University, USA

**4:10 PM**

#### (ICACC-S1-069-2013) Subcritical Crack Growth in Low Temperature Co-fired Ceramics: effect of humidity and temperature on the biaxial strength

R. Bermejo\*, Montanuniversitaet Leoben, Austria; C. Krautgasser, Materials Center Leoben Forschung GmbH, Austria; P. Supancic, R. Danzer, Montanuniversitaet Leoben, Austria

**4:30 PM**

#### (ICACC-S1-070-2013) Slow crack growth in silicon carbide

L. J. Vandeperre\*, N. Al Nasiri, F. Giuliani, E. Saiz, Imperial College London, United Kingdom

**4:50 PM**

#### (ICACC-S1-071-2013) Application of SiC/SiC composite to thruster for upper stage liquid fuel engine

R. Kitazawa\*, K. Goto, Japan Aerospace Exploration Agency, Japan; Y. Yoshida, Mitsubishi Heavy Industries, Japan; T. Fukunaga, Kyoto University, Japan; S. Tokudome, T. Yagishita, Japan Aerospace Exploration Agency, Japan

## S3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology

### Interconnects/Coatings

Room: Coquina Salon H

Session Chairs: Ulrich Vogt, Empa; Yeong-Shyung Chou, Pacific Northwest National Lab

**1:30 PM**

#### (ICACC-S3-044-2013) Analysis of the corrosion behaviour of steel interconnects and coatings in solid oxide electrolysis cells (Invited)

U. F. Vogt\*, J. Kim, Y. Choi, K. Couturier, A. Zuetzel, Empa, Switzerland; K. Oh, Seoul National University, Republic of Korea

**2:00 PM**

#### (ICACC-S3-047-2013) Phase transformation and thermal-electrical properties of Lanthanum Chromite

S. Gupta\*, M. K. Mahapatra, P. Singh, University of Connecticut, USA

**2:20 PM**

#### (ICACC-S3-049-2013) Effect of additives on conductivity of copper manganese spinel for SOFC interconnects

S. Joshi\*, McMaster University, Canada; R. Lawcock, Stackpole International, Canada; A. Petric, McMaster University, Canada

**2:40 PM**

#### (ICACC-S3-051-2013) Advanced Conductive (MnCo)<sub>3</sub>O<sub>4</sub> Coating on SOFC Interconnect Frames with One-Step Heat Treatment

J. Choi\*, J. W. Stevenson, R. C. Scott, M. Chou, Pacific Northwest National Lab, USA

**3:00 PM**

Break

**3:20 PM**

#### (ICACC-S3-050-2013) Long-term evaluation of surface-treated (Mn,Co) spinel-coated AISI441 interconnect for SOFC application

Y. Chou\*, J. Choi, J. Stevenson, E. Stephens, E. Mast, Pacific Northwest National Lab, USA

**3:40 PM**

#### (ICACC-S3-052-2013) Electrodeposition of Spinel Coatings on SOFC Interconnects

X. D. Michaud\*, McMaster University, Canada; R. Lawcock, Stackpole International, Canada; A. Petric, McMaster University, Canada

**4:00 PM**

#### (ICACC-S3-053-2013) Protective Oxide Coatings for the High Temperature Protection of Metallic SOFC Components

N. J. Kidner\*, M. Seabaugh, K. Chenault, S. Ibanez, K. Smith, R. Underhill, L. Thrun, NexTech Materials, USA

**4:20 PM**

#### (ICACC-S3-054-2013) Chromium evaporation from alumina and chromia forming alloys used in Solid oxide fuel cell-Balance of Plant applications

L. Ge\*, University of Connecticut, USA; P. Singh, University of Connecticut, USA; M. Brady, Oak Ridge National Laboratory, USA; E. Sun, University of Connecticut, USA

**4:40 PM**

#### (ICACC-S3-055-2013) Processing effects on phase and microstructure of plasma sprayed Strontium doped Lanthanum Manganite

Y. Chen, S. Jung Han\*, S. Sampath, Stony Brook University, USA

**5:00 PM**

#### (ICACC-S3-045-2013) Novel Composite Interconnect for SOFC

S. Somov\*, Solid Cell Inc, USA; S. Ghosh, RocCera LLC, USA; O. A. Graeve, J. P. Kelly, M. Alberga, Alfred University, USA

**S4: Armor Ceramics****Synthesis and Processing II**

Room: Crystal Ballroom

Session Chair: Robert Pavlacka, U.S. Army Research Laboratory

**1:20 PM****(ICACC-S4-048-2013) Microstructure and mechanical property of nanocrystalline boron carbide ceramics (Invited)**

Y. Shinoda\*, T. Akatsu, F. Wakai, Tokyo Institute of Technology, Japan

**1:50 PM****(ICACC-S4-049-2013) Comparison of armor ceramics made by spark plasma sintering (SPS) and pressureless sintering**

P. Karandikar\*, S. Wong, M. Duke, M Cubed Technologies, Inc., USA; R. Haber, M. Vu, Rutgers University, USA; J. Singh, Pennsylvania State University, USA

**2:10 PM****(ICACC-S4-050-2013) Pressureless sintering of silicon carbide – boron carbide composites**

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

**2:30 PM****(ICACC-S4-051-2013) Synthesis and Characterization of Submicron-Grained Boron Carbide**

C. Haines\*, D. Martin, K. Mills, R. Sadangi, D. Kapoor, US Army ARDEC, USA

**2:50 PM****Break****3:10 PM****(ICACC-S4-052-2013) Rapid Carbothermal Reduction Synthesis of Boron Carbide**

M. F. Toksoy\*, W. Rafaniello, R. A. Haber, S. L. Miller, Rutgers University, USA

**3:30 PM****(ICACC-S4-053-2013) The Role of Interfaces on the Sintering, Microstructure Evolution, and Properties of Hot-Pressed Transparent MgAl<sub>2</sub>O<sub>4</sub> Spinel**

M. Rubat du Merac, Technical University Darmstadt, Germany; I. Reimanis\*, Colorado School of Mines, USA; H. Kleebe, M. Müller, Technical University Darmstadt, Germany

**Non-Destructive Evaluation**

Room: Crystal Ballroom

Session Chair: Matthew Bratcher, U.S. Army Research Laboratory

**3:50 PM****(ICACC-S4-054-2013) Ultrasonic Nondestructive Characterization of Spark Plasma Sintered Silicon Carbide Microstructure**

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

**4:10 PM****(ICACC-S4-055-2013) Nondestructive Characterization of Low Velocity Impact Damage in Protective Ceramic Components**

R. Brennan\*, W. Green, US Army Research Laboratory, USA

**4:30 PM****(ICACC-S4-056-2013) Evaluation of Low Velocity Strike Damage in Ceramic Tile Modules Using a Microwave Interference Scanning System**

W. H. Green\*, R. Brennan, U.S. Army Research Laboratory, USA

**4:50 PM****(ICACC-S4-057-2013) Portable Automated Microwave Interferometry Imaging in Complex Ceramics**

K. Schmidt\*, J. Little, Evisive, Inc., USA; W. Ellingson, ERC Company, USA; L. P. Franks, US Army Tank Automotive Research Development and Engineering Center, USA; W. H. Green, US Army Research Laboratory, USA

**S5: Next Generation Bioceramics and Biocomposites****Advanced Bioceramics**

Room: Coquina Salon C

Session Chairs: Min Wang, The University of Hong Kong; Peter Ma, University of Michigan; Tomaz Kosmac, Institute Jozef Stefan

**1:30 PM****(ICACC-S5-012-2013) Novel Electrospun Bicomponent Scaffolds for Nerve Tissue Repair**

C. Liu, X. Zhang, M. Wang\*, The University of Hong Kong, Hong Kong

**1:50 PM****(ICACC-S5-017-2013) Stimuli-responsive smart hybrid capsules for on-demand delivery system (Invited)**

K. Katagiri\*, Hiroshima University, Japan

**2:10 PM****(ICACC-S5-014-2013) Maturation of brushite and preparation of brushite micro-granules**

A. Tas\*, A. S. Madden, P. R. Larson, M. K. Jain, M. R. Kendall, M. A. Miller, University of Oklahoma, USA

**2:30 PM****(ICACC-S5-015-2013) Mineralized Tissue Regeneration Using Biomimetic Scaffolds and Stem Cells (Invited)**

P. X. Ma\*, University of Michigan, USA

**2:50 PM****(ICACC-S5-016-2013) Tantalum-based Diffusion Coating for Increasing the Biocompatibility of Conventional Metal Implant Alloys**

J. J. Stiglich\*, B. E. Williams, Ultramet, USA

**3:10 PM****Break****3:30 PM****(ICACC-S5-013-2013) Biological properties of ion substituted apatite coatings**

H. Engqvist\*, W. Xia, C. Lindahl, Engineering Sciences, Sweden; A. Ballo, Gothenburg University, Sweden; A. Hoess, S. Pujari, Engineering Sciences, Sweden; J. Lausmaa, P. Thomsen, SP Technical Research Institute of Sweden, Sweden; M. Ott, Engineering Sciences, Sweden

**3:50 PM****(ICACC-S5-018-2013) 3-D printed bioactive bone replacement scaffolds of alkali substituted ortho-phosphates containing meta- and di-phosphates**

F. Dombrowski, C. M. Gomes, G. Berger, BAM Federal Institute for Materials Research and Testing, Germany; P. Garcia Caso, M. Klein, M. Laschke, Saarland University Medical Center, Germany; J. Guenster\*, BAM Federal Institute for Materials Research and Testing, Germany

**4:10 PM****(ICACC-S5-019-2013) Towards a Life-Time Prediction for Yttria-stabilized Zirconia Dental Material experiencing Low-Temperature Degradation**

M. Keuper\*, C. Berthold, K. G. Nickel, Eberhard Karls University Tuebingen- Faculty of Science, Germany

**4:30 PM****(ICACC-S5-021-2013) Solid state NMR study of the structural characteristics of apatite in bone highlighting the role of collagen (Invited)**

T. Azais\*, Université Paris 6, France, Université Paris 6, France, Université Paris 6, France; Y. Wang, Université Paris 6, France; S. Von Euw, G. Laurent, Université Paris 6, France, Université Paris 6, France, Université Paris 6, France; B. Florence, N. Nassif, CNRS, France



## S7: 7th International Symposium on Nanostructured Materials and Nanocomposites

### Patterning and Tomography I

Room: Coquina Salon B

Session Chairs: Prabir Dutta, The Ohio State University; Flavio Soldera, Saarland University; Thomas Fischer, University of Cologne

**1:30 PM**

**(ICACC-S7-058-2013) Soft Lithographic Approaches for Patterning of Metal Oxides and Graphene on Arbitrary Substrates (Invited)**

J. E. ten Elshof\*, University of Twente, Netherlands

**2:00 PM**

**(ICACC-S7-059-2013) Tomography and 3D analysis of micro- and nanostructures (Invited)**

F. Soldera\*, F. Miguel, F. Mücklich, Saarland University, Germany

**2:30 PM**

**(ICACC-S7-069-2013) Shape specific synthesis of ZnO nanoparticles and applications thereof**

K. Elen\*, IMEC vzw, Belgium; M. Murariu, Université de Mons, Belgium; R. Peeters, XIOS Hogeschool Limburg, Belgium; H. Van den Rul, Sirris Smart Coating Application Lab, Belgium; A. Hardy, M. K. Van Bael, Hasselt University - imomec, Belgium

**2:50 PM**

**(ICACC-S7-062-2013) Study of Carbon Nanotubes Effect on Anti-ballistic Property of Abalone-shell-like Silicone-Epoxy Composites**

H. Wang\*, D. Chua, V. Tan, National University of Singapore, Singapore; Z. Sun, Z. Zhang, East China Normal University, China

**3:10 PM**

Break

### Patterning and Tomography II

Room: Coquina Salon B

Session Chairs: Prabir Dutta, The Ohio State University; Flavio Soldera, Saarland University; Thomas Fischer, University of Cologne

**3:30 PM**

**(ICACC-S7-064-2013) Silicon nitride-graphene composites with improved strength and toughness processed from low concentrations of few layer graphene using SPS**

L. S. Walker\*, V. R. Marotto, The University of Arizona, USA; N. Koratkar, Rensselaer Polytechnic Institute, USA; E. L. Corral, The University of Arizona, USA

**3:50 PM**

**(ICACC-S7-065-2013) Reinforcement mechanisms in alumina toughened zirconia nanocomposites with different stabilizing agents**

S. Rivera, L. Goyos, Nanomaterials and Nanotechnology Research Center, Spain; A. Fernández, Instituto Tecnológico de Materiales, Spain; L. A. Diaz\*, Nanomaterials and Nanotechnology Research Center, Spain; J. Moya, Instituto de Ciencia de Materiales de Madrid, Spain; R. Torrecillas, Nanomaterials and Nanotechnology Research Center, Spain

**4:10 PM**

**(ICACC-S7-066-2013) Fabrication and Thermal transport study of carboxylic functionalized multiwalled carbon nanotubes impregnated polydimethylsiloxane nanocomposites**

S. Sagar\*, N. Iqbal, A. Maqsood, School of Chemical and Materials Engineering, Pakistan

**4:30 PM**

**(ICACC-S7-067-2013) Chemically Bonded Phosphate Ceramics Reinforced with Carbon Nanotubes**

J. Wade\*, H. Wu, Loughborough University, United Kingdom

**4:50 PM**

**(ICACC-S7-063-2013) Hexagonal Boron Nitride Nanocomposite Synthesis: A Method Derived from Carbon Technology**

C. Hung\*, J. Hurst, NASA Glenn Research Center, USA

## S11: Next Generation Technologies for Innovative Surface Coatings

### Low Friction Coating for Automobile Applications

Room: Coquina Salon E

Session Chairs: Ali Erdemir, Argonne Nat'l Lab; Taejin Hwang, Korea Institute of Industrial Technology

**1:30 PM**

**(ICACC-S11-001-2013) Frontiers of Surface Engineering for Friction and Wear Control in Engines (Invited)**

A. Erdemir\*, O. Eryilmaz, Argonne Nat'l Lab, USA

**2:00 PM**

**(ICACC-S11-002-2013) Hard nanocomposite coatings: Thermal stability, oxidation protection and resistance to cracking (Invited)**

J. Musil\*, University of West Bohemia, Czech Republic

**2:30 PM**

**(ICACC-S11-003-2013) Structure and properties of nc-Zr(Al)N/Cu thin films synthesized by multi-component single target with the Zr-based bulk metallic glass alloy**

K. Moon\*, J. Sun, C. Lee, S. Shin, KITECH, Republic of Korea

**2:50 PM**

**(ICACC-S11-004-2013) Customized Coating Systems for Products with Added Value from Development to High Volume Production (Invited)**

T. Hosenfeldt\*, Schaeffler Technologies GmbH & Co. KG, Germany

### Advanced Coating for Energy Process

Room: Coquina Salon E

Session Chairs: Hosenfeldt Tim, Schaeffler Group; Do-Suck Han, Hyundai Motor Company

**3:40 PM**

**(ICACC-S11-006-2013) Vapor-phase Synthesis of Metal Oxide Films and Nanowires for Energy Applications (Invited)**

S. Mathur\*, University of Cologne, Germany

**4:10 PM**

**(ICACC-S11-007-2013) Carbon Nanomaterials For High Efficiency Energy Applications (Invited)**

W. Choi\*, University of North Texas, USA

**4:40 PM**

**(ICACC-S11-008-2013) Novel Metallic Interconnect Protective Coatings for Hermetic Sealing and Elimination of Cr Volatility in Planar SOFC Stacks (Invited)**

J. Choi\*, J. W. Stevenson, Y. Chou, Pacific Northwest National Lab, USA

**5:10 PM**

**(ICACC-S11-009-2013) Corrosion and electrical properties of the Zr-based metallic glass bipolar plate for proton exchange membrane fuel cell**

J. Sun\*, C. Lee, K. Moon, S. Shin, KITECH, Republic of Korea

**5:30 PM**

**(ICACC-S11-010-2013) Fabrication of piezoelectric MEMS vibration energy harvester with low resonant frequency**

S. Murakami\*, T. Nagataki, T. Nakade, Technology Research Institute of Osaka Prefecture, Japan; H. Miyabuchi, T. Yoshimura, N. Fujimura, Osaka Prefecture University, Japan

**5:50 PM**

**(ICACC-S11-012-2013) A self-healing scheme of biomimetic surface**

T. Hwang\*, H. Kim, J. Park, KITECH, Republic of Korea

**6:10 PM**

**(ICACC-S11-011-2013) Design and Synthesis of Hybrid Functional Noble Metal based Ternary Nitride Thin Films**

W. Kwack, S. Kwon\*, Pusan National University, Republic of Korea

## S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

### Novel Methods for Joining and Machining of Components

Room: Coquina Salon F

Session Chair: Zenghua Gao, Institute of Metal Research, Chinese Academy of Sciences

**1:30 PM**

**(ICACC-S12-040-2013) Advances in Spark Plasma Joining of Ultra-High Temperature Ceramics: An Investigation into Direct Current Assisted Joining Mechanisms & Properties (Invited)**

W. Pinc, L. S. Walker, E. L. Corral\*, University of Arizona, USA

**2:00 PM**

**(ICACC-S12-041-2013) Welding of Ultra High Temperature ZrB<sub>2</sub> Ceramics**

D. King\*, G. Hilmas, W. Fahrenholtz, Missouri University of Science and Technology, USA

**2:20 PM**

**(ICACC-S12-042-2013) High Temperature Joining Solution For Thermal Protection Systems Based On Intermetallic Alloys**

J. Barceña\*, C. Jimenez, M. Lagos, Tecnalia Research & Innovation, Spain; K. Mergia, N.C.S.R. "Demokritos, Greece; I. Agote, Tecnalia Research & Innovation, Spain; C. Badini, Politecnico di Torino, Italy; C. Wilhelm, EADS Innovation Works, Germany

**2:40 PM**

**(ICACC-S12-043-2013) Joining of ZrB<sub>2</sub>-based ultra-high-temperature ceramic composites using Pd-based braze alloys**

A. Goodarzi\*, H. Taylor, Harvard University, USA

**3:00 PM**

**Break**

### Novel Processing Methods

Room: Coquina Salon F

Session Chair: Erica Corral, University of Arizona

**3:20 PM**

**(ICACC-S12-044-2013) Zirconium carbide ceramics for potential applications in extreme environments of ultra high temperature or strong radiation**

G. Zhang\*, Shanghai Institute of Ceramics, China

**3:40 PM**

**(ICACC-S12-045-2013) Si-SiC-ZrB<sub>2</sub> ceramics produced by reactive silicon infiltration**

A. Ortona\*, SUPSI, Switzerland; S. Biamino, Politecnico di Torino, Italy; C. D'Angelo, SUPSI, Switzerland; G. D'Amico, P. Fino, Politecnico di Torino, Italy

**4:00 PM**

**(ICACC-S12-046-2013) Ultra-Low Temperature Sintering of Ultra-High Temperature Ceramics**

H. Kimura\*, Natl Defense Academy, Japan

**4:20 PM**

**(ICACC-S12-047-2013) Synthesis and Sintering of TaC-HfC ceramics by SHS and RSPS techniques**

O. Cedillos\*, D. D. Jayaseelan, W. E. Lee, Imperial College London, United Kingdom; A. Chrysanthou, University of Hertfordshire, United Kingdom

**4:40 PM**

**(ICACC-S12-048-2013) Synthesis of HfB<sub>2</sub> Powders for Aerospace Applications**

P. Zheng\*, S. Venugopal, A. Paul, B. Vaidhyanathan, J. Binner, Loughborough University, United Kingdom

**5:00 PM**

**(ICACC-S12-049-2013) Erosion-resistant Cr<sub>2</sub>AlC and Ti<sub>2</sub>AlC coatings (Invited)**

C. Leyens\*, Technische Universität Dresden, Germany

**5:20 PM**

**(ICACC-S12-050-2013) Synthesis of epitaxial MAX phase thin films by thermal annealing**

T. Cabioch\*, A. Drevin-Bazin, M. Beaufort, M. Alkazaz, University of Poitiers, France; P. Eklund, IFM Linköping University, Sweden; J. Barbot, University of Poitiers, France

**5:40 PM**

**(ICACC-S12-051-2013) Study the parameters of Ti<sub>2</sub>AlC and Ti<sub>3</sub>AlC<sub>2</sub> MAX phases fabrication by Mechanically Activated Self-propagating High temperature Synthesis**

A. Sedghi\*, Imam Khomeini International University, Islamic Republic of Iran; R. Vahed, Imam Khomeini International University, Islamic Republic of Iran; A. Razaghian Arani, Imam Khomeini International University, Islamic Republic of Iran

## S13: Advanced Ceramics and Composites for Sustainable Nuclear Energy and Fusion Energy

### Joining / Irradiation and Environmental Effects I / Fabrication and Processing of Ceramic Functional Materials

Room: Ponce DeLeon

Session Chairs: Yutai Katoh, Oak Ridge National Laboratory; Josef Matyas, Pacific Northwest National Lab

**1:30 PM**

**(ICACC-S13-020-2013) Glass-ceramics as joining materials for nuclear applications (Invited)**

M. Ferraris\*, V. Casalegno, S. Rizzo, M. Salvo, Politecnico di Torino, Italy; D. Blagoeva, NRG, Netherlands

**2:00 PM**

**(ICACC-S13-021-2013) A Novel Composite Brazing Approach for Joining Silicon Carbide**

E. D. Herderick\*, EWI, USA

**2:20 PM**

**(ICACC-S13-022-2013) Evaluation of Engineered Microstructures for Enhanced Reliability in Nuclear Grade Joints**

H. Khalifa\*, C. P. Deck, C. Hill, C. A. Back, General Atomics, USA

**2:40 PM**

**(ICACC-S13-023-2013) Radiation Stability of Silicon Carbide Joints Made by Various Bonding Methods**

Y. Katoh\*, Oak Ridge National Laboratory, USA; T. Hinoki, Kyoto University, Japan; M. Ferraris, Politecnico di Torino, Italy; C. H. Henager, Pacific Northwest National Laboratory, USA

**3:00 PM**

**Break**

**3:20 PM**

**(ICACC-S13-024-2013) Effect of irradiation and chemical interaction on select MAX phases for Gen IV reactors (Invited)**

D. J. Tallman\*, G. W. Bentzel, Drexel University, USA; E. Hoffman, R. Sindelar, G. Kohse, Savannah River National Lab, USA; M. W. Barsoum, Drexel University, USA

**3:50 PM**

**(ICACC-S13-027-2013) Oxidation behavior of UO<sub>2</sub> in air**

K. Suzuki\*, Japan Atomic Energy Agency, Japan; A. T. Nelson, Los Alamos National Laboratory, USA; T. Sunaoshi, Inspection Development Company, Japan; K. J. McClellan, Los Alamos National Laboratory, USA; M. Kato, Japan Atomic Energy Agency, Japan

**4:10 PM**

**(ICACC-S13-029-2013) Silver-functionalized silica aerogel: A novel benchmark for capturing and immobilization of iodine-129 from fuel reprocessing off-gas**

J. Matyas\*, G. Fryxell, Pacific Northwest National Lab, USA

**4:30 PM****(ICACC-S13-030-2013) Mechanical Properties of Porous Silicon Carbide Composites Following Exposure at Elevated Temperature in Air**

T. Hinoki\*, K. Shimoda, Kyoto University, Japan; S. Maeta, N. Konishi, GUNZE LIMITED, Japan; K. Toyoshima, Kyoto University, Japan; T. Kawahara, A. Sato, GUNZE LIMITED, Japan

**4:50 PM****(ICACC-S13-031-2013) Modifications of Micro-structure and Pore Morphology of Lithium Orthosilicate Pebbles during Sintering**

D. Mandal\*, D. Sen, S. Mazumder, S. Ramnathan, Bhabha Atomic Research Centre, India

**FS1: Geopolymers and Chemically Bonded Ceramics****Porosity II**

Room: Coquina Salon A

Session Chair: Sylvie Rossignol, CEC GEMH ENSCI

**1:30 PM****(ICACC-FS1-009-2013) The influence of curing conditions on mechanical strength and porosity of geopolymers (Invited)**

H. Engqvist\*, B. Cai, T. Mellgren, Engineering Sciences, Sweden; S. Bredenberg, Orexo AB, Sweden

**2:00 PM****(ICACC-FS1-010-2013) Effects of pore evolution on the mechanical properties and microstructure of Inorganic Polymer Cement-Aggregate systems**

E. Kamseu\*, University of Modena, Italy; C. Leonelli, University of Modena and Reggio Emilia, Italy; V. M. Sglavo, University of Trento, Italy

**2:20 PM****(ICACC-FS1-011-2013) Use of industrial sludges to produce geopolymer foam**

E. Prud'homme\*, P. Michaud, GEMH-ENSCI, France; E. Joussein, GRESE, France; S. Rossignol, GEMH-ENSCI, France

**2:40 PM****(ICACC-FS1-012-2013) Optimization of Gas Adsorption Porosimetry for Geopolymer Analysis**

B. E. Glad\*, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**3:00 PM****Break****Mechanical Properties**

Room: Coquina Salon A

Session Chair: Miladin Radovic, Texas A&M University

**3:20 PM****(ICACC-FS1-013-2013) Chemically Bonded Phosphate Ceramics Subject to Temperatures up to 1000 C**

H. A. Colorado\*, J. Yang, UCLA, USA; C. Hiel, Composite Support and Solutions Inc., USA

**3:40 PM****(ICACC-FS1-014-2013) Mechanical Properties and Microstructure of Potassium-based Geopolymer with Chamotte Particulate Reinforcement**

S. Musil\*, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**4:00 PM****(ICACC-FS1-015-2013) Optimized cesium substitution in potassium-based geopolymers for enhanced mechanical properties**

A. J. Steveson\*, W. M. Kriven, University of Illinois at Urbana-Champaign, USA

**4:20 PM****(ICACC-FS1-017-2013) Static and Dynamic Properties of Potassium-Based Geopolymer as Measured by Different Techniques**

S. Cho\*, University of Illinois at Urbana-Champaign, USA

**4:40 PM****(ICACC-FS1-018-2013) Influence of the interaction between different metakaolins and reinforcements on the mechanical properties of geopolymers**

A. Autef\*, E. Joussein, CEC-GEMH, France; G. Gasgnier, Imerys Ceramic Center, France; S. Rossignol, CEC-GEMH, France

**5:00 PM****(ICACC-FS1-019-2013) Evaluation of Geopolymer Concretes at Elevated Temperatures**

K. Kupwade-Patil\*, S. Badar, E. N. Allouche, Louisiana Tech University, USA

**FS4: Advanced Ceramic Materials and Processing for Photonics and Energy****Advanced and Nanostructured Materials for Photovoltaics, including Solar Hydrogen**

Room: Oceanview

Session Chairs: Gunnar Westin, Uppsala University; Alberto Gasparotto, Padova University and INSTM

**1:30 PM****(ICACC-FS4-010-2013) Inorganic and organic solar cell degradation mechanisms (Invited)**

G. Fanchini\*, University of Western Ontario, Canada

**1:50 PM****(ICACC-FS4-011-2013) Photoinduced properties of Multiferroics (Invited)**

R. Nechache\*, University of Rome Tor Vergata, Italy

**2:10 PM****(ICACC-FS4-013-2013) Strain Induced Solar Power Conversion Efficiency Enhancement in Periodic Stacking of Multiferroic Bilayers**

J. Chakrabarty\*, R. Nechache, F. Rosei, INRS, Quebec, Canada, Canada

**2:30 PM****(ICACC-FS4-014-2013) Engineering Metal Oxide Structures for Efficient Photovoltaic Devices (Invited)**

I. Concina\*, G. S. Selopal, CNR-IDASC SENSOR Laboratory & Brescia University, Italy; N. Memarian, Semnan University, Islamic Republic of Iran; V. Galstyan, G. Sberveglieri, A. Vomiero, CNR-IDASC SENSOR Laboratory & Brescia University, Italy

**2:50 PM****Break****3:10 PM****(ICACC-FS4-015-2013) Photoelectrochemical water splitting using an all-solid-state cell with gaseous reactants**

K. O. Iwu, T. Norby\*, A. Galeckas, A. Kuznetsov, University of Oslo, Norway

**3:30 PM****(ICACC-FS4-008-2013) Investigation of the Effect of Porosities on the Efficiency of DSSCS Produced by Using Nano-sized TiO2**

N. Bilgin\*, METU, Turkey; J. Park, Atilim University, Turkey; A. Ozturk, METU, Turkey

**3:50 PM****(ICACC-FS4-012-2013) One dimensional multiferroic materials for solar energy conversion**

S. Li\*, R. Nechache, F. Rosei, EMT-INRS, Canada

**Advanced and Nanostructured Materials for Sensing and Electronics**

Room: Oceanview

Session Chair: Mauro Epifani, CNR-IMM

**4:30 PM**

**(ICACC-FS4-018-2013) Tailoring nanoscale sensing devices through chemical functionalization of graphene and ZnO nanowires (Invited)**

K. Balasubramanian\*, T. Kurkina, V. Pachauri, S. Sundaram, R. S. Sundaram, Max Planck Institute for Solid State Research, Germany; F. Re, M. Masserini, Università degli Studi di Milano Bicocca, Italy; K. Kern, Max Planck Institute for Solid State Research, Germany; K. Kern, Ecole Polytechnique Federale de Lausanne, Switzerland

**4:50 PM**

**(ICACC-FS4-019-2013) Advanced polymer-ceramic nanocomposites for tunable RF and microwave device applications (Invited)**

H. Srikanth\*, University of South Florida, USA

**5:10 PM**

**(ICACC-FS4-020-2013) All-alkoxide based solution deposition and properties of spinel and perovskite films, and multi-layer structures (Invited)**

G. Westin\*, A. Kumar, K. Lashagari, A. Pohl, K. Olof, Uppsala University, Sweden; K. Jansson, Stockholm University, Sweden

**Engineering Ceramics Summit of the Americas**

**Ceramics for Energy and Environmental Systems**

Room: Coquina Salon G

Session Chairs: Kevin Plucknett, Dalhousie University; R. Muccillo, IPEN

**1:30 PM**

**(ICACC-ECSA-015-2013) Reflections on the present and future of the ceramic refractory area (Invited)**

V. C. Pandolfelli\*, UFSCar, Brazil

**2:00 PM**

**(ICACC-ECSA-016-2013) Ceramic Hot-Surface Ignition Systems for Natural Gas Clean Engines: A Case Study of Successful Industry-University R&D in Canada (Invited)**

T. Troczynski\*, UBC, Canada

**2:30 PM**

**(ICACC-ECSA-017-2013) Advanced Ceramics for Mineral Processing and Energy Generation and the Technology Importance for Ceramic Manufacturing (Invited)**

E. Medvedovski\*, Consultant, Canada

**3:00 PM**

Break

**3:20 PM**

**(ICACC-ECSA-018-2013) Recent developments on electric-field assisted sintering ceramic materials (Invited)**

R. Muccillo\*, E. N. Muccillo, IPEN, Brazil

**3:50 PM**

**(ICACC-ECSA-019-2013) Recent Developments in Cermets and Hard Boride Coatings (Invited)**

K. P. Plucknett\*, Dalhousie University, Canada

**4:20 PM**

**(ICACC-ECSA-020-2013) Using material science to prepare novel tailored ceramic materials to improve the performance of hydrocarbon processing units (Invited)**

T. Szymanski\*, Saint-Gobain NorPro, USA

**4:50 PM**

**(ICACC-ECSA-021-2013) Properties and Growth Mechanism of Transparent and Conductive Indium Tin Oxide Nanowires (Invited)**

E. P. Arlindo, J. A. Lucindo, M. O. Orlandi\*, UNESP- Araraquara, Brazil

**5:20 PM**

**(ICACC-ECSA-022-2013) Magnetoelectric coefficient in oxide electrodes buffered lanthanum modified bismuth ferrite thin films grown by chemical method (Invited)**

A. Z. Simões\*, J. A. Varela, E. Longo, UNESP, Brazil

**Friday, February 1, 2013**

**S3: 10th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology**

**Mechanical/Thermal Properties**

Room: Coquina Salon H

Session Chairs: Teruhisa Horita, AIST; S. Elangovan, Ceramtec, Inc.

**8:00 AM**

**(ICACC-S3-056-2013) The mechanical behavior of solid oxide fuel cell substrates in relevant environments**

A. Shyam\*, D. McClurg, A. Pandey, T. Rosa, E. Lara-Curzio, Oak Ridge National Laboratory, USA; R. Goettler, LG Fuel Cell Systems Inc., USA

**8:20 AM**

**(ICACC-S3-057-2013) Thermal Residual Stress and Biaxial Strength of (Y2O3)0.08(ZrO2)0.92 / (Sc2O3)0.1(CeO2)0.01(ZrO2)0.89 Multi-layered Electrolytes for Intermediate Temperature Solid Oxide Fuel Cells**

Y. Chen\*, N. Orlovskaya, University of Central Florida, USA; T. Graule, J. Kuebler, Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for High Performance Ceramics, Switzerland

**8:40 AM**

**(ICACC-S3-058-2013) Evaluation of crack mechanism of SOFCs in redox cycle at high temperatures using X-CT method**

T. Kushi\*, K. Fujita, Tokyo Gas Co., Ltd., Japan

**9:00 AM**

**(ICACC-S3-059-2013) Thermal diffusivity/conductivity of Zirconia before, during and after Sintering**

E. Post\*, NETZSCH Geraetebau GmbH, Germany

**Electrolysis etc**

Room: Coquina Salon H

Session Chairs: S. Elangovan, Ceramtec, Inc.; Teruhisa Horita, AIST

**9:20 AM**

**(ICACC-S3-060-2013) Operating strategies to counteract degradation in SOEC systems**

J. B. Hansen\*, Haldor Topsoe A/S, Denmark; J. U. Nielsen, M. F. Madsen, Topsoe Fuel Cell A/S, Denmark

**9:40 AM**

Break

**10:00 AM**

**(ICACC-S3-061-2013) Testing and Analysis of Solid Oxide Electrolysis Stacks**

S. Elangovan\*, J. Hartvigsen, Ceramtec, Inc., USA; P. Singh, University of Connecticut, USA

**10:20 AM**

**(ICACC-S3-062-2013) Thermal imaging of Solid Oxide Cells during co-electrolysis of carbon dioxide and steam**

D. J. Cumming\*, R. H. Elder, D. C. Sinclair, University of Sheffield, United Kingdom

10:40 AM

**(ICACC-S3-063-2013) Propane driven hot gas ejector for anode off gas recycling in an SOFC-system**

C. Immisch\*, A. Lindermeir, R. Dietrich, CUTEK Institut, Germany

11:00 AM

**(ICACC-S3-064-2013) Progress in Development of Solid Oxide Fuel Cells with Silver Based Composites**

A. Sarikaya\*, V. Petrovsky, F. Dogan, Missouri University of Science and Technology, USA

11:20 AM

**(ICACC-S3-065-2013) Aqueous processing routes for new SOFC materials**

M. C. Verbraeken\*, M. Cassidy, J. T. Irvine, University of St Andrews, United Kingdom

11:40 AM

**(ICACC-S3-066-2013) Proton conducting lanthanum tungstates for ceramic fuel cells and gas separation membranes**

T. Norby\*, University of Oslo, Norway

## S5: Next Generation Bioceramics and Biocomposites

### Ceramics for Medical and Dental Applications

Room: Coquina Salon C

Session Chair: A. Cuneay Tas, University of Illinois at Urbana-Champaign

8:00 AM

**(ICACC-S5-022-2013) Processing and Microstructure-Property of Multi Stage Spark Plasma Sintered Hydroxyapatite- Calcium Titanate Biocomposite**

P. K. Mallik\*, K. Balani, B. Basu, Indian Institute of Technology, India

8:20 AM

**(ICACC-S5-024-2013) Calcium metal to synthesize amorphous or cryptocrystalline calcium phosphates**

A. Tas\*, Yeditepe University, Turkey

8:40 AM

**(ICACC-S5-025-2013) Energetics of Rare Earth Doped Apatite-Based Materials**

S. Hosseini\*, A. Navrotsky, UC Davis, USA; C. Drouet, Institut Carnot CIRIMAT, France

9:00 AM

**(ICACC-S5-026-2013) Investigation of Effect of Polymers on Calcium Oxalate Crystallization**

M. Oner\*, B. Akin, Yildiz Technical University, Turkey

9:20 AM

**(ICACC-S5-028-2013) Production of Potassium Titanate Whisker Reinforced Dental Composites**

D. Kapusuz\*, Middle East Technical University, Turkey; J. Park, Atilim University, Turkey; A. Ozturk, Middle East Technical University, Turkey

9:40 AM

Break

10:00 AM

**(ICACC-S5-030-2013) Perfluorodecalin containing bioceramics and bone regeneration (Invited)**

F. Tamimi\*, P. Comeau, McGill University, Canada; D. Le Nihouannen, University of Bordeaux, France; Y. Zhang, D. Bassett, S. Khalili, McGill University, Canada; U. Gbureck, University of Wuzburg, Germany; S. D. Tran, K. Svetlana, J. E. Barralet, McGill University, Canada

10:20 AM

**(ICACC-S5-023-2013) Enhancement of hydroxyapatite precipitation on PDLLA scaffolds functionalized with diazonium chemistry**

H. Mahjoubi\*, M. Cerruti, McGill University, Canada

10:40 AM

**(ICACC-S5-027-2013) Surface modification of sol-gel-derived 45S5 Bioglass® for incorporation in polylactic acid (PLA)**

E. Rezaeibeigi\*, P. Wood-Adams, R. Drew, Concordia University, Canada

## S11: Next Generation Technologies for Innovative Surface Coatings

### NEXT Generation Coating

Room: Coquina Salon E

Session Chairs: Jun Akedo, National Institute of Advanced Industrial Science and Technology (AIST); Sang Sub Kim, Inha University

8:00 AM

**(ICACC-S11-013-2013) Grain orientation control of bismuth layer-structured ferroelectrics and bismuth based perovskite oxides thick films prepared by aerosol deposition method (Invited)**

M. Suzuki\*, J. Akedo, National Institute of Advanced Industrial Science and Technology (AIST), Japan

8:30 AM

**(ICACC-S11-014-2013) Atomic layer deposition of buffer and transparent conducting oxide layer for CIGS solar cell (Invited)**

J. Kim\*, H. Kim, J. Kim, H. Yu, SK innovation, Republic of Korea

9:00 AM

**(ICACC-S11-016-2013) Highly Sensitive Chemiresistive Sensors Using Oxide Fibers Based on Interface Engineering**

S. Kim\*, Inha University, Republic of Korea

9:20 AM

**(ICACC-S11-017-2013) Development of Porous TBC Systems with Enhanced Durability using TriplexPro 210 Technology**

M. R. Dorfman\*, C. Dambra, J. Medrano, D. Chen, M. Nestler, Sulzer Metco (US) Inc, USA

9:40 AM

**(ICACC-S11-018-2013) Enhancement of energy conversion efficiency of porous TiO<sub>2</sub> thin films for DSSC application**

H. Kim\*, T. Hwang, KITECH, Republic of Korea

10:00 AM

**(ICACC-S11-015-2013) Linearly aligned diamond fillers in polysiloxane/diamond composite films with enhanced thermal conductivity**

T. Nakayama\*, Nagaoka Univ of Tech, Japan

### Innovative Surface Coating

Room: Coquina Salon E

Session Chairs: Masahiro Yoshimura, National Cheng Kung University; Do-Geun Kim, Korea Institute of Materials Science

10:20 AM

**(ICACC-S11-019-2013) Growing Integration Layer [GIL] Strategy: Direct Fabrication of Hierarchically Structured Ceramic Coatings on Metallic Materials in Solution (Invited)**

M. Yoshimura\*, National Cheng Kung University, Taiwan

10:50 AM

**(ICACC-S11-020-2013) Influence of oxygen content on the hardness and electrical resistivity of Cr(N,O) thin films**

A. Sato\*, T. Endo, K. Suzuki, T. Suzuki, T. Nakayama, H. Suematsu, K. Niihara, Nagaoka University of Technology, Japan

11:10 AM

**(ICACC-S11-021-2013) XPS analysis for tribological behavior of CrMoN film prepared by hybrid PVD**

Y. Oh\*, Y. Yang, KICET, Republic of Korea; I. Lyo, Hyundai & Kia, Republic of Korea; S. Park, Hyundai Hysco, Republic of Korea; D. Lim, Korea University, Republic of Korea

11:30 AM

**(ICACC-S11-022-2013) Preparation of Cr-Si-N single crystal thin film with epitaxial growth by pulsed laser deposition**

T. Endo\*, K. Suzuki, A. Sato, T. Suzuki, T. Nakayama, H. Suematsu, K. Niihara, Nagaoka University of Technology, Japan

11:50 AM

**(ICACC-S11-023-2013) Fabrication and characterization of porous TiO<sub>2</sub> films for photocatalytic removal of VOC**

J. Park\*, T. Hwang, KITECH, Republic of Korea

## S12: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

### Methods for Improving Damage Tolerance, Oxidation and Thermal Shock Resistance I

Room: Coquina Salon F

Session Chair: Luke Walker, The University of Arizona

8:00 AM

(ICACC-S12-052-2013) Behaviors of Ceramic Matrix Composites (CMCs) and ultrahigh temperature ceramic (UHTC) Coatings at High Temperature Environments (Invited)

S. Dong\*, X. Zhang, Y. Ding, L. Gao, H. Zhou, Z. Wang, P. He, Y. Kan, Shanghai Institute of Ceramics, CAS, China

8:30 AM

(ICACC-S12-053-2013) Development of Novel Processing Methods for Next Generation Ultra-High Temperature ZrB<sub>2</sub>-SiC Fiber Reinforced Composites

B. J. Lai\*, J. L. Watts, G. E. Hilmas, W. G. Fahrenholtz, Missouri University of Science and Technology, USA

8:50 AM

(ICACC-S12-054-2013) Fabrication and Characterization of Continuous SiC Fiber Reinforced HfB<sub>2</sub>-SiC Composites

C. J. Leslie\*, E. Boakye, K. Keller, M. Ciniulk, AFRL, USA

9:10 AM

(ICACC-S12-055-2013) Development and Evaluation of SiC Fiber Reinforced ZrB<sub>2</sub> Based Composites for use in Extreme Environments

J. Watts\*, G. Hilmas, W. Fahrenholtz, Missouri S & T, USA

9:30 AM

Break

### Methods for Improving Damage Tolerance, Oxidation and Thermal Shock Resistance II

Room: Coquina Salon F

Session Chair: Laura Silvestroni, CNR-ISTEC

9:50 AM

(ICACC-S12-056-2013) Study of SiC fiber-matrix interaction in ultra-high temperature ceramics by transmission electron microscopy

L. Silvestroni\*, S. Diletta, CNR, Italy

10:10 AM

(ICACC-S12-057-2013) High temperature oxidation resistant ceramic matrix composites by reverse infiltrated ultra high temperature ceramic-coated carbon-carbon composites

L. S. Walker\*, E. L. Corral, The University of Arizona, USA

10:30 AM

(ICACC-S12-058-2013) Sub-micron HfB<sub>2</sub> Powder Protected Cf - Preform

S. Venugopal\*, A. Paul, Loughborough university, United Kingdom; P. Zheng, B. Vaithyanathan, J. Binner, Loughborough University, United Kingdom; A. Heaton, P. Brown, DSTL, United Kingdom

10:50 AM

(ICACC-S12-059-2013) The Effect of WO<sub>3</sub> on Sinterability and Properties of ZrO<sub>2</sub> Ceramics

M. Kazemzadeh Dehdashti\*, W. G. Fahrenholtz, G. E. Hilmas, Missouri University of Science and Technology, USA

11:10 AM

(ICACC-S12-060-2013) Influence of precursor ZrC powders on the properties of the spark plasma sintered ceramic composite materials

N. Voltsihin\*, I. Hussainova, D. Yung, Tallinn University of Technology, Estonia; E. Cura, S. Hannula, Aalto University, Finland

11:30 AM

(ICACC-S12-061-2013) Thermomechanical Properties of Shape Memory Alloy (NiTi) and MAX (Ti<sub>3</sub>SiC<sub>2</sub>) Phase Interpenetrating Composites

A. Kothalkar, R. Benitez, L. Hu\*, M. Radovic, I. Karaman, Texas A&M University, USA

## S13: Advanced Ceramics and Composites for Sustainable Nuclear Energy and Fusion Energy

### Irradiation and Environmental Effects II & III

Room: Ponce DeLeon

Session Chairs: Tatsuya Hinoki, Kyoto University; Weon-Ju Kim, Korea Atomic Energy Research Institute

8:00 AM

(ICACC-S13-032-2013) Environmental Effect on the Oxidation of CVD SiC Ceramics and Composites (Invited)

W. Kim\*, D. Kim, J. Park, Korea Atomic Energy Research Institute, Republic of Korea

8:30 AM

(ICACC-S13-033-2013) Biaxial mechanical behavior of SiC<sub>f</sub>/SiC composite tubes

F. Bernachy-Barbe\*, L. Gelebart, CEA, France; J. Crepin, Mines ParisTech, France; M. Bornert, Ecole des Ponts ParisTech, France

8:50 AM

(ICACC-S13-034-2013) Dimensional changes and flexural behavior of neutron irradiated 2D carbon fiber reinforced SiC matrix composite

C. Shih\*, Y. Katoh, Oak Ridge National Laboratory, USA; J. Steinbeck, Physical Sciences Inc., USA

9:10 AM

(ICACC-S13-035-2013) Tensile and Interfacial Properties of Unidirectional Advanced SiC/SiC Minicomposites

K. Ozawa\*, T. Nozawa, H. Tanigawa, Japan Atomic Energy Agency, Japan; Y. Katoh, L. L. Snead, Oak Ridge National Laboratory, USA

9:30 AM

(ICACC-S13-036-2013) The Use of Additives to Improve SiC-SiC Composites for Nuclear Applications

C. P. Deck\*, H. E. Khalifa, C. Hill, C. A. Back, General Atomics, USA

9:50 AM

Break

10:10 AM

(ICACC-S13-037-2013) Microstructural behavior of SiC/SiC composites under ion irradiation environment (Invited)

N. Chaabane\*, M. Le Flem, T. Vandenberghe, S. Urvoy, CEA Saclay, France; P. Dumas, Synchrotron SOLEIL, France; Y. Serruys, CEA Saclay, France

10:40 AM

(ICACC-S13-038-2013) Radiation effects in thick Gd<sub>2</sub>O<sub>3</sub> films used for neutron detection

D. Grave\*, Z. Hughes, J. Robinson, D. Wolfe, Penn State University, USA

11:00 AM

(ICACC-S13-039-2013) Magnesium phosphate cements for nuclear waste encapsulation

W. Montague\*, Imperial College London, United Kingdom; M. Hayes, National Nuclear Laboratory, United Kingdom; L. J. Vandeperre, Imperial College London, United Kingdom

**11:20 AM****(ICACC-S13-040-2013) Dimensional stability of graphite under ion-irradiation**

M. Nonaka\*, S. Kondo, T. Hinoki, Kyoto University, Japan

**11:40 AM****(ICACC-S13-041-2013) Temperature dependence of the contraction rates of the nuclear-grade graphite**

S. Kondo\*, T. Hinoki, Kyoto University, Japan; M. Okuda, T. Takagi, IBIDEN CO., LTD., Japan

**FS1: Geopolymers and Chemically Bonded Ceramics****Novel Applications**

Room: Coquina Salon A

Session Chair: Claus Rüschler, Leibniz University Hannover

**8:00 AM****(ICACC-FS1-020-2013) Basic research on geopolymer gels for production of green binders and hydrogen storages (Invited)**

C. H. Rüschler\*, L. Schomborg, A. Schulz, J. C. Buhl, Leibniz University Hannover, Germany

**8:30 AM****(ICACC-FS1-021-2013) Low density geopolymers containing silver nanoparticles with biocide activity (Invited)**

B. Cabal\*, Nanomaterials and Nanotechnology Research Center (CINN-CSIC-UO-PA), Spain; B. E. Glad, W. M. Kriven, University of Illinois at Urbana-Champaign, USA; F. Rojo, National Center for Biotechnology (CNB-CSIC), Spain; R. Torrecillas, Nanomaterials and Nanotechnology Research Center (CINN-CSIC-UO-PA), Spain; J. S. Moya, Materials Science Institute of Madrid (ICMM-CSIC), Spain

**9:00 AM****(ICACC-FS1-022-2013) Mechanical Characteristics of Natural Fiber-Reinforced Geopolymer Composites**

J. Low\*, T. Alomayri, Curtin University, Australia

**9:20 AM****(ICACC-FS1-023-2013) Green Composite: Processing, Mechanical Properties and Microstructure of Sodium-based Geopolymer Reinforced with Chemically Extracted Corn Husk Fibers (Invited)**

S. Musil\*, University of Illinois at Urbana-Champaign, USA; P. Keane, W. M. Kriven, Keanetech LLC, USA

**9:40 AM****Break****10:00 AM****(ICACC-FS1-024-2013) Ceramic Wall Tile Development by Geopolymerization (Invited)**

F. Kara\*, G. Korc, M. Vicent, K. G. Suzuk, T. Seiffarth, Anadolu University, Turkey

**Construction Materials**

Room: Coquina Salon A

Session Chair: Kwesi Sagoe-Crentsil, CSIRO

**10:30 AM****(ICACC-FS1-025-2013) Use of local geomaterials for water harvesting in Jordan (Invited)**

H. Rahier\*, M. Esaifan, J. Wastiels, Vrije Universiteit Brussel, Belgium; H. Khoury, University of Jordan, Jordan

**11:00 AM****(ICACC-FS1-026-2013) Serviceability, durability and chemical factors governing Geopolymer concrete performance (Invited)**

K. Sagoe-Crentsil\*, S. Yan, T. Brown, CSIRO, Australia

**11:30 AM****(ICACC-FS1-027-2013) Optimization and Characterization of Geopolymer Concrete using Response Surface Methodology (Invited)**

M. Dhakal, K. Kupwade-Patil\*, Louisiana Tech University, USA; A. Agarwal, Indian Institute of Technology (IIT), India; E. N. Allouche, Louisiana Tech University, USA

**FS4: Advanced Ceramic Materials and Processing for Photonics and Energy****Multifunctional Materials**

Room: Oceanview

Session Chairs: Francois Legare, INRS; Mohamed Chaker, INRS

**8:00 AM****(ICACC-FS4-021-2013) Priorities for Ceramics Education and Research (Invited)**

L. D. Madsen\*, National Science Foundation, USA

**8:30 AM****(ICACC-FS4-022-2013) Core-shell Carbon Nanotubes Structures and its applications (Invited)**

D. Chua\*, National University of Singapore, Singapore

**8:50 AM****(ICACC-FS4-023-2013) Multifunctional inorganic nanomaterials: from design to energy and environmental applications (Invited)**

A. Gasparotto\*, Padova University and INSTM, Italy; D. Barreca, CNR-ISTM and INSTM, Italy; D. Bekermann, G. Carraro, C. Maccato, Q. Simon, Padova University and INSTM, Italy

**9:10 AM****(ICACC-FS4-024-2013) Si-nanowire devices by controlling Si nanowire growth (Invited)**

N. Quitarano\*, McGill University, Canada

**9:30 AM****Break****9:50 AM****(ICACC-FS4-025-2013) Modification of the Electrical Conduction Properties of the Grain Boundaries of Nanocrystalline Mixed Conducting Ceramics (Invited)**

G. Gregori\*, M. C. Göbel, P. Lupetin, J. Maier, Max Planck Institute for Solid State Research, Germany

**10:10 AM****(ICACC-FS4-026-2013) Multifunctional titania materials: from surface modification to nanocrystal inclusion, and related applications (Invited)**

M. Epifani\*, CNR-IMM, Italy

**10:30 AM****(ICACC-FS4-030-2012) Synthetic strategies for creating CdSe/polymer hybrid materials for photovoltaic applications (Invited)**

K. Mazzio, K. Okamoto, C. Luscombe\*, University of Washington, USA

**11:00 AM****(ICACC-FS4-029-2013) Room temperature ferromagnetism in Cobalt and Europium implanted Zinc Oxide thin films**

J. Lee\*, G. Xing, The University of New South Wales, Australia; T. Chen, The Chinese University of Hong Kong, China; P. Photongkam, Synchrotron Light Research Institute, Thailand; M. Ionescu, Australian Nuclear Science and Technology Organisation, Australia; Y. Zhang, S. Li, The University of New South Wales, Australia

**11:20 AM****(ICACC-FS4-027-2013) Effect of annealing on the dielectric properties of amorphous silicon carbonitrides ceramic**

H. Gong\*, L. An, University of Central Florida, USA

## Engineering Ceramics Summit of the Americas

### Ceramics for Energy and Aerospace Systems

Room: Coquina Salon G

Session Chairs: Hua-Tay Lin, Oak Ridge National Laboratory; Michael Halbig, NASA Glenn Research Center

#### 8:00 AM

##### (ICACC-ECSA-023-2013) Automated Creep Rupture Water Vapor Degradation Model for Gas Turbine Hot Section Ceramics (Invited)

M. K. Ferber\*, H. Lin, ORNL, USA; M. van Roode, MvR Institute of Technology, USA

#### 8:30 AM

##### (ICACC-ECSA-024-2013) A Miniature Ceramic Gas Turbine Engine Architecture Designed for Long Life and High Reliability (Invited)

M. Vick\*, U.S. Naval Research Lab, USA

#### 9:00 AM

##### (ICACC-ECSA-025-2013) Ceramic Microturbines for Small-Scale Distributed Energy Applications (Invited)

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

#### 9:20 AM

##### (ICACC-ECSA-026-2013) Thermal Protection Materials and Systems: Successes and Challenges (Invited)

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

#### 9:50 AM

Break

#### 10:10 AM

##### (ICACC-ECSA-027-2013) Ceramic Matrix Composite Component Development and Demonstration For Applications in Aircraft Turbine Engines (Invited)

M. C. Halbig\*, M. H. Jaskowiak, J. D. Kiser, D. Zhu, NASA Glenn Research Center, USA

#### 10:30 AM

##### (ICACC-ECSA-028-2013) SiC/SiC Ceramic Matrix Composite: Challenges and Opportunities in the Turbine Engine Industry (Invited)

A. Chamberlain\*, J. Lane, Rolls-Royce Corporation, USA

#### 11:00 AM

##### (ICACC-ECSA-029-2013) Advanced Non-Oxide Ceramics in Energy Generation and Conservation (Invited)

B. Mikijelj\*, Ceradyne Inc., USA

#### 11:30 AM

##### (ICACC-ECSA-030-2013) Ceramic, gas-separation membranes for advanced energy applications (Invited)

C. Lewinsohn\*, Ceramtec, Inc., USA