

# SESSIONS BY DAY

14<sup>th</sup> International  
Ceramics Congress



Perugia, Italy • June 4-8, 2018



CIMTEC2018

# CIMTEC

2018

## 14<sup>th</sup> INTERNATIONAL CERAMICS CONGRESS

<i>Flowsheet</i>	JUNE 4		JUNE 5		JUNE 6		JUNE 7		JUNE 8	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
REGISTRATION			CA	CA	CA	CA	CA	CA	CA	CA
SYMPORIUM CA			CB	CB	CB	CB	CB	CB	CB	CB
SYMPORIUM CB			CB-8	CB-8	CB-8	CB-8	CB-8	CB-8	CB-9	CB-9
Focused Session CB-8			CB-9	CB-9	CB-9	CB-9	CB-9	CB-9	CB-9	CB-9
Focused Session CB-9			CB-10				CB-10	CB-10		
Focused Session CB-10			CC	CC	CC	CC	CC	CC	CC	CC
SYMPORIUM CC			CD		CD				CD	
SYMPORIUM CD			CE	CE	CE	CE	CE	CE	CE	
SYMPORIUM CE			CF	CF	CF	CF	CF	CF	CF	
SYMPORIUM CF			CG	CG	CG	CG	CG	CG	CG	
SYMPORIUM CG			CH	CH	CH	CH	CH	CH	CH	
SYMPORIUM CH			CI	CI	CI	CI	CI	CI	CI	
SYMPORIUM CI			CJ	CJ	CJ	CJ	CJ	CJ	CJ	
SYMPORIUM CJ			CK	CK	CK	CK	CK	CK	CK	
SYMPORIUM CK			CL	CL	CL	CL	CL	CL	CL	
SYMPORIUM CL			CM	CM	CM	CM	CM	CM	CM	
SYMPORIUM CM			CN	CN	CN	CN	CN	CN	CN	
SYMPORIUM CN			CO	CO	CO	CO	CO	CO	CO	
CONFERENCE CO										
POSTER MOUNTING										
POSTER DISCUSSION										
SOCIALS										



WELCOME RECEPTION



GALA CONCERT



CONFERENCE DINNER

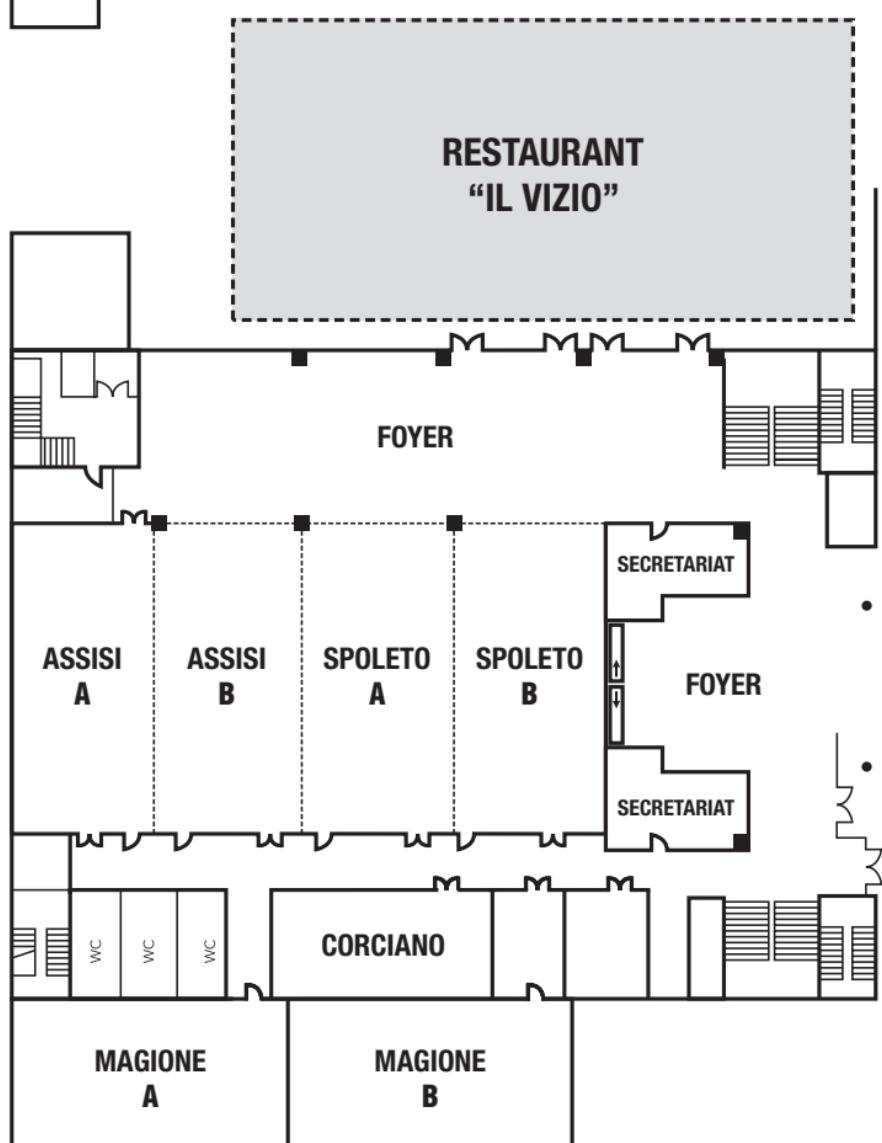
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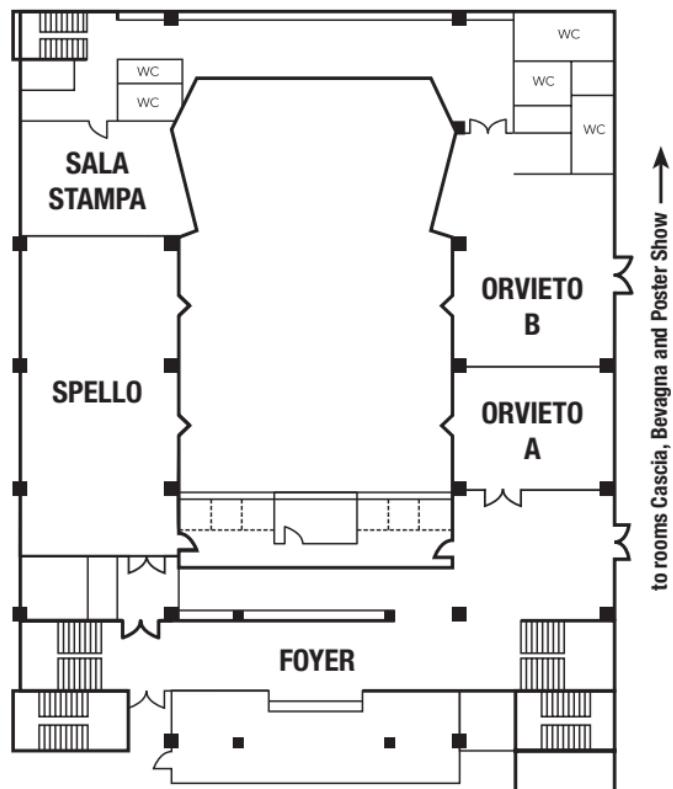
BUSINESS

VIP

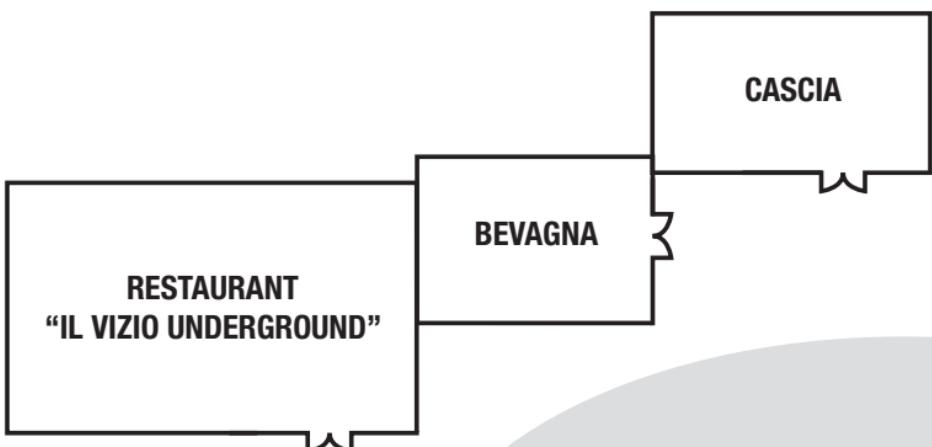
## HOTEL FOYER



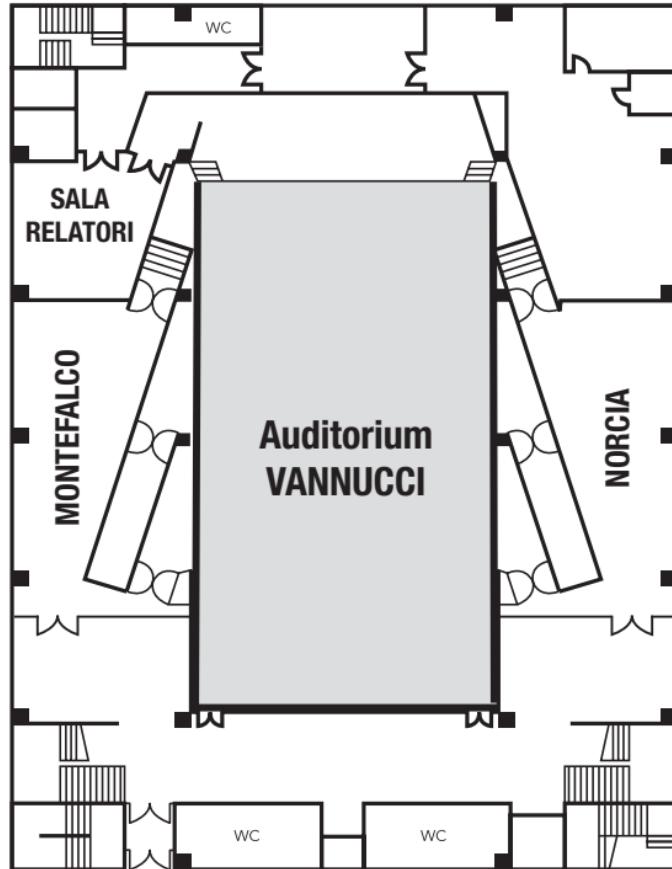
## Ground Floor



## Level -1



## *Level -1*



## *Level -2*

# CONGRESS OUTLINE

## SYMPORIUM CA

Progress in Powder Processing Science and Manufacturing for Advanced Ceramics and Composites

## SYMPORIUM CB

Non Conventional and Emerging Routes to Advanced Ceramics

*Focused Session CB-8*

*Bio-inspired and Bio-enabled Processing*

*Focused Session CB-9*

*Additive Manufacturing*

*Focused Session CB-10*

*SHS Ceramics*

## SYMPORIUM CC

Ceramics and Composites for Enhanced Tribologic and Corrosion Performance in High-demanding Applications

## SYMPORIUM CD

Joining of Inorganic Materials:  
From Macro- to Nano-length Scales

## SYMPORIUM CE

Frontiers in Nanostructured, Nanocomposite and Hybrid Functional Materials for Energy and Sustainability

## SYMPORIUM CF

High and Ultra High Temperature Ceramics and Composites for Extreme Environments

## SYMPORIUM CG

Progress in Nano-laminated Ternary Carbides, Nitrides and Borides (MAX/MAB) Phases and Derivatives Thereof (MXenes)

**SYMPORIUM CH**

Ceramic Thin Films and Coatings for Protective,  
Tribological and Multifunctional Applications

**SYMPORIUM CI**

Porous Ceramics for Environmental Protection,  
Energy-related Technologies and Advanced  
Industrial Cycles

**SYMPORIUM CJ**

Advances in Electroceramics: Processing,  
Structure, Properties, and Applications

**SYMPORIUM CK**

Functional Magnetic Oxides

**SYMPORIUM CL**

Inorganic Materials Systems for Advanced  
Photonics

**SYMPORIUM CM**

Science and Technology for Silicate Ceramics

**SYMPORIUM CN**

Refractories: Meeting Refractory Industry Needs  
of Today and It's Future Challenges

***Serial Conference***

**CO**

***8<sup>th</sup> International Conference***

Advanced Inorganic Fibre Composites for  
Structural and Thermal Management  
Applications

# *Meeting Rooms by Symposia*

OPENING SESSION .....	AUDITORIUM
Symposium CA .....	ASSISI A
Symposium CB .....	ASSISI B
Focused Session CB-8 .....	ASSISI B / SALA STAMPA
Focused Session CB-9 .....	ASSISI B / VIP
Focused Session CB-10 .....	SALA RELATORI
Symposium CC .....	MONTEFALCO
Symposium CD .....	SALA RELATORI
Symposium CE .....	MAGIONE B
Symposium CF .....	ORVIETO A
Symposium CG .....	ORVIETO B / MAGIONE B
Symposium CH .....	SPOLETO B
Symposium CI .....	MAGIONE A
Symposium CJ .....	SPOLETO A
Symposium CK .....	CORCIANO
Symposium CL .....	NORCIA
Symposium CM .....	CASCIA
Symposium CN .....	BEVAGNA
Conference CO .....	SPELLO

## ***Meetings with restricted participation***

IEB Ceramics in Modern Technologies Wednesday June 6 17.00-18.00.....	BUSINESS
World Academy of Ceramics-Advisory Board Thursday June 7 11.00-13.00 .....	BUSINESS
IEB Ceramics International Thursday June 7 16.30-18.00.....	CORCIANO
FIRE AGM Friday June 8 14.30-16.30 .....	CORCIANO

## ***Special Workshop***

Workshop on Joining for High Temperature Applications Friday June 8 15.00-18.00 .....	BEVAGNA
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# *Events by Day*

## **Monday June 4**

15.00-19.00

### REGISTRATION

Centro Congressi Hotel Quattrotorri  
at Best Western Hotel Quattrotorri Perugia  
Via Corcianese 260  
Perugia - Italy

## **Tuesday June 5**

Morning: 9.30-13.00

### **Opening Session**

Welcome Addresses

10.00 - 11.00

Formal Induction of the New  
Members of the World Academy  
of Ceramics (17<sup>th</sup> Election)

Plenary Lectures (C:PL1-PL2)

8.30-13.00

*POSTER MOUNTING*

## **Tuesday June 5**

**Afternoon:** 14.25-18.30

Symposium CA	(CA-1:IL01-IL02) (CA-1:IL04-L06)
Symposium CB	(CB-1:IL01-L05) (CB-8.1:IL01-IL02)
Symposium CC	(CC-1:IL01-IL02) (CC-1:IL04-L06)
Symposium CD	(CD-1:IL01-IL03) (CD-1:IL04-L06)
Symposium CE	(CE-1:IL01-IL03) (CE-1:IL04-IL06)
Symposium CF	(CF-1:IL01+IL03-IL04) (CF-1:IL02+L05) (CF-4:IL04)
Symposium CG	(CG:KL+CG-1:IL01-IL03) (CG-2:IL01-IL02)
Symposium CH	(CH:KL+CH-1:IL01-IL03) (CH-1:IL04-IL05) (CH-5:IL01)
Symposium CI	(CI-1:IL01-IL03) (CI-1:IL04+L06+IL09)
Symposium CJ	(CJ-1:IL01-IL02) (CJ-2:IL02-IL03)
Symposium CK	(CK-1:IL01-IL02) (CK-6:IL03) (CK-2:IL01-IL03)
Symposium CL	(CL-1:IL01-IL02) (CL-1:IL04-IL05)
Symposium CM	(CM-1:IL01-IL03) (CM-2:IL01-IL03)
Symposium CN	(CN-1:IL01-L04) (CN-3:IL01-IL02)
Conference CO	(CO-1:IL01-IL03) (CO-1:IL04-L07)

14.30-18.30

*POSTER MOUNTING*

20.30 - 22.00  
*Welcome Party*

## **Wednesday June 6**

**Morning:** 9.00-13.00

Symposium CA	(CA-2:IL01-L03) (CA-3:IL01-L05)
Symposium CB	(CB-2:IL01-L04) (CB-2:L06-L09) (CB-8.1:IL04-L07) (CB-8.2:IL01-IL02+IL05) (CB-9.1:IL01-L05) (CB-9.2:IL01-L03) (CB-10.2:IL01-L04) (CB-10.1:IL01-IL04)
Symposium CC	(CC-1:IL07-L11) (CC-1:IL12-L14)
Symposium CE	(CE-1:IL07-L09) (CE-1:IL10-IL12)
Symposium CF	(CF-1:IL07-L09) (CF-1:L11) (CF-2:IL02)
Symposium CG	(CG-2:IL03-L06) (CG-3:IL01-IL04)
Symposium CH	(CH-2:IL01-L03) (CH-3:IL01-L05)
Symposium CI	(CI-1:IL08-L12) (CI-1:IL13-L15)
Symposium CJ	(CJ-2:IL05-IL09) (CJ-2:IL10-L12)
Symposium CK	(CK-1:IL03-IL04) (CK-1:IL05-L06)
Symposium CL	(CL-2:IL01-IL03) (CL-2:IL04-L06)
Symposium CM	(CM-1:IL04-L07) (CM-2:IL04-L05)
Symposium CN	(CN-2:IL01-L05) (CN-4:IL01-L03)
Conference CO	(CO-1:IL08-L13) (CO-2:IL01-IL02)

## **Wednesday June 6**

**Afternoon:** 14.30-18.30

Symposium CA	(CA-2:IL04-L07) (CA-1:L07-L08)
Symposium CB	(CB-3:IL02-IL05) (CB-8.2:IL04+IL06) (CB-8.3:IL01-L03) (CB-9.3:IL01-L04) (CB-9.4:IL01-IL02)
Symposium CC	(CC-1:IL15-L17) (CC-1:L19-L20)
Symposium CD	(CD-1:IL07-L09) (CD-2:IL01-L04) (CD-4:IL01)
Symposium CE	(CE-2:IL01-IL04) (CE-2:IL05-L06) (CE-3:IL09)
Symposium CF	(CF-2:IL03-IL04) (CF-2:IL05-IL07)
Symposium CG	(CG-3:IL05-IL06) (CG-4:IL01-L03)
Symposium CH	(CH-4:IL01-L04) (CH-1:IL06-L10)
Symposium CI	(CI-2:IL02-IL04) (CI-1:IL17-IL20)
Symposium CJ	(CJ-1:L04-L07) (CJ-2:L13-L16)
Symposium CK	(CK-3:IL01-IL04) (CK-4:IL01-L02)
Symposium CL	(CL-3:IL02-L04) (CL-4:IL01-IL02)
Symposium CM	(CM-3:IL01-L05) (CM-2:IL07-L09)
Symposium CN	(CN-5:IL01-L03)
Conference CO	(CO-2:IL03-L06) (CO-3:IL01-L03)

## **Thursday June 7**

**Morning:** 9.00-13.00

Symposium CA	(CA-3:IL06-L10) (CA-4:IL01-IL03)
Symposium CB	(CB-4:IL01-L03) (CB-4:IL05-IL06) (CB-8.4:IL01-IL02) (CB-8.4:L04) (CB-8.5:IL01) (CB-9.4:IL03-L06) (CB-9.4-IL07-L09) (CB-10.2:IL05-L07) (CB-10.3-IL01-IL03)
Symposium CC	(CC-2:IL01-IL03) (CC-2:IL05-L07+IL11)
Symposium CE	(CE-2:IL08-L10)
Symposium CF	(CF-3:IL01-L03) (CF-2:IL09-L14)
Symposium CG	(CG-5:IL01-IL04) (CG-5:IL05-L08)
Symposium CH	(CH-4:IL05-L08) (CH-5:IL02-L05)
Symposium CI	(CI-3:IL01-IL03) (CI-4:IL01-L05)
Symposium CJ	(CJ-3:IL01-IL04) (CJ-3:IL05-L08)
Symposium CK	(CK-5:IL01-L05)
Symposium CL	(CL-4:IL04-L08) (CL-5:IL01-IL04)
Symposium CM	(CM-4:IL01+IL04) (CM-5:IL01-L04+IL09)
Symposium CN	(CN-6:IL01-L03) (CN-1:IL02) (CN-4:IL05) (CN-5:IL05-L06)
Conference CO	(CO-3:IL04-IL06) (CO-7:IL01-IL04)

## **Thursday June 7**

**Afternoon:** 14.30-18.30

Symposium CA	(CA-4:IL05-L06) (CA-4:IL07-L09) (CA-5:IL05)
Symposium CB	(CB-5:IL01-L03) (CB-4:IL08-L09) (CB-9.5:IL01-L03) (CB-10.4:IL01-IL03)
Symposium CC	(CC-2:IL08-L10)
Symposium CE	(CE-3:IL02-L05)
Symposium CF	(CF-3:IL04-L07) (CF-3:L08-L12)
Symposium CG	(CG-6:IL01-IL02) (CG-6:IL03-L05)
Symposium CH	(CH-5:IL06-IL07) (CH-5:IL08-L09)
Symposium CI	(CI-5:IL01-IL03) (CI-3:IL04-L07)
Symposium CJ	(CJ-4:IL01-IL03) (CJ-4:IL04-IL06)
Symposium CK	(CK-6:IL01-IL02)
Symposium CM	(CM-4:IL05-L09) (CM-5:L05-L07)
Symposium CN	(CN-6:IL04-L06) (CN-7:IL01-IL03)
Conference CO	(CO-3:IL07-IL08) (CO-3:IL09-L12)

21.30-23.30  
*Opera Concert*

## **Friday June 8**

**Morning:** 9.00-13.00

Symposium CA	(CA-4:IL10-L13) (CA-5:IL03+IL02)
Symposium CB	(CB-6:IL01-L04) (CB-6:IL06-L08) (CB-9.6:IL01-L03) (CB-9.6:IL05-L07)
Symposium CC	(CC-2:L12-L13) (CC-2:IL14-IL15)
Symposium CD	(CD-3:IL04-L06) (CD-3:IL01-L03) (CD-4:IL03)
Symposium CE	(CE-3:IL06-L08) (CE-3:IL10-L12)
Symposium CF	(CF-3:IL13-L15) (CF-4:IL01-L02)
Symposium CG	(CG-8:IL01-IL03) (CG-9:L03-L04)
Symposium CH	(CH-6:IL01-IL03) (CH-7:IL02-IL04)
Symposium CI	(CI-6:IL01-L04) (CI-6:IL05-L08)
Symposium CJ	(CJ-5:IL02-IL03) (CJ-2:L18-IL22)
Symposium CK	(CK-8:IL02-IL04) (CK-9:IL01-IL03)
Symposium CL	(CL-6:IL01-IL03) (CL-7:IL03-L04)
Symposium CM	(CM-5:L10-L13) (CM-5:IL16-IL17)
Conference CO	(CO-4:IL01-IL03) (CO-4:L04-L05) (CO-5:IL01)

## **Friday June 8**

**Afternoon:** 14.30-18.30

- Symposium CA (CA-5:IL04-L06)
- Symposium CB (CB-6:IL09-IL10)
- Symposium CF (CF-4:L03-L07)
- Symposium CG (CG-3:L08-L12)  
(CG-8:L04-L06)  
(CG-9:IL05-L07)
- Symposium CI (CI-6:IL09-L11)
- Symposium CJ (CJ-5:L05-IL10)
- Symposium CL (CL-8:IL01-L04)
- Conference CO (CO-6:IL01-L03)

16.30-18.30  
**POSTER DISCUSSION**

20.30-23.00  
*Conference Dinner*

# SESSIONS FLOWSHEET

June 4-8  
14<sup>th</sup> International  
Ceramics Congress

## Chair

### **Pietro Vincenzini**

World Academy of Ceramics  
National Research Council, Italy

## Co-Chairs

### **Gary Messing**

Penn State University  
World Academy of Ceramics

### **Takashi Goto**

Tohoku University, Japan  
International Ceramic Federation

## Conveners

Symposium CA: **Rajendra K. Bordia**, USA

Symposium CB: **Emanuel Ionescu**, Germany

Focused Session CB-8: **Di Zhang**, China

Focused Session CB-9: **Aldo R. Boccaccini**, Germany

Focused Session CB-10: **Alexander S. Rogachev**, Russia

Symposium CC: **Klaus G. Nickel**, Germany

Symposium CD: **Jolanta Janczak-Rusch**, Switzerland

Symposium CE: **Sanjay Mathur**, Germany

Symposium CF: **William G. Fahrenholtz**, USA

Symposium CG: **Michel W. Barsoum**, USA

Symposium CH: **Rainer Gadow**, Germany

Symposium CI: **Paolo Colombo**, Italy

Symposium CJ: **Brahim Dkhil**, France

Symposium CK: **Agnes Barthelemy**, France

Symposium CL: **Maurizio Ferrari**, Italy

Symposium CM: **Michele Dondi**, Italy

Symposium CN: **Christos C. Aneziris**, Germany

Conference CO: **Mrityunjay Singh**, USA

## **OPENING SESSION**

### **AUDITORIUM**

Pietro VINCENZINI  
General Chair CIMTEC Conferences

*Chair:*  
Mrityunjay SINGH, USA

9.30 - 10.00

Welcome Addresses

Michele FIORONI  
Deputy Mayor of the Municipality of Perugia

Gary MESSING  
World Academy of Ceramics

10.00 - 11.00

Formal induction of the New Members of the  
World Academy of Ceramics (17<sup>th</sup> Election)

### *Plenary Lectures*

11.00 - 11.50

C:PL1

**Fueling Human Progress with Sunlight**  
Harry ATWATER

Joint Center for Artificial Photosynthesis, California Institute  
of Technology, Pasadena, CA, USA

12.00 - 12.50

C:PL2

**Advanced Ceramics for Energy Systems and  
Environmental Technology**

Alexander MICHAELIS

Fraunhofer Institute of Ceramic Technologies and Systems,  
IKTS, Dresden, Germany

**SYMPORIUM CA**

**PROGRESS IN POWDER PROCESSING  
SCIENCE AND MANUFACTURING FOR  
ADVANCED CERAMICS AND COMPOSITES**

*Room: ASSISI A*

*Chair: Rajendra K. BORDIA, USA (Convener)*

**14.25 Welcome**

**Session CA-1 - Advances in Powder Synthesis and Characterisation**

- 14.30 CA-1:IL01 **Magnetic Field Assisted Freeze Casting of Ceramic Powders**  
**J. McKITTRICK**, University of California San Diego, La Jolla, CA, USA; M.M. PORTER, Clemson University, Clemson, SC, USA; M.B. FRANK, nanoComposix, Inc., San Diego, CA, USA
- 15.00 CA-1:IL02 **Synthesis and Characterization of Nanoparticles**  
**M.-A. EINARSRUD**, M. SLENTNES, T.O.L. SUNDE, P.M. RORVIK, A. DALOD, T. GRANDE, Department of Materials Science and Engineering, NTNU Norwegian University of Science and Technology, Trondheim, Norway
- 15.30 *Break*

*Chair: Joanna McKITTRICK, USA*

- 16.00 CA-1:IL04 **Spray Pyrolysis of Fine Oxide Powder**  
**K. WIIK**, NTNU, Trondheim, Norway; S. LABONNOTE-WEBER, G. SYVERTSEN-WIIG, CerPoTech AS, Heimdal, Norway
- 16.30 CA-1:L05 **Synthesis of Submicronic Silica Janus Particles by a Pickering Emulsion Method: Towards the Characterization of their Assemblies**  
**K. LEBDIOUA**, A. AIMABLE, M. CERBELAUD, A. VIDEKOQ, SPCTS, Limoges, France
- 16.50 CA-1:L06 **Synthesis of Indium Hydroxide Powders by a Precipitation Method**  
**WOO-SEOK CHO<sup>1</sup>**, EUN-KYOUNG CHOI<sup>1, 2</sup>, WON-JUN LEE<sup>1, 3</sup>, KYU-SUNG HAN<sup>1</sup>, UNG-SOO KIM<sup>1</sup>, JIN-HO KIM<sup>1</sup>, KWANG-TEAK HWANG<sup>1</sup>, JONG-YOUNG KIM<sup>1</sup>, HAE-JIN HWANG<sup>3</sup>, KWANG-BO SHIM<sup>2</sup>, <sup>1</sup>Korea Institute of Ceramic Engineering and Technology, Icheon, South Korea; <sup>2</sup>Dept. of Materials Science and Engineering, Hanyang University, Seoul, South Korea; <sup>3</sup>School of Material Science and Engineering, Inha University, Incheon, South Korea

**SYMPORIUM CB**

**NON CONVENTIONAL AND EMERGING  
ROUTES TO ADVANCED CERAMICS**

*Room: ASSISI B*

*Chair: Emanuel IONESCU, Germany (Convener)*

**14.25 Welcome**

**Session CB-1 - Solution-based Processing**

- 14.30 CB-1:IL01 From Inorganic Molecules to Functional Oxide Materials: A Liasson towards Electronic Device Applications**  
S. SANCTIS, J. KRAUSMANN, R.C. HOFFMANN, **J.J. SCHNEIDER**, Eduard-Zintl-Institut für Anorganische und Physikalische Chemie, Technische Universitaet Darmstadt, Darmstadt, Germany

- 15.00 CB-1:IL02 Solution Based Processing of Nanotitania Allotropes and their Applications in Energy and Environment**  
**S. CASSAIGNON**, Sorbonne University (UPMC), Chimie de la Matière Condensée de Paris, CNRS UMR7574, Paris, France

- 15.30 CB-1:IL03 Gallium-based Oxynitride Nanoparticles and their Photocatalytic Activity**  
**YUSUKE ASAKURA**, SHU YIN, Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Sendai, Japan

- 15.50 CB-1:IL05 Photocatalytic Activities of Carbon-doped TiO<sub>2</sub> Based Composites**  
**CHIAKI NODA**, YUSUKE ASAKURA, SHU YIN, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan

**16.10 Break**

**Focused Session CB-8**

**BIO-INSPIRED AND BIO-ENABLED  
PROCESSING**

*Chair: Di ZHANG, China (Convener)*

**16.45 Welcome**

**Session CB-8.1 - Self-assembly, Mineralization and Hierarchical Organization; Hybrid Structures**

- 16.50 CB-8.1:IL01 Designed Construction of Nanostructured Inorganic and Hybrid Materials: Similarities between Natural & Synthetic Approaches**  
**C. SANCHEZ**, Collège de France, Lab. de Chimie de la Matière Condensée de Paris, CNRS, Univ. Pierre et Marie Curie, Paris, France

- 17.20 CB-8.1:IL02 Protein-based Functionalization of Diatom Biosilica**  
**N. KROEGER**, E. KUMARI, N. DUBEY, G. BEGUM, B CUBE Center for Molecular Bioengineering, Dresden University of Technology, Dresden, Germany

**SYMPORIUM CC**

**CERAMICS AND COMPOSITES FOR  
ENHANCED TRIBOLOGIC AND CORROSION  
PERFORMANCE IN HIGH-DEMANDING  
APPLICATIONS**

*Room: MONTEFALCO*

*Chair: Klaus G. NICKEL, Germany (Convener)*

**14.25 Welcome**

**Session CC-1 - Friction and Wear**

- 14.30 CC-1:IL01 Strategies for Developing Hard Coatings for Demanding Application**  
**P.H. MAYRHOFER**, Materials Science and Technology, TU Wien, Vienna, Austria
- 15.00 CC-1:IL02 Structured and Layered Coatings for Reduction of Wear**  
**DAE-EUN KIM**, School of Mechanical Engineering, Yonsei University, Seoul, South Korea

**15.30 Break**

*Chair: Dae-Eun KIM, South Korea*

- 16.00 CC-1:IL04 Ceramic/Carbon Nanofiller Composites: New Materials with Improved Tribological Performance**  
**M. BELMONTE**, P. MIRANZO, M. I. OSENDI, Institute of Ceramics and Glass (ICV-CSIC), Madrid, Spain
- 16.30 CC-1:IL05 Hollow Spherical and Nanosheet-base BN Nanoparticles as Perspective Additives for Friction and Wear Reduction. Correlation between Large-scale Friction Behavior and In situ TEM Compression Testing**  
**D.V. SHTANSKY<sup>1</sup>**, A.V. BONDAREV<sup>1</sup>, A.M. KOVALSKII<sup>1</sup>, K.L. FIRESTEIN<sup>1,2</sup>, P.A. LOGINOV<sup>1</sup>, D.A. SIDORENKO<sup>1</sup>, N.V. SHVINDINA<sup>1</sup>, I.V. SUKHORUKOVA<sup>1</sup>, <sup>1</sup>National University of Science and Technology "MISIS", Moscow, Russia; <sup>2</sup>School of Chemistry, Physics and Mechanical Engineering, Queensland University of Technology (QUT), Brisbane, QLD, Australia
- 16.50 CC-1:IL06 Frictional Behavior and Properties of Fabric Reinforced C/SiC Brake Pads on a Steel Brake Disk**  
**S. FLAUDER**, N. LANGHOF, W. KRENKEL, University of Bayreuth, Ceramic Materials Engineering, Bayreuth, Germany

**SYMPORIUM CD**

**JOINING OF INORGANIC MATERIALS: FROM MACRO- TO NANO-LENGTH SCALES**

*Room:* **SALA RELATORI**

*Chair:* Jolanta JANCZAK-RUSCH, Switzerland (*Convener*)

14.25 *Welcome*

**Session CD-1 - Nano-scale Interface of Dissimilar Materials**

- 14.30 **CD-1:IL01 New Cu / Ceramics Bonding Technology for Highly Reliable Power Module Substrates**  
**YOSHIYUKI NAGATOMO**, NOBUYUKI TERASAKI, YOSHIROU KUROMITSU, Mitsubishi Materials Corporatin, Central Rearch Institute, Saitama, Japan
- 15.00 **CD-1:IL02 Interface Engineering of Nanostructured Joining Materials**  
**L.P.H. JEURGENS**, B. RHEINGANS, M. CHIODI, V. ARAULLO-PETERS, C. CANCELLIERI, J. JANCZAK-RUSCH, Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Joining Technologies & Corrosion, Duebendorf, Switzerland
- 15.30 **CD-1:IL03 The Temperature and Time Dependence of Nanoscale Chemical Reactions at Braze Alumina Joints**  
**P.M. MALLINSON**, AWE Plc, Reading, UK, M. ALI, K.M. KNOWLES, University of Cambridge, UK

16.00 *Break*

*Chair:* Yoshiyuki NAGATOMO, Japan

- 16.30 **CD-1:IL04 Defining Hetero-epitaxial Relationships of Films on Substrates**  
**D. CHATAIN**, CINAM, Aix Marseille Univ, CNRS, Marseille, France; P. WYNBLATT, A.D. ROLLETT, MSE, Carnegie Mellon University, Pittsburgh PA, USA; U. DAHMEN, NCEM-Molecular Foundry, LBNL, Berkeley, CA, USA
- 17.00 **CD-1:L05 Wetting and Braze of Vitreous Carbon by Reactive Ag-Cu-In-Ti Alloys**  
M. TAZI, V. CHAUMAT, Univ. Grenoble Alpes, CEA, LITEN, DTBH, LCA, Grenoble, France; **F. HODAJ**, Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMAP, Grenoble, France
- 17.20 **CD-1:L06 Effect of Point Defects on Interfacial Bonding Between Noble Metal and TiO<sub>2</sub>(110) Surface**  
**KATSUYUKI MATSUNAGA**, Department of Materials Physics, Nagoya University, Aichi, Japan; Nanostructures Research Laboratory, Japan Fine Ceramics Center, Aichi, Japan

**SYMPORIUM CE**  
**FRONTIERS IN NANOSTRUCTURED,**  
**NANOCOMPOSITE AND HYBRID**  
**FUNCTIONAL MATERIALS FOR ENERGY AND**  
**SUSTAINABILITY**

*Room:* **MAGIONE B**

*Chair:* Sanjay MATHUR, Germany (*Convener*)

14.25 *Welcome*

**Session CE-1 - Innovative Processing of Nano-  
and Heterostructures and Films of  
Functional Materials**

14.30 **CE-1:IL01 Low Cost Solution Processing of Nanowires for Flexible Devices**

**YOUNG-JEI OH**, B.-W. WANG, Opto/Electronic Materials & Devices Research Center, Korea Institute of Science and Technology (KIST), Seoul, South Korea; Department of Nanomaterials Science and Engineering, University of Science and Technology (UST), Dae-Jeon, South Korea

15.00 **CE-1:IL02 2D Oxide Nanosheets as Single-crystal Templates to Control Growth and Properties of Functional Oxides**

**A. TEN ELSHOF**, MESA+ Institute for Nanotechnology, University of Twente, AE Enschede, The Netherlands

15.30 **CE-1:IL03 TiO<sub>2</sub>-based Nanocrystals with Reduced Symmetry**

**P.D. COZZOLI**, Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento, Lecce, Italy

16.00 *Break*

*Chair:* Davide COZZOLI, Italy

16.30 **CE-1:IL04 Complex Composition and Structure Materials by Solution Chemistry**

**G. WESTIN<sup>1</sup>**, S.N. KATEA<sup>1</sup>, M. LEIDEBORG<sup>1, 3</sup>, K. LASHGARI<sup>1,3</sup>, K. JANSSON<sup>2</sup>, <sup>1</sup>Chemistry-Angstroem, Angstroem Laboratory, Uppsala University, Uppsala, Sweden; <sup>2</sup>Materials and Environmental Chemistry, Arrhenius Laboratory, Stockholm University, Stockholm, Sweden; <sup>3</sup>S-Solar, Finspang, Sweden

17.00 **CE-1:IL05 Low-temperature Synthesis of Metastable Materials with Anisotropic Morphology**

**S. BARTH**, TU Wien, Institute of Materials Chemistry, Vienna, Austria

17.30 **CE-1:IL06 Focused-ion-beam-enabled Electroless Metal Deposition on Silicon and Fabrication of Probes for Tip-enhanced Raman Spectroscopy**

**MASAYUKI NISHI**, Kyoto University, Kyoto, Japan

**SYMPORIUM CF**

**HIGH AND ULTRA HIGH TEMPERATURE  
CERAMICS AND COMPOSITES FOR EXTREME  
ENVIRONMENTS**

*Room: ORVIETO A*

*Chair: William G. FAHRENHOLTZ, USA (Convener)*

**14.25 Welcome**

**Session CF-1 - Synthesis and Processing**

**14.30 CF-1:IL01 Beyond YSZ For High Temperature Gas Turbines and Aerospace**

**D.R. CLARKE**, Harvard University Cambridge, MA, USA

**15.00 CF-1:IL03 Synthesis, Processing and Characterization of Thermal Barrier Ceramics Based on Gd<sub>2</sub>Hf<sub>2</sub>O<sub>7</sub> Pyrochlore Structure**

**B. MATOVIC<sup>1</sup>**, J. MALETASKIC<sup>1, 2</sup>, J. LUKIC<sup>1</sup>, M. PREKAJSKI DJORDJEVIC<sup>1</sup>, M. FAJAR<sup>2</sup>, K. YOSHIDA<sup>2</sup>, T. YANO<sup>2</sup>, <sup>1</sup>Centre of Excellence-CextremeLab, Institute for Nuclear Sciences Vinca, University of Belgrade, Belgrade, Serbia; <sup>2</sup>Lab. for Advanced Nuclear Energy, Institute of Innovative Research, Tokyo Institute of Technology, Okayama, Meguro-ku, Tokyo, Japan

**15.30 CF-1:IL04 Fast Densification of UHT Ceramics and Composites by SPS**

**D. SCITI**, L. SILVESTRONI, L. ZOLI, ISTEC-CNR, Faenza, Italy

**16.00 Break**

*Chair: David CLARKE, USA*

**16.30 CF-1:IL02 Ultra-high Temperature Ceramic Matrix Composites (UHTCMCs)**

**J. BINNER**, V. RUBIO, M. PORTER, University of Birmingham, Edgbaston, Birmingham, UK

**17.00 CF-1:L05 Synthesis of Ultra-fine Hafnium Carbide Powders Combining the Methods of Liquid Precursor Conversion and Plasma Activated Sintering**

**WEIMIN M. WANG**, D.L. LU, H. WANG, F. ZHANG, J. WEI, Z.Y. FU, State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, China

**Session CF-4 - Characterization and Analysis**

**17.20 CF-4:IL04 Nanometer-scale Computer Simulation of Structure and Mechanical Properties of UHT Ceramics**

**D. BRENNER**, S. DAIGLE, M. LIM, M. DELOWER HOSSAIN, J.-P. MARIA, Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC, USA; C. TOHER, P. SARKER, S. CURTAROLO, Department of Mechanical Engineering and Materials Science, Duke University, Durham, NC, USA

**SYMPORIUM CG**

**PROGRESS IN NANO-LAMINATED TERNARY  
CARBIDES, NITRIDES AND BORIDES  
(MAX/MAB) PHASES AND DERIVATIVES  
THEREOF (MXENES)**

*Room: ORVIETO B*

*Chair: Michel W. BARSOUM, USA (Convener)*

**14.25 Welcome**

**14.30 CG:KL Expanding the Structural and Elemental Space of MAX Phases and MXenes**

**J. ROSEN**, Linköping University, Department of Physics, Chemistry and Biology (IFM), Linköping, Sweden

**Session CG-1 - Bulk and Thin Film Transport Properties of the MAX/MAB/MXenes**

**15.10 CG-1:IL01 Transport Properties in MAX Single Crystals and MXenes**

**T. OUISSE**<sup>1</sup>, D. PINEK<sup>1</sup>, M.W. BARSOUM<sup>2</sup>, T. ITO<sup>3</sup>, <sup>1</sup>Université Grenoble-Alpes, CNRS, LMGP, Grenoble, France; <sup>2</sup>Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA; <sup>3</sup>Synchrotron Radiation Research Center, Nagoya University, Nagoya, Japan

**15.40 CG-1:IL02 Mn<sub>2</sub>GaC Thin Films: Magnetic MAX Phase from Theory and Experiment**

**A.S. INGASON**<sup>1,2</sup>, M. DAHLQVIST<sup>1</sup>, A. MOCKUTE<sup>1</sup>, A. PETRUHINS<sup>1</sup>, G.K. PALSSON<sup>3, 4</sup>, J. ROSEN<sup>1</sup>, <sup>1</sup>Thin Film Physics, Department of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden; <sup>2</sup>Grein Research, Reykjavik, Iceland; <sup>3</sup>Dept. of Physics and Astronomy, Uppsala University, Uppsala, Sweden; <sup>4</sup>Institut Laue-Langevin, Grenoble, France

**16.10 CG-1:IL03 Ab-initio Calculations of the Thermoelectric Properties of MXenes**

**U. SCHWINGENSCHLOGL**, Physical Science and Engineering Division (PSE), King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia

**16.40 Break**

*Chair: Arni S. INGASON, Iceland*

**Session CG-2 - New MAX/MAB/MXenes**

**17.10 CG-2:IL01 Prediction and Synthesis of New MAX Phases with in- and out of Plane Chemical Ordering**

**M. DAHLQVIST**, JUN LU, R. MESHKIAN, QUANZHENG TAO, L. HULTMAN, J. ROSEN, Department of Physics, Chemistry, and Biology (IFM), Linköping University, Linköping, Sweden

**17.40 CG-2:IL02 Novel Zr-based MAX Phase Solid Solutions**

**J. VLEUGELS**<sup>1</sup>, T. LAPAUW<sup>1, 2</sup>, B. TUNCA<sup>1, 2</sup>, K. VAN LOO<sup>1</sup>, K. LAMBRINOU<sup>2</sup>, <sup>1</sup>KU Leuven, Department of Materials Engineering, Heverlee, Belgium; <sup>2</sup>SCK•CEN, Mol, Belgium

**SYMPORIUM CH**

**CERAMIC THIN FILMS AND COATINGS  
FOR PROTECTIVE, TRIBOLOGICAL AND  
MULTIFUNCTIONAL APPLICATIONS**

*Room: SPOLETO B*

*Chair: Rainer GADOW, Germany (Convener)*

**14.25 Welcome**

- 14.30 CH:KL Functional Surfaces and Coatings - New ceramic technologies for the benefit of industries and mankind -**  
**R. GADOW**, University of Stuttgart, Stuttgart, Germany

**Session CH-1 - Advances in Deposition, Surface Modification and Characterisation Techniques**

- 15.10 CH-1:IL01 Observing Unobservable: Active Diagnostics of Electrolytic Plasma Processes for In-situ Identification of Surface Properties**  
**A. YEROKHIN**, University of Manchester, Manchester, UK
- 15.40 CH-1:IL02 Cold Spray: From Coating to Additive Manufacturing**  
**B. JODOIN**, D. McDONALD, P. DUPUIS, Y. CORMIER, University of Ottawa, Ottawa, ON, Canada
- 16.10 CH-1:IL03 Deposition Mechanisms in Hybrid Molecular Beam Epitaxy of Complex Ceramic Oxides**  
R.P. HARKINS, TIANQI WANG, A. PRAKASH, C.J. CRAMER, B. JALAN, **W.L. GLADFELTER**, Departments of Chemistry and Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, USA
- 16.40 Break**

*Chair: Wayne GLADFELTER, USA*

- 17.00 CH-1:IL04 Plasma Enhanced Magnetron Sputter (PEMS) Deposition of Ceramic Coatings for Extreme Environments**  
**RONGHUA WEI**, Southwest Research Institute, San Antonio, TX, USA
- 17.30 CH-1:IL05 High Velocity Flame Spraying (HVSFS) of Nano-structured Coatings and Related Industrial Applications**  
R. GADOW, **A. KILLINGER**, University of Stuttgart, Institute for Manufacturing Technologies of Ceramic Components and Composites (IFKB), Stuttgart, Germany

**Session CH-5 - Smart and Multifunctional Thin Films and Coatings**

- 18.00 CH-5:IL01 Amorphous Alumina Tunable Barrier Films: An Integrated Process-local Coordination-properties Investigation**  
**C. VAHLAS**, D. SAMELOR, CIRIMAT, Toulouse, France; V. SAROU-KANIAN, P. FLORIAN, CEMHTI, Orléans, France; B. CAUSSAT, H. VERGNES, LGC, Toulouse, France

**SYMPORIUM CI**

**POROUS CERAMICS FOR ENVIRONMENTAL  
PROTECTION, ENERGY-RELATED  
TECHNOLOGIES AND ADVANCED  
INDUSTRIAL CYCLES**

*Room: MAGIONE A*

*Chair: Paolo COLOMBO, Italy (Convener)*

**14.25 Welcome**

**Session CI-1 - Novel Synthesis and Processing**

- 14.30 CI-1:IL01 Colloidal Processing of CeO<sub>2</sub> Pellets with Hierarchical Porosity as Spent Fuel Matrix Analogue**  
S. FERNANDEZ, J. COBOS, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Madrid, Spain;  
**R. MORENO**, Instituto de Cerámica y Vidrio, Consejo Superior de Investigaciones Científicas, Madrid, Spain
- 15.00 CI-1:IL02 Novel Processing of Open Celled Glass and Glass-ceramic Foams**  
**E. BERNARDO**, A. RINCON ROMERO, P. RABELO MONICH, H. ELSAYED, Università degli Studi di Padova, Dipartimento di Ingegneria Industriale, Padova, Italy
- 15.30 CI-1:IL03 Fabrication of Porous Si<sub>3</sub>N<sub>4</sub>/SiC Ceramics via Rapid Nitridation Processing and ZrO<sub>2</sub> as Catalyst**  
**YUPING ZENG**, Shanghai Institute of Ceramics, CAS, Shanghai, China
- 16.00 Break**

*Chair: Rodrigo MORENO, Spain*

- 16.30 CI-1:IL04 Additive Manufacturing of Porous Ceramics using Inorganic Polymers**  
**P. COLOMBO**, University of Padova, Dept. Industrial Engineering, Padova, Italy
- 17.00 CI-1:L06 Solidification Templating of Porous Polysilazane-derived Ceramics**  
**T. KONEGGER**, R. OBMANN, TU Wien, Institute of Chemical Technologies and Analytics, Vienna, Austria
- 17.20 CI-1:IL09 Reticulated Porous Ceramics – Cellular Structures for a Multitude of Functionalization Strategies**  
**M. SCHEFFLER**, S. RANNABAUER, Inst. of Material and Joining Technology, University of Magdeburg, Germany; U. BETKE, A. LIEB, F. SCHEFFLER, Inst. of Industrial Chemistry, University of Magdeburg, Germany

**SYMPORIUM CJ**

**ADVANCES IN ELECTROCERAMICS:  
PROCESSING, STRUCTURE, PROPERTIES,  
AND APPLICATIONS**

*Room: SPOLETO A*

*Chair: Brahim DKHIL, France (Convener)*

**14.25 Welcome**

**Session CJ-1 - Dielectrics and Microwave Materials**

- 14.30 **CJ-1:IL01 Ultra-Low Temperature Co-fired Ceramics (ULTCC) – Current Situation and What is Needed for Industrial Applications**  
J. VARGHESE, M.Y. CHEN, N. JOSEPH, M. SOBOCINSKI, **H. JANTUNEN**, Microelectronics Research Unit, University of Oulu, Faculty of Information Technology and Electrical Engineering, Oulu, Finland
- 15.00 **CJ-1:IL02 Microwave and THz Characterization of Electrocera-mics**  
D. JABLONSKAS, M. IVANOV, J. MACUTKEVIC, S. RUDYS, R. GRIGALAITIS, S. LAPINSKAS, S. SVIRSKAS, **J. BANYS**, Vilnius University, Vilnius, Lithuania

**15.30 Break**

*Chair: Heli JANTUNEN, Finland*

**Session CJ-2 - Ferroelectric, Piezoelectric, Pyroelectric, and Ferroelastic Ceramics**

- 16.00 **CJ-2:IL02 Domain Walls in Multiferroic Bismuth Ferrite: An Ab Initio Study**  
**O. DIEGUEZ**, Department of Materials Science and Engineering, Tel Aviv University, Tel Aviv, Israel
- 16.30 **CJ-2:IL03 Niobate Based Lead-free Ceramics for Piezoelectric and Energy Storage Applications**  
**JING-FENG LI**, School of Materials Science and Engineering, Tsinghua University, Beijing, China

**SYMPORIUM CK  
FUNCTIONAL MAGNETIC OXIDES**

*Room:* **CORCIANO**

*Chair:* Agnes BARTHELEMY, France (*Convener*)

14.25 *Welcome*

**Session CK-1 - Magnetic Oxide Thin Films Interfaces and Heterostructures**

- 14.30 **CK-1:IL01 Engineering the Functional Properties of 2-dimensional Electron Gases at Oxide Interfaces**  
**F. MILETTO GRANOZIO**, CNR-SPIN, Napoli, Italy

- 15.00 **CK-1:IL02 Tuning the Properties of Oxide Heterostructures by Interfacial Oxygen Octahedral Coupling**  
**G. KOSTER**, University of Twente, Enschede, The Netherlands

**Session CK-6 - Coexistence of Superconductivity and Magnetism**

- 15.30 **CK-6:IL03 Helical Magnetic Order and Pressure Induced Superconductivity in Binary Pnictides CrAs and MnP**  
**R. KHASANOV**, A. AMATO, P.K. BISWAS, P. BONFA', I. EREMIN, Z. GUGUCHIA, H. LUETKENS, E. MORENZONI, R. DE RENZI, CH. RÜEGG, A.S. SEFAT, M.A. SUSNER, N.D. ZHIGADLO, Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institut, Villigen, Switzerland

16.00 *Break*

*Chair:* Fabio MILETTO GRANOZIO, Italy

**Session CK-2 - Spin Transport in Magnetic Oxides**

- 16.30 **CK-2:IL01 Spin/Charge Interconversion in Oxide Two-dimensional Electron Gases**  
M. BIBES, **F. TRIER**, Unité Mixte de Physique CNRS/Thales, Palaiseau, France

- 17.00 **CK-2:IL02 Transport Phenomena in Heterostructures of Strong Spin-orbit Interaction Oxides**  
**JOBU MATSUNO**, RIKEN Center for Emergent Matter Science (CEMS), Saitama, Japan

- 17.30 **CK-2:IL03 Spin Seebeck Effects in Magnetic-oxide-based Multilayers**  
**R. RAMOS<sup>1</sup>**, T. KIKKAWA<sup>1,2</sup>, A. ANADON<sup>3</sup>, I. LUCAS<sup>3</sup>, R. IGUCHI<sup>4</sup>, S. DAIMON<sup>1,2</sup>, K. UCHIDA<sup>4,5</sup>, H. ADACHI<sup>6</sup>, P.A. ALGARABEL<sup>7</sup>, L. MORELLON<sup>3</sup>, M.H. AGUIRRE<sup>8</sup>, S. MAEKAWA<sup>6</sup>, M.R. IBARRA<sup>8</sup>, E. SAITO<sup>1,2,9,6</sup>, <sup>1</sup>AIMR, Tohoku University, Sendai, Japan; <sup>2</sup>IMR, Tohoku University, Sendai, Japan; <sup>3</sup>Fundacion INA and Depto de Fisica de la Materia Condensada, Univ. de Zaragoza, Spain; <sup>4</sup>NIMS, Tsukuba, Japan; <sup>5</sup>PRESTO, Japan Science and Technology Agency, Saitama, Japan; <sup>6</sup>ASRC, Japan Atomic Energy Agency, Tokai, Japan; <sup>7</sup>Dept. de Fisica de la Materia Condensada and ICMA, Univ. de Zaragoza and CSIC, Zaragoza, Spain; <sup>8</sup>Fundacion INA and Dept. de Fisica de la Materia Condensada and Lab. de Microscopias Avanzadas, Univ. de Zaragoza, Spain; <sup>9</sup>CSRN, Tohoku University, Sendai, Japan

**SYMPORIUM CL  
INORGANIC MATERIALS SYSTEMS  
FOR ADVANCED PHOTONICS**

*Room:* **NORCIA**

*Chair:* Maurizio FERRARI, Italy (*Convener*)

14.25 *Welcome*

**Session CL-1 - Photonic Nanomaterials and Nano-structures**

- 14.30 **CL-1:IL01 Synthesis of Nanoparticles: the Role of Chemical Parameters Toward Functional Materials**

**A. LAURIA**, Laboratory for Multifunctional Materials, Swiss Federal Institute of Technology (ETH-Zurich), Zürich, Switzerland

- 15.00 **CL-1:IL02 Yb<sup>3+</sup> Photoluminescence Enhancement by Disordered Plasmonic Networks Assembled on Anisotropic Crystals**

**L. SANCHEZ-GARCIA**, M.O. RAMIREZ, L.E. BAUSA, Dept. Fisica de Materiales, Universidad Autónoma de Madrid, Madrid, Spain; J.J. CARVAJAL, R. SOLE, M. AGUILLO, F. DIAZ, Fisica i Cristal·lografia de Materials i Nanomaterials, Universitat Rovira i Virgili, Tarragona, Spain

15.30 *Break*

*Chair:* Alessandro LAURIA, Switzerland

- 16.00 **CL-1:IL04 Colloidal Nanocrystals: Functional Materials for Photonic Applications**

**M. STRICCOLI**<sup>1</sup>, E. FANIZZA<sup>2,1</sup>, A. PANNIELLO<sup>1</sup>, N. DEPALO<sup>1</sup>, M. CORRICELLI<sup>1</sup>, C. INGROSSO<sup>1</sup>, R. COMPARRELLI<sup>1</sup>, A. AGOSTIANO<sup>2,1</sup>, M.L. CURRI<sup>1</sup>, <sup>1</sup>CNR IPCF Bari c/o Chem. Dept., University of Bari, Bari, Italy; <sup>2</sup>Chemistry Dept., University of Bari, Bari, Italy

- 16.30 **CL-1:IL05 Integrated Lithium Niobate Photonics**

**M.A. BAGHBAN**, K. GALLO, Department of Applied Physics, KTH-Royal Institute of Technology, Stockholm, Sweden

**SYMPORIUM CM  
SCIENCE AND TECHNOLOGY FOR  
SILICATE CERAMICS**

*Room: CASCIA*

*Chair: Michele DONDI, Italy (Convener)*

**14.25 Welcome**

**Session CM-1 - Smart Silicate Ceramics**

**14.30 CM-1:IL01 Functionalised Exposed Building Materials**

**D.M. TOBALDI<sup>1</sup>, L. GRAZIANI<sup>2</sup>, B FIGUEIREDO<sup>3</sup>, M.N. CAPELA<sup>1</sup>, R. SILVA<sup>3</sup>, L. HENNETIER<sup>4</sup>, V ABRANTES<sup>3</sup>, P. FERREIRA<sup>5</sup>, M.P. SEABRA<sup>1</sup>, E. QUAGLIARINI<sup>2</sup>, J.A. LABRINCHA<sup>1</sup>,** <sup>1</sup>Dept. of Materials and Ceramics Engineering/CICECO - Aveiro Institute of Materials, University of Aveiro, Campus Universitário de Santiago, Aveiro, Portugal; <sup>2</sup>Polytechnic University of Marche, Dept. of Civil and Building Engineering and Architecture, Ancona, Italy; <sup>3</sup>Graphenest, S.A., Lugar da Estação, Edificio Vouga Park, Paradela do Vouga, Portugal; <sup>4</sup>Technological Center for Ceramic and Glass Industries, CTCV, Coimbra, Portugal; <sup>5</sup>RECER, Indústria de Revestimentos Cerâmicos, S.A., Oliveira do Bairro, Portugal

**15.00 CM-1:IL02 Energy Efficient Manufacturing of Ceramic Wall Tiles With and Without Functionality**

**F. KARA**, Department of Materials Science and Engineering, Anadolu University, Eskisehir, Turkey

**15.30 CM-1:IL03 Enhancing Silicate Ceramics with Photocatalytic Activity**

**A. SEVER SKAPIN**, E. ŠVARA FABJAN, N. ROZMAN, L. ŠKRLEP, P. NADRAH, National Building and Civil Engineering Institute of Slovenia, Ljubljana, Slovenia

**16.00 Break**

*Chair: Maximinina ROMERO, Spain*

**Session CM-2 - Green Silicate Ceramics**

**16.30 CM-2:IL01 Valorization of Industrial Wastes in Green Ceramic Products**

RUI M. NOVAIS, L. BURUBERRI, J. CARVALHEIRAS, J. CARNEIRO, M. SAELI, M.P. SEABRA, **J.A. LABRINCHA**, Dept. of Materials and Ceramic Engineering / CICECO-Aveiro Institute of Materials, University of Aveiro, Campus Univ. de Santiago, Aveiro, Portugal

**17.00 CM-2:IL02 Porcelain Stoneware Tiles Above and Beyond Innovation: a Break with Tradition**

**E. RAMBALDI**, Centro Ceramic, Bologna, Italy

**17.30 CM-2:IL03 Synthesizing Building Ceramics with High Crystallinity and Improved Properties from High Amounts of Industrial Wastes**

**A. KARAMANOV**, E. KARAMANOVA, G. AVDEEV, S. ATANASOVA-VLADIMIROVA, Institute of Physical Chemistry "Acad. Rostislav Kaishev", Bulgarian Academy of Sciences, Sofia, Bulgaria

**SYMPORIUM CN**

**REFRACTORIES: MEETING REFRACTORY  
INDUSTRY NEEDS OF TODAY AND IT'S  
FUTURE CHALLENGES**

*Room: BEVAGNA*

*Chair: Christos G. ANEZIRIS, Germany (Convener)*

**14.25 Welcome**

**Session CN-1 - Raw Materials Needs**

- 14.30 CN-1:IL01 Fabrication and Characterization of Highly Porous Alumina using Platelets**  
**SHINOBU HASHIMOTO**, SAWAO HONDA, YUSUKE DAIKO, YUJI IWAMOTO, Nagoya Institute of Technology, Department of Life Science and Applied Chemistry, Nagoya, Japan
- 15.00 CN-1:IL03 Meeting the Future Needs of Refractory Raw Materials through Innovation**  
**H.S. TRIPATHI**, Refractory & Traditional Ceramics Division, CSIR-Central Glass & Ceramic Research Institute, Kolkata, India
- 15.30 CN-1:IL04 Characterization of Porous Alumina Bodies Fabricated by High-temperature Evaporation of Boric Acid with Sodium Impurity**  
**DAIMU MUTO**, SHINOBU HASHIMOTO, SAWAO HONDA, YUSUKE DAIKO, YUJI IWAMOTO, Nagoya Institute of Technology, Department of Life Science and Applied Chemistry, Nagoya, Japan

**15.50 Break**

*Chair: Shinobu HASHIMOTO, Japan*

**Session CN-3 - Product Manufacturing and Installation**

- 16.20 CN-3:IL01 Carbon-bonded Monolithic: Innovation and Perspectives**  
**C. PAGLIOSA<sup>1</sup>**, V.C. PANDOLFELLI<sup>2</sup>, <sup>1</sup>MAGNESITA S.A., Contagem, Brazil; <sup>2</sup>Federal University of São Carlos (UFSCar), Brazil
- 16.50 CN-3:IL02 Applications of Microwave Heating to Refractory Materials**  
**HATSUO TAIRA**, Krosaki Harima Corporation, Kitakyusyu, Japan

CO - 8th International Conference  
**ADVANCED INORGANIC FIBRE COMPOSITES**  
**FOR STRUCTURAL AND THERMAL**  
**MANAGEMENT APPLICATIONS**

*Room: SPELLO*

*Chair: Mrityunjay SINGH, USA (Convener)*

**14.25 Welcome**

**Session CO-1 - Production and Properties of Reinforcements, Preforms, and Matrix Materials**

**14.30 CO-1:IL01 Oxide Ceramic Fibers - State of the Art and New Developments**

**B. CLAUSS**, S. PFEIFER, German Institutes of Textile and Fiber Research (DITF Denkendorf), Denkendorf, Germany; M.R. BUCHMEISER, DITF Denkendorf and University of Stuttgart, Institute of Polymer Chemistry, Stuttgart, Germany

**15.00 CO-1:IL02 High-performance SiC-polycrystalline Fiber**

**TOSHIHIRO ISHIKAWA**, Tokyo University of Science, Yamaguchi, Sanyo-Onoda, Yamaguchi, Japan

**15.30 CO-1:IL03 A Novel PAN/Silazane Hybrid Material for Processing of Carbon Fibers with Extraordinary Oxidation Resistance**

**G. MOTZ**, University of Bayreuth, Ceramic Materials Eng., Bayreuth, Germany; L. RIBEIRO, R.A.F. MACHADO, Federal University of Santa Catarina Materials Engineering, Florianopolis, Brazil

**16.00 Break**

*Chair: Toshihiro ISHIKAWA, Japan*

**16.30 CO-1:IL04 Structure and Properties of Carbon Fibers**

**H. PETERLIK**, University of Vienna, Faculty of Physics, Vienna, Austria

**17.00 CO-1:L05 High Temperature Potential of Oxide Ceramic Fibers Investigated by Mini-composites Approach**

**K. TUSHTEV**, R.S.M. ALMEIDA, K. REZWAN, Advanced Ceramics, University of Bremen, Bremen, Germany

**17.20 CO-1:L06 In-situ Formed h-BN Platelet Reinforced Boron Carbide Composites Sintered via SPS**

**FAN ZHANG**, ZHENGYI FU, WEIMIN WANG, State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, China

**17.40 CO-1:L07 An Original Way to Produce Carbon Reinforcements: Polyoxometalate - Reduced Graphene Oxide Nanocomposite**

**C. DEBIEMME-CHOUVY<sup>1</sup>**, B. THOMAS<sup>2</sup>, I. LUCAS<sup>1</sup>, M.M.T. TRAN<sup>1</sup>, A. VEILLERE<sup>2</sup>, J.-M. HEINTZ<sup>2</sup>, J.-F. SILVAIN<sup>2</sup>, <sup>1</sup>Laboratoire Interfaces et Systèmes Electrochimiques, LISÉ - UMR 8235, Sorbonne Universités, UPMC Univ Paris 06, CNRS, Paris, France; <sup>2</sup>Institut de Chimie de la Matière Condensée de Bordeaux, ICMCB-CNRS, Pessac Cedex, France

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## **WEDNESDAY JUNE 6 MORNING**

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*Room: ASSISI A*

### **Session CA-2 - Colloidal Processing**

*Chair: Mikolaj SZAFRAN, Poland*

- 9.00 CA-2:IL01 **Powder-Less Processing for Nano-structured Functional Ceramics: Realization of direct Fabrication from Solutions and/or Melts**  
**MASAHIRO YOSHIMURA**, Materials Sci. & Eng. National Cheng Kung University, Tainan, Taiwan & Tokyo Institute of Technology, Tokyo, Japan
- 9.30 CA-2:IL02 **Layer by Layer Modification of Nanoparticles Surfaces in Suspension: From Order to Chaos during the Nanostructured Growth of a Ceramic Film**  
**B. FERRARI**, Z. GONZALEZ, J. YUS, A.J. SANCHEZ-HERENCIA, Institute of Ceramics and Glass, CSIC, Tailoring through Colloidal Processing Group, Madrid, Spain
- 10.00 CA-2:IL03 **Role of Electrostatic Interactions in the Adsorption of Colloids in Pickering Emulsions**  
**M. CERBELAUD**, A. VIDEKOQ, A. AIMABLE; Univ. Limoges, CNRS, SPCTS, UMR 7315, Limoges, France; L. ALISON, H. TERVOORT, A. STUDART, Complex Materials, Department of Materials, ETH Zurich, Zurich, Switzerland
- 10.20 *Break*

### **Session CA-3 - Shape Forming and Green Body Processing and Characterization**

*Chair: Masahiro YOSHIMURA, Taiwan*

- 10.50 CA-3:IL01 **Aqueous Gelcasting: A Versatile and “Green” Technique to Shape Ceramics**  
**L. MONTANARO**, P. PALMERO, M. LOMBARDI, C. PETIT, J.-M. TULLIANI, Dept. Applied Science and Technology DISAT, Politecnico di Torino, Torino, Italy
- 11.20 CA-3:IL02 **Nano/Microstructure Control of Advanced Materials and their Applications by Smart Powder Processing**  
**MAKIO NAITO**, TAKAHIRO KOZAWA, AKIRA KONDO, Joining and Welding Research Institute (JWRI), Osaka University, Ibaraki, Japan
- 11.50 CA-3:IL03 **Environmentally Benign Debinding Procedures for Thermoplastic Based Ceramic Processing Route**  
L. GORJAN, T. LUSIOLA, D. SCHARF, **F. CLEMENS**, Empa, Materials Science and Technology, Lab. for High Performance Ceramics, Dübendorf, Switzerland
- 12.20 CA-3:IL04 **Preparation of TiO<sub>2</sub>-Y<sub>2</sub>O<sub>3</sub> and UO<sub>2</sub>-Y<sub>2</sub>O<sub>3</sub> Pellets by Freeze Granulation or Slip Casting**  
**F. LA LUMIA**, L. RAMOND, G. BERNARD-GRANGER, CEA Marcoule, Bagnols-sur-Cèze, France; C. PAGNOUX, SPCTS, Limoges, France
- 12.40 CA-3:IL05 **Tribochemically Induced Optical Property Changes in MgO-Nanoparticle Powders**  
**T. SCHWAB**, D. THOMELE, University of Salzburg, Salzburg, Austria; K. MCKENNA, University of York, York, UK; O. DIWALD, University of Salzburg, Salzburg, Austria

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## WEDNESDAY JUNE 6 MORNING

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Room: ASSISI B

### Session CB-2 - Polymer Derived Ceramics

Chair: Joerg SCHNEIDER, Germany

- 9.00 **CB-2:IL01 Polymer-derived High-pressure Phases via Intermediate Amorphous Materials**

**YOSHIYUKI SUGAHARA**, Department of Applied Chemistry, School of Advanced Science and Engineering, Waseda University, Tokyo, Japan; Kagami Memorial Research Institute for Materials Science and Technology, Waseda University, Tokyo, Japan

- 9.30 **CB-2:IL02 Polymer-derived Ceramic Nanocomposites for Applications at High Temperatures and in Harsh Environments**

**E. IONESCU**, Darmstadt University of Technology, Institute for Materials Science, Darmstadt, Germany

- 10.00 **CB-2:L03 Multiple Stages of Structure Formation in Silicon Oxycarbide Ceramics**

**P. KROLL**, The University of Texas at Arlington, Arlington, TX, USA

- 10.20 **CB-2:L04 Molecular Route Syntheses of Inorganic C-N Compounds in Ultra-high Pressure and Temperature**

**MASASHI HASEGAWA**, KEN NIWA, TOSHIFUMI FUKAI, YUKI JIN, Department of Materials Physics, Nagoya University, Nagoya, Japan

10.40 Break

Chair: Yoshiyuki SUGAHARA, Japan

- 11.10 **CB-2:L06 Synthesis of Fluorinated Polysilazanes and their Application as Protective Hydrophobic Coatings**

**P. FURTAT**, G. MOTZ, Department of Ceramic Materials Engineering, Bayreuth University, Bayreuth, Germany; R. MACHADO, Department of Chemical Engineering, Federal University of Santa Catarina, Florianopolis, Brazil

- 11.30 **CB-2:L07 Novel Glass-ceramics from Glass Powders and Reactive Preceramic Polymer Binders**

**H. ELSAYED<sup>1, 2</sup>**, E. BERNARDO<sup>1</sup>, <sup>1</sup>Department of Industrial Engineering, University of Padova, Italy; <sup>2</sup>Ceramics Department, National Research Centre, El-Bohous Street, Cairo, Egypt

- 11.50 **CB-2:L08 Generation and Control of Microporosity in Polymer-derived SiCN Ceramics**

**C. DRECHSEL**, T. KONEGGER, Institute of Chemical Technologies and Analytics, TU Wien, Vienna, Austria

- 12.10 **CB-2:L09 Molecular Design of Novel 0D, 1D and 2D Nanocarbon-based Ceramic Composites**

**G. MERA**, R. RIEDEL, TU Darmstadt, Institute for Materials Science, Darmstadt, Germany

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## **WEDNESDAY JUNE 6 MORNING**

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*Room:* **SALA STAMPA**

### **Session CB-8.1 - Self-assembly, Mineralization and Hierarchical Organization; Hybrid Structures**

*Chair:* Clement SANCHEZ, France

- 9.00 **CB-8.1:IL04 Chemical Transformation of Sustainable 3-D Microscale Biogenic Structures into High-Fidelity Replicas Comprised of Multicomponent Functional Synthetic Materials**  
**K.H. SANDHAGE**, School of Materials Engineering, Purdue University, West Lafayette, IN, USA
- 9.30 **CB-8.1:IL05 Designing Hierarchical Rare Earth Nanoceramics for Biomedical Applications**  
**S. SEAL**, Materials Science & Eng, Advanced Materials Processing Analysis Center, Nanoscience Technology Center, College of Medicine, University of Central Florida, Orlando, FL, USA
- 10.00 **CB-8.1:IL06 Nonclassical Crystallization in Vivo: A Fundamental Process-structure-property Relationship in Biominerals and New Synthesis Pathway to Bioinspired Nanoceramics and Gradient Materials**  
**S.E. WOLF**, Institute for Glass and Ceramics, Friedrich-Alexander-University Erlangen-Nürnberg, Erlangen, Germany
- 10.20 **CB-8.1:IL07 Bioprocess Inspired Synthesis of Functional Materials**  
**HAO XIE<sup>1,2</sup>**, Zheng-Yi FU<sup>1</sup>, <sup>1</sup>State Key Lab of Advanced Technology for Materials Synthesis and Processing; <sup>2</sup>School of Chemistry, Chemical Engineering, and Life Science, Wuhan University of Technology, Wuhan, China
- 10.40 *Break*

### **Session CB-8.2 - Structure and Mechanics of Bio-inspired Materials**

*Chair:* Kenneth SANDHAGE, USA

- 11.10 **CB-8.2:IL01 Strain-rate Dependent Deformation Mechanism of Bioinspired Graphene-Al Nanolaminated Composites**  
**QIANG GUO**, LEI ZHAO, ZAN LI, ZHIQIANG LI, GENLIAN FAN, DING-BANG XIONG, YISHI SU, DI ZHANG, State Key Lab of Metal Matrix Composites, Shanghai Jiao Tong University, Shanghai, China
- 11.40 **CB-8.2:IL02 High-throughput Bioengineering of Novel Nanostructures by Genetic Manufacturing on Insect Corneal Surfaces: Looking for Applications**  
**V. KATANAEV**, University of Lausanne, Lausanne, Switzerland
- 12.10 **CB-8.2:IL05 Impact Tolerant Biocomposites**  
**D. KISAILUS**, Materials Science and Engineering, and Department of Chemical and Environmental Engineering, University of California Riverside, CA, USA

**Focused Session CB-9  
ADDITIVE MANUFACTURING**

*Room:* **VIP**

*Chair:* Aldo R. BOCCACCINI, Germany (*Convener*)

**9.00 Welcome**

**Session CB-9.1 - Selective Laser Sintering**

- 9.05 **CB-9.1:IL01 How to Process Ceramics by Laser Beam Melting?**  
**E. JUSTE**, BCRC, Mons, Belgium
- 9.35 **CB-9.1:IL02 Powder-based Additive Manufacturing at Micro-gravity**  
**J. GUENSTER**, A. ZOCCA, P. LIMA, J. LÜCHTENBORG, Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany; T. MÜHLER, Clausthal University of Technology (TUC), Clausthal-Zellerfeld, Germany; M. SPARRENBERG, J. MELCHER, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Braunschweig, Germany
- 10.05 **CB-9.1:IL03 Laser Sintering of Ceramics**  
**TEIICHI KIMURA**, Japan Fine Ceramics Center, Nagoya, Japan
- 10.35 **CB-9.1:IL04 Alumina Refractory Ceramic Molds Processed by SLM**  
**D. DESCHUYTENEER**, Belgian Ceramic Research Centre, Mons, Belgium
- 11.05 **CB-9.1:IL05 Additive Manufacturing of Geopolymers by Local Laser Curing**  
**P. HLAVACEK<sup>1</sup>**, T. MUEHLER<sup>2</sup>, J. LUECHTENBORG<sup>1</sup>, P. STURM<sup>1</sup>, G.J.G. GLUTH<sup>1</sup>, H.-C. KUEHNE<sup>1</sup>, J. GUENSTER<sup>1,2</sup>, <sup>1</sup>Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany; <sup>2</sup>TU Clausthal, Clausthal-Zellerfeld, Germany

**11.25 Break**

*Chair:* Teiichi KIMURA, Japan

**Session CB-9.2 - Laminated Object Manufacturing**

- 11.45 **CB-9.2:IL01 Laminated Object Manufacturing of Ceramic-based Composites**  
**N. TRAVITZKY**, University of Erlangen-Nuremberg, Dept. of Materials Science, Glass and Ceramics, Erlangen, Germany
- 12.15 **CB-9.2:IL03 Additive Manufacturing of AlN Based UV-curable Dispersions**  
**P. OZOG<sup>1,2</sup>**, D. KATA<sup>2</sup>, T. GRAULE<sup>1</sup>, <sup>1</sup>Laboratory for High Performance Ceramics, Empa, Dübendorf, Switzerland; <sup>2</sup>Faculty of Materials Science and Ceramics, University of Science and Technology, Cracow, Poland

**Focused Session CB-10  
SHS CERAMICS**

*Room: SALA RELATORI*

*Chair: Alexander S. ROGACHEV, Russia (Convener)*

**9.00 Welcome**

**Session CB-10.2 - SHS of Powders from the Micro- to Nano-scale. Consolidation of the SHS-powders**

- 9.05 **CB-10.2:L01 Ultra-refractory Ceramics by Combination of SHS and SPS: Recent Advances**  
**R. ORRU'**, G. TALLARITA, R. LICHERI, G. CAO, Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università degli Studi di Cagliari, Cagliari, Italy
- 9.35 **CB-10.2:L02 Design, Combustion Synthesis and Consolidation of the Borides in Zr-Ta-B System**  
**V.V. KURBATKINA**, E.I. PATCERA, E.A. LEVASHOV, National University of Science and Technology "MISIS", Moscow, Russia
- 9.55 **CB-10.2:L03 NiO and WO<sub>3</sub> Coreduction by Combined Reducers Mg/C and Preparation of W-Ni Alloy**  
**M.K. ZAKARYAN**<sup>1, 2</sup>, S.V. AYDINYAN<sup>3</sup>, S.L. KHARATYAN<sup>1, 2</sup>, <sup>1</sup>A.B. Nalbandyan Institute of Chemical Physics NAS RA, Yerevan, Armenia; <sup>2</sup>Yerevan State University, Yerevan, Armenia; <sup>3</sup>Tallinn University of Technology, Tallinn, Estonia
- 10.15 **CB-10.2:L04 Mechanically Activated SHS in Ta-Si-C System**  
**S. VOROTILO**, E.A. LEVASHOV, National University of Science and Technology "MISiS", Moscow, Russia
- 10.35 *Break*

**Session CB-10.1 - Theory and Modeling of SHS Processes and Structural Transformations**

*Chair: Evgeny LEVASHOV, Russia*

- 11.05 **CB-10.1:L01 Concurrent and Complementary Methods in the Theory of SHS: Partial Differential Equations vs Molecular Dynamics**  
**F. BARAS**, Laboratoire ICB, CNRS-Université Bourgogne Franche-Comté, Dijon, France
- 11.35 **CB-10.1:L03 A Molecular Dynamics Simulation of SHS in Nanofoils**  
**O. POLITANO**, Laboratoire ICB UMR 6303 CNRS-Université de Bourgogne, Dijon Cedex, France
- 12.05 **CB-10.1:L04 Influence of Mechanical Activation on Micro-structure, Reactivity and Kinetic Parameters of SHS-mixtures**  
**A.S. ROGACHEV**, Merzhanov Institute of Structural Macrokinetics and Materials Science (ISMAN), Chernogolovka Moscow region, Russia

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## WEDNESDAY JUNE 6 MORNING

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Room: MONTEFALCO

### Session CC-1 - Friction and Wear

Chair: Paul MAYRHOFER, Austria

- 9.00 CC-1:L07 **Composite Solid Lubricants for Use in Extreme Environments**  
**M.T. DUGGER**, Sandia National Labs, Albuquerque, NM, USA
- 9.30 CC-1:L08 **Diamond, cBN Reinforced Ceramic Materials: Potential Wear Resistant Components**  
**M. HERRMANN**, B. MATTHEY, S. KUNZE, A.-K. WOLFRUM, Fraunhofer-IKTS, Dresden, Germany
- 10.00 CC-1:L09 **On Silicon-based Ceramics for Utilization in High Pressure Pumps for Gasoline Direct Injection and the Effects of Laser Surface Texturing**  
**P. SCHREIBER**, J. SCHNEIDER, Karlsruhe Institute of Technology IAM-CMS, Karlsruhe, BW, Germany; P. ZIELONKA, K.G. SCHELL, E.C. BUCHARSKY, M.J. HOFFMANN, Karlsruhe Institute of Technology IAM-KWT, Karlsruhe, BW, Germany
- 10.20 CC-1:L11 **Mechanical Properties and Wear Behaviour of Boron Carbide/Graphene Platelet Ceramics**  
R. SEDLAK<sup>1</sup>, **A. KOVALCIKOVA**<sup>1</sup>, J. BALKO<sup>1</sup>, P. RUTKOWSKI<sup>2</sup>, A. DUBIEL<sup>2</sup>, E. MUDRA<sup>1</sup>, V. GIRMAN<sup>3,1</sup>, J. DUSZA<sup>1</sup>, <sup>1</sup>Institute of Materials Research, SAS, Kosice, Slovak Rep.; <sup>2</sup>AGH University of Science and Technology in Krakow, Dept. of Ceramics and Refractories, Krakow, Poland; <sup>3</sup>Pavol Jozef Safarik University in Kosice, Dept. of Condensed Matter Physics, Kosice, Slovak Rep.
- 10.40 Break

Chair: Michael DUGGER, USA

- 11.10 CC-1:L12 **In Situ Generated Turbostratic 2D Graphite: A New Family of Self Lubricating Composites**  
**J.D. BIASOLI DE MELLO**<sup>1</sup>, C. BINDER<sup>1</sup>, R BINDER<sup>2</sup>, A.N. KLEIN<sup>1</sup>, <sup>1</sup>Federal University of Santa Catarina, EMC, Florianópolis, SC, Brazil; <sup>2</sup>Whirphool / Embraco, Joinville, SC, Brazil; <sup>3</sup>Federal University of Uberlandia, Uberlandia, MG, Brazil
- 11.40 CC-1:L13 **Tribochemistry and Environmental Effects in Friction of Amorphous Carbon Films**  
**F. MANGOLINI**, Dept. of Mechanical Eng., The University of Texas at Austin, Austin, TX, USA; K.D. KOSHIGAN, J. FONTAINE, Lab. de Tribologie et Dynamique des Systèmes, Ecole Centrale de Lyon, Ecully cedex, France; M.H. VAN BENTHEM, J.A. OHLHAUSEN, Sandia National Labs, Albuquerque, NM, USA; J.B. McCLIMON, Dept. of Materials Science and Eng., University of Pennsylvania, Philadelphia, PA, USA; J. HILBERT, R.W. CARPICK, Dept. of Mechanical Eng. and Applied Mechanics, University of Pennsylvania, Philadelphia, PA, USA
- 12.10 CC-1:L14 **Machining of Ceramic Matrix Composites**  
**R. GOLLER**, A. ROESIGER, Augsburg University of Applied Sciences, Augsburg, Germany

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## **WEDNESDAY JUNE 6 MORNING**

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*Room: MAGIONE B*

### **Session CE-1 - Innovative Processing of Nano- and Heterostructures and Films of Functional Materials**

*Chair: Andre TEN ELSHOF, The Netherlands*

- 9.00 **CE-1:IL07 Flexibility of Core-shell Nanostructures for Clean Energy Work**  
**D. HC CHUA**, National University of Singapore, Singapore
- 9.30 **CE-1:IL08 Recent Advances in the MOVPE Growth and Nano-Scale Characterization of III-V Nanowires for Photonics and Photovoltaics**  
**N. LOVERGINE**, Università del Salento, Lecce, Italy; P. PRETE, IMM-CNR, Lecce, Italy
- 10.00 **CE-1:L09 Particle Sintering and Buildup of Solid-electrolyte Interfaces in APorous TiO<sub>2</sub> Nanocrystal Electrodes**  
K. RETTENMAIER, J. MIGUEL JIMÉNEZ, **T. BERGER**, Department of Chemistry and Physics of Materials, University of Salzburg, Salzburg, Austria

10.20 *Break*

*Chair: Nicola LOVERGINE, Italy*

- 10.50 **CE-1:IL10 Low Temperature Growth of Graphene with In-situ TEM Observations**  
**MASAKI TANEMURA<sup>1</sup>**, M.I. ARABY<sup>1</sup>, R. VISHWAKARMA<sup>1</sup>, M.S. ROSMI<sup>2</sup>, S. SHARMA<sup>1</sup>, Y. WAKAMATSU<sup>1</sup>, K. TAKAHASHI<sup>1</sup>, G. KALITA<sup>1</sup>, M. KITAZAWA<sup>3</sup>, Y. YAAKOB<sup>4</sup>, M.Z.M. YUSOP<sup>5</sup>, <sup>1</sup>Dept. of Frontier Materials, Nagoya Inst. of Tech., Showa-ku, Nagoya, Japan; <sup>2</sup>Dept. of Chemistry, Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, Tanjung Malim, Perak, Malaysia; <sup>3</sup>Olympus Co. Ltd., Nagano, Japan; <sup>4</sup>Dept. of Physics, Univ. Putra Malaysia, UPM Serdang, Selangor, Malaysia; <sup>5</sup>Dept. of Materials, Univ. Tech. Malaysia, Skudai, Johor, Malaysia
- 11.20 **CE-1:L11 Hybrid Down-converting Nano-structures for Solid State Lighting**  
**H. MENKARA**, PhosphorTech, Kennesaw, GA, USA
- 11.40 **CE-1:IL12 Novel Routes to Non-oxide Metal-containing Nanoparticles (phosphides, carbides, oxysulfides)**  
**S. CARENCO**, Sorbonne Universités, UPMC Univ Paris 06, CNRS, Collège de France, Lab. de Chimie de la Matière Condensée de Paris, Paris, France

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## **WEDNESDAY JUNE 6 MORNING**

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*Room: ORVIETO A*

### **Session CF-1 - Synthesis and Processing**

*Chair: Jon BINNER, UK*

- 9.00 **CF-1:L07 Sintering of Ultra-high Temperature, High Entropy Ceramics based on Multi-component Metal Carbides**  
E.G. CASTLE, **M.J. REECE**, School of Engineering and Material Science, Queen Mary University of London, London, UK
- 9.30 **CF-1:L08 Developing Cost-effective Manufacturing Methods and Processing Strategies for UHTCs**  
**C. TALLON**, Dept. of Materials Science and Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA
- 10.00 **CF-1:L09 Target Materials for the Production of Radioisotopes at the SPES Facility**  
**S. CORRADETTI**, A. ANDRIGHETTO, M. BALLAN, F. BORGNA, M. MANZOLARO, INFN - Lab. Nazionali di Legnaro, Legnaro, Italy; S. CARTURAN, Università di Padova, Dip. Fisica e Astronomia, Padova, Italy; L. BIASETTO, Università di Padova, Dip. Tecnica e Gestione dei Sistemi Industriali, Vicenza, Italy; G. FRANCHIN, P. COLOMBO, Università di Padova, Dip. Ingegneria Industriale, Padova, Italy

10.20 *Break*

*Chair: Diletta SCITI, Italy*

- 10.50 **CF-1:L11 Additive Manufacturing of Hard Transparent Ceramics**  
**A.E.M. BROWAR**, G. GUSS, J.D. KUNTZ, M.J. MATTHEWS, N. SHEN, R.M. PANAS, C.M. SPADACCINI, Lawrence Livermore National Laboratory, Livermore, CA, USA; J.D. ELLIS, University of Rochester, Rochester, NY, USA

### **Session CF-2 - Corrosion, Oxidation, and Testing**

- 11.10 **CF-2:L02 Development of Environmental Barrier Coatings for Non-oxide Ceramic Matrix Composites**  
**H. KLEMM**, W. KUNZ, B. GRONDE, K. SCHÖNFELD, FhG IKTS Dresden, Dresden, Germany

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## WEDNESDAY JUNE 6 MORNING

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Room: **ORVIETO B**

### **Session CG-2 - New MAX/MAB/MXenes**

Chair: Jozef VLEUGELS, Belgium

- 9.00 CG-2:IL03 **Magnetic MAX-phases: The Ultimate Material Class for Innovations in Spin-based Technologies ?**  
M. FARLE, **R. SALIKHOV**, U. WIEDWALD, Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany
- 9.30 CG-2:IL04 **Novel MXene Materials and their Properties**  
JIE ZHOU, MIAN LI, XIAOJING BAI, XIANHU ZHA, SHIYU DU, **QING HUANG**, Ningbo Inst. of Industrial Technology, CAS, Ningbo, China
- 10.00 CG-2:IL05 **Compatibility of Zr<sub>2</sub>AIC, (Zr,Ti)2AIC and (Zr,Ti)3AIC<sub>2</sub> MAX Phases with Lead-Bismuth Eutectic (LBE)**  
**B. TUNCA**<sup>1, 2</sup>, T. LAPAUW<sup>1, 2</sup>, K.G. PRADEEP<sup>3</sup>, J. SCHNEIDER<sup>3</sup>, R. DELVILLE<sup>1</sup>, J. HADERMANN<sup>4</sup>, J. VLEUGELS<sup>2</sup>, K. LAMBRINOU<sup>1</sup>, <sup>1</sup>Belgian Nuclear Research Centre, SCK•CEN, Mol, Belgium; <sup>2</sup>Dept. of Materials Engineering, KU Leuven, Heverlee, Belgium; <sup>3</sup>Materials Chemistry, RWTH Aachen University, Aachen, Germany; <sup>4</sup>Dept. of Physics, University of Antwerp, Antwerp, Belgium
- 10.20 CG-2:IL06 **New MAX Phases and MXenes for Energy Relevant Applications**  
M.H. TRAN, **C.S. BIRKEL**, Technische Universität Darmstadt, Darmstadt, Germany
- 10.40 Break

### **Session CG-3 - Mechanical Properties and Oxidation of MAX/MAB/MXenes**

Chair: Johanna ROSEN, Sweden

- 11.00 CG-3:IL01 **Ripplocations: A Universal Mechanism in the Deformation of Layered Solids**  
**M.W. BARSOUM**, Drexel University, Philadelphia, PA, USA
- 11.30 CG-3:IL02 **Self-healing Properties of MAX-phases: Thermo-dynamic Predictions and Reality**  
**S. VAN DER ZWAAG**, W.G. SLOOF, Delft University of Technology, Delft, The Netherlands
- 12.00 CG-3:IL03 **Oxidation, Thermal Stability, and Mechanical Deformation of the Alumina-forming Nanolaminated Boride: MoAlB**  
**S. KOTA**, A. LY, O. ELKASSABANY, A. HUON, S.J. MAY, M.W. BARSOUM, Dept. of Matls Science & Eng., Drexel University, Philadelphia, PA, USA; E. ZAPATA-SOLVAS, W.E. LEE, Centre for Nuclear Eng. & Dept. of Matls, Imperial College London, UK; YEXIAO CHEN, D. LOPEZ, M. RADOVIC, Dept. of Matls Science & Eng., Texas A&M University, College Station, TX, USA; JUN LU, L. HULTMAN, Linköping University, Dept. of Physics (IFM), Sweden; B. GARDIOLA, O. DEZELLUS, Université Claude Bernard LYON1, Lab. des Multimatériaux et Interfaces, UMR CNRS 5615, Villeurbanne, France
- 12.30 CG-3:IL04 **MAX Phase High-temperature Plasticity: Nano-indentation and Transmission Electron Microscopy Analysis of Dislocations Elementary Mechanisms**  
W. SYLVAIN, **A. JOULAIN**, C. TROMAS, L. THILLY, Pprime Institute, CNRS, University of Poitiers, ISAE-ENSMA, France; S. SCHROEDERS, C. ZEHNDER, S. KORTE, C. IMM- RWTH Aachen University, Germany; G. RENOU, SIMAP, Grenoble, France

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## **WEDNESDAY JUNE 6 MORNING**

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*Room:* **SPOLETO B**

### **Session CH-2 - High Temperature Protective Coatings in Oxidising and Harsh Environments**

*Chair:* Bertrand JODOIN, Canada

- 9.00 **CH-2:L01 Environmental Barrier Coatings for All-oxide Ceramic Matrix Composite Combustor Liners**  
**P. MECHNICH**, German Aerospace Center (DLR) Institute of Materials Research, Koeln, Germany
- 9.30 **CH-2:L02 Materials for Very High Temperature Solar Receivers**  
**J. COLAS**, L. CHARPENTIER, M. BALAT PICHELIN, PROMES-CNRS, Font-Romeu Odeillo, France; M. PONS, F. MERCIER, D. CHEN, SIMaP, St-Martin-d'Hères cedex, France; D. PIQUE, SIL'TRONIX ST, Archamps, France
- 9.50 **CH-2:L03 Superior High-temperature Behavior of Amorphous Coatings from Quinary Hf-B-Si-C-N System**  
**P. ZEMAN**, S. ZUZJAKOVA, R. CERSTVY, J. VLCEK, Department of Physics and NTIS - European Centre of Excellence, University of West Bohemia, Plzen, Czech Republic
- 10.10 *Break*

### **Session CH-3 - Thermal Barrier Coatings**

*Chair:* Peter MECHNICH, Germany

- 10.40 **CH-3:L01 Present and Future of Thermal Barrier Coatings**  
R. VASSEN<sup>1</sup>, **D.E. MACK**<sup>1</sup>, O. GUILLO<sup>1, 2</sup>, <sup>1</sup>Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Materials Synthesis and Processing (IEK-1), Jülich, Germany; <sup>2</sup>Jülich Aachen Research Alliance: JARA-Energy
- 11.10 **CH-3:L02 Microstructural Evolution and Thermal Barrier Performance of Plasma-sprayed YSZ Coatings**  
**KYEONG-HO BAIK**, HEE-JIN PARK, SANG-WOON KANG, Department of Materials Science and Engineering, Chungnam National University, Yuseong, Daejeon, South Korea
- 11.40 **CH-3:L03 Thermal Spray as an Additive/Layered Manufacturing Technology for Energy Related Applications**  
**S. SAMPATH**, Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY, USA
- 12.10 **CH-3:L04 Degradation of Zirconates and Novel Air-plasma-sprayed LaYbZr2O7 Thermal Barrier Coatings by Environmental Molten Salt and CMAS (CaO–MgO–Al2O3–SiO2)**  
**MIN WANG**, XINCHUN LAI; JUN YANG, SICONG GUO, ZIYUAN WANG, WEI PAN, Institute of Materials, China Academy of Engineering Physics; State Key Laboratory of New Ceramics and Fine Processing, Tsinghua University, China
- 12.30 **CH-3:L05 Corrosive and Mechanical Properties of ZrO2 Thermal Barrier Coatings by Thermal Exposure**  
**BYUNG-KOOG JANG**<sup>1</sup>, KOUICHI YASUDA<sup>2</sup>, SEONGWON KIM<sup>3</sup>, YOON-SUK OH<sup>3</sup>, HYUNG-TAE KIM<sup>3</sup>, <sup>1</sup>Interdisciplinary Graduate School of Eng. Sciences, Kyushu University, Kasuga-shi, Fukuoka, Japan; <sup>2</sup>Dept. of Materials Science and Engineering, Tokyo Institute of Technology, Tokyo, Japan; <sup>3</sup>Eng. Ceramic Center, Korea Institute of Ceramic Eng. and Technology, Icheon, South Korea

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## **WEDNESDAY JUNE 6 MORNING**

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*Room: MAGIONE A*

### **Session CI-1 - Novel Synthesis and Processing**

*Chair:* Kazuki NAKANISHI, Japan

- 9.30 **CI-1:L08 Uniformly Porous Ceramics with 3-D Network Structure (UPC-3D) Prepared by Pyrolytic Reactive Sintering**  
**YOSHIKAZU SUZUKI**, Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki, Japan
- 10.00 **CI-1:L10 Porous Glass-ceramics from Alkali Activation and Sinter-crystallization of Waste Glass Mixtures**  
**P. RABELO MONICH<sup>1</sup>**, A. RINCON ROMERO<sup>1</sup>, D. HÖLLEN<sup>2</sup>, E. BERNARDO<sup>1</sup>, <sup>1</sup>Dipartimento di Ingegneria Industriale, Università degli Studi di Padova, Padova, Italy; <sup>2</sup>Chair of Waste Processing Technology and Waste Management, Montanuniversität Leoben, Leoben, Austria
- 10.20 **CI-1:L12 Glass Ceramic Foams from Vitrified Wastes Produced by Inorganic Gel Casting and Sinter-crystallization**  
**A. RINCON**, E. BERNARDO, Department of Industrial Engineering, University of Padova, Padova, Italy; M. SALVO, Department of Applied Science and Technology, DISAT, Politecnico di Torino, Torino, Italy
- 10.40 *Break*

*Chair:* Enrico BERNARDO, Italy

- 11.10 **CI-1:L13 From Micro to Ultra-Macro Porosity in Alkali Bonded Ceramics (Geopolymers)**  
**E. PAPA**, A. NATALI MURRI, E. LANDI, V. MEDRI, CNR-ISTEC, Faenza, Italy
- 11.40 **CI-1:L14 Processing and Application of Porous TiC-Carbon Nanocomposites for Radioactive Ion Beam Production at CERN-ISOLDE**  
J.P. RAMOS, T. STORA, CERN, Geneva, Switzerland; A.M.R. SENOS, C.M. FERNANDES, CICECO, Aveiro, Portugal; **P. BOWEN**, EPFL, Switzerland
- 12.00 **CI-1:L15 High Content SiO<sub>2</sub> Porous Glass Ceramics for High Temperature Applications and their Properties**  
**L. ORTMANN**, F.P. LUDWIG, U. HEIZE, QSIL GmbH Quarzglasschmelze Ilmenau, Langewiesen, Germany; H. RICHTER, IKTS Hermsdorf, Germany

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## WEDNESDAY JUNE 6 MORNING

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Room: **SPOLETO A**

### **Session CJ-2 - Ferroelectric, Piezoelectric, Pyroelectric, and Ferroelastic Ceramics**

Chair: Oswaldo DIEGUEZ, Israel

- 9.30 **CJ-2:IL05 Nanoscale Susceptibilities in Ferroelectric Thin Films: Insights from Multidimensional Spectroscopy and Machine Learning**  
L. MARTIN, **J. AGAR**, University of California at Berkeley, USA
- 10.00 **CJ-2:IL09 Iron's Valence Control of BiFeO<sub>3</sub>-based Piezoelectric Ceramics for Property Enhancement**  
**SATOSHI WADA**<sup>1</sup>, T. AIZAWA<sup>1</sup>, S. UENO<sup>1</sup>, I. FUJII<sup>1</sup>, N. KUMADA<sup>1</sup>, C. MORIYOSHI<sup>2</sup>, Y. KUROIWA<sup>2</sup>, <sup>1</sup>Material Science and Technology, University of Yamanashi, Yamanashi, Japan; <sup>2</sup>Department of Physical Science, Hiroshima University, Hiroshima, Japan

10.30 *Break*

Chair: Satoshi WADA, Japan

- 11.00 **CJ-2:IL10 Deposition of Epitaxial and Composite Ferroelectrics Directly on Silicon**  
**C. DUBOURDIEU**, Helmholtz Zentrum Berlin für Materialien und Energie, Berlin, Germany; L. MAZET, Institut des Nanotechnologies de Lyon, CNRS, ECL, Ecully, France; M.M. FRANK, E. CARTIER, J. BRULEY, V. NARAYANAN, IBM T.J. Watson Research Center, Yorktown Heights, NY, USA; S.M. YANG, Department of Physics, Sookmyung Women's University, Seoul, South Korea; R.K. VASUDEVAN, S.V. KALININ, CNMS, Oak Ridge National Laboratory, Oak Ridge, TN, USA; C. MAGEN, LMA-INA, Universidad de Zaragoza, Zaragoza, Spain; S. SCHAMM-CHARDON, CEMES-CNRS, Université de Toulouse, Toulouse, France
- 11.30 **CJ-2:L11 Accurate Determination of Material Coefficients from Electromechanical Resonances of Lead-free Ba<sub>1-x</sub>CaxTi<sub>0.9</sub>Zr<sub>0.1</sub>O<sub>3</sub> (x=0.10-0.18) Mixed Oxide Ceramics**  
A. REYES<sup>1</sup>, M.E. VILLAFUERTE-CASTREJÓN<sup>1</sup>, A. GARCÍA<sup>2</sup>, A.M. GONZALEZ<sup>3</sup>, **L. PARDO**<sup>2</sup>, <sup>1</sup>Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, D.F. Mexico; <sup>2</sup>Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Cantoblanco, Madrid, Spain; <sup>3</sup>CEMDATIC, ETSIS, Campus Sur, Universidad Politécnica de Madrid, Madrid, Spain
- 11.50 **CJ-2:L12 Polarization in Ferroelectric Tungsten Bronzes**  
G.H. OLSEN, S. STUBMO AAMLID, S.M. SELBACH, **T. GRANDE**, Department of Materials Science and Engineering, NTNU Norwegian University of Science and Technology, Trondheim, Norway

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## **WEDNESDAY JUNE 6 MORNING**

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*Room:* **CORCIANO**

### **Session CK-1 - Magnetic Oxide Thin Films Interfaces and Heterostructures**

*Chair:* Gertjan KOSTER, The Netherlands

- 9.30 **CK-1:IL03 Domain Wall Conduction at All-in-all-out Antiferromagnetic Iridate Heterointerface**  
**MASAKI UCHIDA**, University of Tokyo, Tokyo, Japan
- 10.00 **CK-1:IL04 Complex Magnetic Order in Rare-earth Nickel Oxide Multilayers**  
**E. BENCKISER**, Max Planck Institute for Solid State Research, Stuttgart, Germany
- 10.30 *Break*

*Chair:* Eva BENCKISER, Germany

- 11.00 **CK-1:IL05 Carrier Density Controlled Topological Hall Effect in EuTiO<sub>3</sub> Films**  
K. AHADI, **S. STEMMER**, Materials Department, University of California, Santa Barbara, CA, USA
- 11.30 **CK-1:L06 Giant Topological Hall Effect from Magnetic Skyrmion Bubbles in Correlated Manganite Thin Films**  
**L. VISTOLI**, A. SANDER, QIUXIANG ZHU, S.E FUSIL, A. BARTHELEMY, V. GARCIA, M. BIBES, Unité Mixte de Physique CNRS/Thales, Université Paris-Sud, Université Paris-Saclay, Palaiseau, France; WENBO WANG, WEIDA WU, Rutgers Center for Emergent Materials and Department of Physics and Astronomy, Rutgers University, Piscataway, NJ, USA; B. CASALS, R. CICHELERO, G. HERRANZ, Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus de la UAB, Bellaterra, Catalonia, Spain

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## WEDNESDAY JUNE 6 MORNING

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Room: NORCIA

### **Session CL-2 - Luminescent and Chromogenic Ceramics and Glass Systems**

Chair: Oleg KHASANOV, Russia

**9.30 CL-2:IL01 Ceramic Phosphor Development for Solid State Lighting (SSL)**

**I. KINSKI**, M. ARNOLD, Fraunhofer Institute for Ceramic Technologies and Systems, Hermsdorf, Germany; M. FRIES, U. PARTSCH, Fraunhofer Institute for Ceramic Technologies and Systems, Dresden, Germany

**10.00 CL-2:IL02 Rare-earth-doped Glass and Glass-ceramic Phosphors for Radiation Imaging and Dosimetry**

**GO OKADA**<sup>1</sup>, F. CHICILLO<sup>2</sup>, JUMPEI UEDA<sup>3</sup>, S. TANABE<sup>3</sup>, A. EDGAR<sup>4</sup>, G. BELEV<sup>2</sup>, T. WYSOKINSKI<sup>5</sup>, D. CHAPMAN<sup>2</sup>, T. YANAGIDA<sup>1</sup>, S. KASAP<sup>2</sup>, <sup>1</sup>Nara Institute of Science and Technology, Nara, Japan; <sup>2</sup>University of Saskatchewan, Canada; <sup>3</sup>Kyoto University, Japan; <sup>4</sup>Victoria University of Wellington, New Zealand; <sup>5</sup>Canadian Light Source, Canada

**10.30 CL-2:IL03 GGAG Nanoceramics Doped with Rare Earth for Application in LED Lighting**

**P. GLUCHOWSKI**, W. STREK, W. RYBA-ROMANOWSKI, P. SOLARZ, Institute of Low Temperature and Structure Research PAS, Wrocław, Poland

**11.00 Break**

Chair: Go OKADA, Japan

**11.30 CL-2:IL04 Optical, Luminescent and Mechanical Properties of SPsed Ceramics Based on YSZ and MgAl<sub>2</sub>O<sub>4</sub>**

E.S. DVILIS, **O.L. KHASANOV**, E.F. POLISADOVA, V.D. PAYGIN, Tomsk Polytechnic University, Tomsk, Russia

**12.00 CL-2:IL05 Theoretical Modeling of Optical Properties of Red Phosphors for White LEDs**

**M.G. BRIK**, College of Sciences, Chongqing University of Posts and Telecommunications, Chongqing, P.R. China; Institute of Physics, University of Tartu, Tartu, Estonia; Institute of Physics, Jan Dlugosz University, Czestochowa, Poland

**12.30 CL-2:L06 Morfological, Photoluminescent and Structural Properties Study of Pr<sup>3+</sup>-Doped  $\alpha$ -Ag<sub>2</sub>WO<sub>4</sub> Synthesized by the Coprecipitation Methodology**

**I.L.V. ROSA**<sup>1</sup>, C.L. CORREA<sup>1</sup>, I.M. PINATTI<sup>1</sup>, R. ROMANCINI<sup>1</sup>, E. LONGO<sup>1,2</sup>, <sup>1</sup>CDMF, LIEC, Chem. Depart., Federal University of São Carlos (UFSCar), São Carlos, Brazil; <sup>2</sup>CDMF, LIEC, São Paulo State University (UNESP), Araraquara, Brazil

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## **WEDNESDAY JUNE 6 MORNING**

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*Room: CASCIA*

### **Session CM-1 - Smart Silicate Ceramics**

*Chair: Ferhat KARA, Turkey*

- 9.30 **CM-1:L04 Effect of Firing Temperature on the Photocatalytic Activity of Ceramic Glazes**  
M. SCARPATO, **A.M. BERNARDIN**, Ceramic Materials Group, UNESC, Criciúma, Santa Catarina, Brazil
- 10.00 **CM-1:L05 Development and Characterization of Multifunctional Coatings: Scratch Resistant Superhydrophobic Surfaces**  
**R. TAURINO**, F. BONDIOLI, Dipartimento di Ingegneria e Architettura, Università di Parma, Parma, Italy; M. MESSORI, M. CANNIO, Dipartimento di Ingegneria Enzo Ferrari, Università di Modena e Reggio Emilia, Modena, Italy; D.R. BOCCACCINI, G. MORINI, Tecnoitalia, Sassuolo, Italy
- 10.30 **CM-1:L06 Transparent Titania-based Thin Films with Silicate Binder for Self-cleaning and Photocatalytic Applications**  
**U. LAVRENVIC STANGAR**<sup>1, 2</sup>, N. VODIŠEK<sup>2</sup>, A. ŠULIGOJ<sup>1</sup>.  
<sup>3</sup><sup>1</sup>University of Ljubljana, Faculty of Chemistry and Chemical Technology, Ljubljana, Slovenia; <sup>2</sup>University of Nova Gorica, Nova Gorica, Slovenia; <sup>3</sup>National Institute of Chemistry, Ljubljana, Slovenia
- 11.00 **CM-1:L07 Eco-friendly Self-cooling System of Porous Silicate Plates by Evaporation of Absorbed Water**  
**HIROAKI KATSUKI**, EUN-KYOUNG CHOI, WON-JUN LEE, UNG-SOO KIM, KWANG-TAEK HWANG, WOO-SEOK CHO, SRIDHAR KOMARNENI, Korea Institute of Ceramic Engineering & Technology; The Pennsylvania State University, USA

11.20 *Break*

### **Session CM-2 - Green Silicate Ceramics**

*Chair: Elisa RAMBALDI, Italy*

- 11.50 **CM-2:L04 Waste Recycling in Clay Bricks**  
**C.M.F. VIEIRA**<sup>1</sup>, L. FONSECA AMARAL<sup>1</sup>, S.N. MONTEIRO<sup>2</sup>, <sup>1</sup>State University of the Northern Rio de Janeiro, UENF, Advanced Materials Laboratory, LAMAV, Campos dos Goytacazes, RJ, Brazil; <sup>2</sup>Military Institute of Engineering, IME, Department of Materials Science, Praia Vermelha, Urca, RJ, Rio de Janeiro, RJ, Brazil
- 12.20 **CM-2:L05 Technical Feasibility of Using Electric Arc Furnace Slag in Manufacturing of Bricks**  
**A.A. GUZMAN**, N.C. TORRES, Escuela Colombiana de Ingeniería Julio Garavito, Bogotá, Colombia

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## WEDNESDAY JUNE 6 MORNING

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Room: BEVAGNA

### Session CN-2 - Product Testing and Quality Control

Chair: Eric BLOND, France

- 9.00 CN-2:IL01 **Metastability, Energy Landscapes, and the Search for New Refractory Materials**  
A. NAVROTSKY, University of California, Davis, CA, USA
- 9.30 CN-2:IL02 **New Approach of Corrosion Kinetics: High-temperature Time-resolved Raman and XRD Techniques and Applications**  
E. DE BILBAO<sup>1</sup>, M. DOMBROWSKI<sup>1</sup>, R. MICHEL<sup>1</sup>, M. RAMZI AMMAR<sup>1</sup>, A. CAZINARES<sup>1</sup>, H. PILLIERE<sup>2</sup>, P. SIMON<sup>1</sup>, J. POIRIER<sup>1</sup>, <sup>1</sup>CEMHTI CNRS Univ. Orleans, Orleans, France; <sup>2</sup>Thermo Fisher Scientific Inel, France
- 10.00 CN-2:L03 **Three Stage Creep Behavior of MgO Containing Ordinary Refractories in Tension and Compression**  
S. SCHACHNER, S. JIN, H. HARMUTH, D. GRUBER, Montanuniversitaet Leoben, Austria
- 10.20 CN-2:L04 **Laser Induced Thermal Cycling and Hot Thermal Shock on Refractories Using TOM\_wave**  
H. FRIEDRICH, J. BABER, F. RAETHER, Fraunhofer Institute Silicate Research ISC, Fraunhofer-Center for High Temperature Materials and Design HTL, Bayreuth, Germany
- 10.40 CN-2:L05 **Analysis of the Fracture Behaviour of Magnesia-spinel Refractories by Digital Image Correlation**  
I. KHLIFI, M. HUGER, IRCER, Univ. de Limoges, UMR CNRS 7315, CEC, Limoges, France; O. POP, GEMH, Univ. de Limoges, Egletons, France; J.-C. DUPRÉ, P DOUMALIN, Institut Pprime, Univ. de Poitiers, UPR CNRS 3346, Futuroscope Chasseneuil, France
- 11.00 Break

### Session CN-4 - Modelling and Simulation of the Process Environment

Chair: Alexandra NAVROTSKY, USA

- 11.30 CN-4:IL01 **Application of Testing and Simulation for Fracture Mechanical Refractory Characterization**  
H. HARMUTH<sup>1</sup>, Y. DAI<sup>2</sup>, D. GRUBER<sup>1</sup>, SHENGLI JIN<sup>1</sup>, <sup>1</sup>Montanuniversitaet Leoben, Leoben, Austria; <sup>2</sup>Wuhan University of Science and Technology, Wuhan, China
- 12.00 CN-4:IL02 **Thermo-chemo-mechanical Modelling of Refractories at High Temperatures: Basics, Keypoints and New Numerical Developments**  
E. BLOND<sup>1</sup>, A.K. NGUYEN<sup>1,2</sup>, T. SAYET<sup>1</sup>, E. DE BILBAO<sup>3</sup>, A. BATAKIS<sup>2</sup>, M.-D. DUONG<sup>4</sup>, <sup>1</sup>Univ. d'Orléans, LaMé, Polytech Orléans, Orléans, France; <sup>2</sup>Univ. d'Orléans, MAPMO, UMR CNRS 6628, Orléans, France; <sup>3</sup>Univ. d'Orléans, CEMHTI, UPR CNRS 3079, Orléans, France; <sup>4</sup>Univ. of Science, Hochiminh city, Nguyen Van Cu, Vietnam
- 12.30 CN-4:L03 **Numerical Modelling by Discrete Element Method of Nonlinear Mechanical Behaviour of Refractories: Influence of Damage Involved by CTE Mismatch**  
T.T. NGUYEN, D. ANDRE, N. TESSIER-DOYEN, M. HUGER, University of Limoges, UMR CNRS 7315 - IRCER, Centre Européen de la Céramique, Limoges, France

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## **WEDNESDAY JUNE 6 MORNING**

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*Room:* SPELLO

### **Session CO-1 - Production and Properties of Reinforcements, Preforms, and Matrix Materials**

*Chair:* Bernd CLAUSS, Germany

- 9.00 CO-1:L08 **Development of Non-oxide Ceramic Fibers**  
**A. NOETH**, A. RÜDINGER, Fraunhofer Center for High Temperature Materials and Design HTL, Bayreuth, Germany; M. ROTHMANN, Werner Humbs, BJS Ceramics GmbH, Germany
- 9.30 CO-1:L09 **Production and Properties of High-temperature Resistant SiC Fiber and its Composites**  
**JUN WANG**, HAO WANG, YANZI GOU, Science and Technology on Advanced Ceramic Fibers and Composites Laboratory, National University of Defense Technology, Changsha, P.R. China
- 10.00 CO-1:L10 **Manufacturing Condition using the MI-PIP Hybrid Technique to Make a High Thermal Conductive SiC Fiber-Reinforced SiC Matrix Composite**  
**KOHEI EJIRI**, Tokyo University of Science, Noda-shi, Chiba, Japan; M. KOTANI, Japan Aerospace Exploration Agency, Mitaka-shi, Tokyo, Japan; S. OGIHARA, Tokyo University of Science, Noda-shi, Chiba, Japan
- 10.20 CO-1:L11 **Development of a Colloidal SiC-C-slurry for the Manufacturing of SiC/SiC Composites**  
**A. HELD**, S. KNOHL, W. KRENKEL, Department of Ceramic Materials Engineering, University of Bayreuth, Bavaria, Germany
- 10.40 CO-1:L12 **Preceramic Prepreg Production and use to produce low cost CMCs**  
**C. MINGAZZINI**, F. MAZZANTI, M. SCAFE' et al., ENEA-TEMAF, Faenza, Italy
- 11.00 CO-1:L13 **Thermal Condensation Reaction of Polydimethylsilane in a CO<sub>2</sub> Atmosphere for Synthesis of Polycarbosilane**  
**MASAKI NARISAWA**, KOUYA YAMADA, RINTARO HANATANI, HIROFUMI INOUE, Osaka Prefecture University, Sakai, Osaka, Japan
- 11.20 Break

### **Session CO-2 - Interfaces / Interphases**

*Chair:* Gerard VIGNOLES, France

- 11.50 CO-2:L01 **Active Metal Brazing of Composites for Thermal Management Applications**  
**R. ASTHANA**<sup>1</sup>, M. SINGH<sup>2</sup>, N. SOBCZAK<sup>3</sup>, J.J. SOBCZAK<sup>3</sup>, <sup>1</sup>University of Wisconsin-Stout, Menomonie, Wisconsin, USA; <sup>2</sup>Ohio Aerospace Institute, Cleveland, OH, USA; <sup>3</sup>Foundry Research Institute, Krakow, Poland
- 12.20 CO-2:L02 **Interfaces and Interface Design in CMCs**  
**J. LAMON**, CNRS/Ecole Normale Supérieure Paris - Saclay, Laboratoire de Mécanique et Technologie, Cachan, France

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room: ASSISI A*

### **Session CA-2 - Colloidal Processing**

*Chair: Begona FERRARI, Spain*

**14.30 CA-2:IL04 Processing of Stable and Reliable Zirconia Ceramics for Dental Applications**

**FEI ZHANG<sup>1, 2, 3</sup>, J. VLEUGELS<sup>1</sup>, H. REVERON<sup>3</sup>, T. FÜDERER<sup>4</sup>, S. SCHOMER<sup>4</sup>, N. COURTOIS<sup>5</sup>, A. LIENS<sup>3</sup>, B. VAN MEERBEEK<sup>2</sup>, J. CHEVALIER<sup>3</sup>**, <sup>1</sup>University of Leuven, Dept of Materials Engineering, Heverlee, Belgium; <sup>2</sup>University of Leuven & Dentistry, BIOMAT, Dept of Oral Health Sciences, University Hospitals Leuven, Leuven, Belgium; <sup>3</sup>University of Lyon, UMR CNRS 5510 (MATEIS), INSA de Lyon, France; <sup>4</sup>Ceramic Materials, Swerea IVF AB, Mölndal, Sweden; <sup>5</sup>ANTHOGYR, Sallanches, France

**15.00 CA-2:IL05 Colloidal Process of Hematite Photoanode for Solar Water Splitting**

**F.L. SOUZA**, Universidade Federal do ABC, Santo Andre, Sao Paulo, Brazil

**15.30 CA-2:IL06 New Water-based Organic Additives in Colloidal Processing of Ceramics and Composites**

**M. SZAFRAN**, Warsaw University of Technology, Faculty of Chemistry, Warsaw, Poland

**16.00 CA-2:L07 Homogeneity Enhancement of Additives on Boron Carbide by Precipitation Method**

**M.F. TOKSOY**, C. ELCI, Izmir Institute of Technology, Department of Mechanical Engineering, Turkey

**16.20 Break**

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### **Session CA-1 - Advances in Powder Synthesis and Characterisation**

*Chair: Kjell WIIK, Norway*

**16.50 CA-1:L07 Effect of Iron Oxide Coloring on the Microstructure, Mechanical Properties and Aging Stability of 3Y-TZP**

**E. WILLEMS<sup>1,2</sup>, F. ZHANG<sup>1,2</sup>, B. VAN MEERBEEK<sup>2</sup>, J. VLEUGELS<sup>1</sup>**, <sup>1</sup>Dept. of Metallurgy and Materials Engineering, KU Leuven, Kasteelpark Leuven, Belgium; <sup>2</sup>KU Leuven BIOMAT, Dept. of Oral Health Sciences, KU Leuven & Dentistry, University Hospitals Leuven, Leuven, Belgium

**17.10 CA-1:L08 Structural and Transport Properties of Neodymium Tungstates Prepared via Mechanochemical Activation**

**Y.N. BESPALKO**, V.A. SADYKOV, P.I. SKRYABIN, T.A. KRIEGER, Boreskov Institute of Catalysis, Novosibirsk, Russia; N.F. UVAROV, A.S. ULIHIN, Institute of Solid State Chemistry and Mechanochemistry, Novosibirsk, Russia

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room:* **ASSISI B**

### **Session CB-3 - Microwave Processing**

*Chair:* Lisa C. KLEIN, USA

- 14.30 CB-3:IL02 Microwave Versus Conventional Sintering of Pure and TiO<sub>2</sub> doped MgAl<sub>2</sub>O<sub>4</sub> Ceramics: Sintering Trajectory and Mechanisms**

**S. MARINEL<sup>1</sup>, R. MACAIGNE<sup>1</sup>, D. GOEURIOT<sup>2</sup>, S. SAUNIER<sup>2</sup>,** <sup>1</sup>CRISMAT Laboratory, University of Caen Normandy, France; <sup>2</sup>Ecole des Mines de Saint-Etienne, Dép. Science des Matériaux et des Structures, Saint-Etienne, France

- 15.00 CB-3:IL04 In Situ and Ex Situ Characterization of Microwave-assisted Synthesis of Functional Oxide Nanoparticles**

L. TINAT, E. CAZYUS-CLAVERIE, D. PORTEHAULT, C. CHANEAC, **O. DURUPTHY**, Laboratoire de Chimie de la Matière Condensée de Paris, UPMC Sorbonne Universités, Paris, France

- 15.30 CB-3:IL05 Electromagnetic Field Effects in High-temperature Microwave Processing of Materials**

**K.I. RYBAKOV**, Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia, and Advanced School of General and Applied Physics, Lobachevsky State University of Nizhny Novgorod, Russia

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room:* **SALA STAMPA**

### **Session CB-8.2 - Structure and Mechanics of Bio-inspired Materials**

*Chair:* Vladimir KATANAEV, Switzerland

- 15.00 CB-8.2:IL04 Architecture and Interface Design for Multifunctional Graphene/Copper Matrix Composites**

**DING-BANG XIONG**, MU CAO, ZHIQIANG LI, DI ZHANG, State Key Laboratory of Metal Matrix Composites, Shanghai Jiao Tong University, Shanghai, China

- 15.30 CB-8.2:IL06 Flake Powder Metallurgy: a Bioinspired Pathway to Aluminum Nanocomposites with Nacre-like Structure**

**ZHIQIANG LI**, GENLIAN FAN, ZHANQIU TAN, DINGBANG XIONG, QIANG GUO, YISHI SU, DI ZHANG, Shanghai Jiao Tong University, Shanghai, China

- 16.00 Break**

### **Session CB-8.3 - Bioinspired Functional Surfaces**

*Chair:* Sudipta SEAL, USA

- 16.30 CB-8.3:IL01 Bioactive and Antimicrobial Biofilm Ceramic Surfaces Synthesized by Advanced Pulsed Laser Technologies**

**I.N. MIHAILESCU<sup>1</sup>**, C. RISTOSC<sup>1</sup>, A. BIGI<sup>2</sup>, <sup>1</sup>National Institute for Lasers, Plasma and Radiation Physics, Magurele, Ilfov, Romania; <sup>2</sup>Department of Chemistry "G. Ciamician", University of Bologna, Bologna, Italy

- 17.00 CB-8.3:L02 Flexible and Superhydrophobic Vulcanized Rubber Microstructures**

**YUJI HIRAI<sup>1</sup>**, RIKU TAMURA<sup>1</sup>, MASATSUGU SHIMOMURA<sup>1</sup>, YASUTAKA MATSUO<sup>2</sup>, TAKAHIRO OKAMATSU<sup>3</sup>, TOSHIHIKO ARITA<sup>4</sup>, <sup>1</sup>Chitose Institute of Science and Technology, Chitose, Hokkaido, Japan; <sup>2</sup>RIES, Hokkaido university, Sapporo, Hokkaido, Japan; <sup>3</sup>THE YOKOHAMA RUBBER CO., LTD, Hiratsuka, Kanagawa, Japan; <sup>4</sup>IMRAM, Tohoku university, Sendai, Miyagi, Japan

- 17.20 CB-8.3:L03 Development and Characterization of Bioinspired Functional Coating on Different Substrates**

**R. TEJIDO-RASTRILLA**, G. BALDI, Colorobbia Consulting s.r.l., Sovigliana, Vinci, Florence, Italy; R. DETSCH, A.R. BOCCACCINI, Institute of Biomaterials, University of Erlangen-Nuremberg, Erlangen, Germany

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room:* **VIP**

### **Session CB-9.3 - Fused Deposition Modelling**

*Chair:* Nahum TRAVITZKY, Germany

- 14.30 **CB-9.3:IL01 Thermoplastic- and Suspension-based Additive Manufacturing of Multi-material Components**  
**U. SCHEITHAUER**, E. SCHWARZER, S. WEINGARTEN, J. ABEL, H.-J. RICHTER, T. MORITZ, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany
- 15.00 **CB-9.3:IL02 Materials and Processing Hybridization by Advanced Thermoplastic Additive Manufacturing**  
**T. MORITZ**, U. SCHEITHAUER, J. ABEL, A. MUELLER-KOEHN, A. GUENTHER, S. WEINGARTEN, A. MICHAELIS, Fraunhofer IKTS, Dresden, Germany
- 15.30 **CB-9.3:L04 Ethylene Vinyl Acetate as a Binder for Fused Deposition Modelling of Ceramic**  
**L. GORJAN<sup>1</sup>**, L. REIFF<sup>1,2</sup>, A. LIERSCH<sup>2</sup>, F. CLEMENS<sup>1</sup>, <sup>1</sup>Empa - Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; <sup>2</sup>Department of Materials Engineering, Glass and Ceramics, Hochschule Koblenz, Germany

15.50 *Break*

### **Session CB-9.4 - Stereolithography**

*Chair:* Soshu KIRIHARA, Japan

- 16.20 **CB-9.4:IL01 Microstereolithography Applied to Biomedical Devices**  
**A. LERICHE**, M. DEHURTEVENT, S. CHAMARY, H. CURTO, A. THUAULT, J.C. HORNEZ, Laboratoire des Matériaux Céramiques et Procédés Associés, Université de Valenciennes, Maubeuge, France; F. PETIT, F. CAMBIER, Belgian Ceramic Research Centre, Mons, Belgium; M.H. FERNANDEZ, Laboratory for Bone Metabolism and Regeneration, Universidade do Porto, Portugal; F. MONTEIRO, INEB, Universidade do Porto, Portugal
- 16.50 **CB-9.4:IL02 Printing and Characterization of Dense Oxide Ceramics using Lithographic AM**  
**J. VOGT**, T. MARTINI, M. STEPANYAN, Fraunhofer Center for High-Temperature Materials and Design (HTL), Bayreuth, Germany

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room:* **MONTEFALCO**

### **Session CC-1 - Friction and Wear**

*Chair:* Manuel BELMONTE, Spain

- 14.30 CC-1:L15 **Friction and Wear of Diamond: Atomic-scale Insights from Computer Simulations**

**G. MORAS**, Fraunhofer IWM, MicroTribology Centre, Freiburg, Germany

- 15.00 CC-1:L17 **Development of Si<sub>3</sub>N<sub>4</sub> – SiC Composites for Tribological Applications**

**P. ZIELONKA**, P. SCHREIBER, E.C. BUCHARSKY, K.G. SCHELL, J. SCHNEIDER, M.J. HOFFMANN, Institute for Applied Materials, Karlsruhe Institute of Technology, Karlsruhe, Germany

- 15.20 *Break*

- 15.50 CC-1:L19 **Surface Properties of Sulfnitrided Layer formed on AISI4140 Steel by Plasma Nitriding**

**HYUN JUN PARK**<sup>1, 2</sup>, SANG-SUP KIM<sup>2</sup>, KYOUNG IL MOON<sup>1</sup>, <sup>1</sup>Korea Institute of Industrial Technology, Heat Treatment R&D Group, Siheung-si, South Korea; <sup>2</sup>School of Materials Science and Engineering, Inha University, Incheon, South Korea

- 16.10 CC-1:L20 **Numerical Modelling of Nano / Micro Scratch Test Considering Scratch Tip Size Effect**

**KWANGMIN LEE**, K.P. MARIMUTHU, H. LEE, Sogang University, Seoul, South Korea

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## WEDNESDAY JUNE 6 AFTERNOON

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Room: SALA RELATORI

### Session CD-1 - Nano-scale Interface of Dissimilar Materials

Chair: Dominique CHATAIN, France

- 14.30 **CD-1:IL07 Reactive Wetting and Filling of Nanotubes by Molten Metals to Design Advanced Nanocomposites**  
P. NAUTIYAL, B. BOESL, **A. AGARWAL**, Plasma Forming Laboratory, Department of Mechanical and Materials Engineering, Florida International University, Miami, FL, USA
- 15.00 **CD-1:IL08 Atomic-scale Structural and Chemical Analysis of Heterointerfaces by Advanced Scanning Transmission Electron Microscopy**  
A. KUMAMOTO, N. SHIBATA, **YUICHI IKUHARA**, Institute of Engineering Innovation, School of Engineering, The University of Tokyo, Tokyo, Japan
- 15.30 **CD-1:IL09 Ionic Interdiffusion as Interaction Mechanism of Al and Si<sub>3</sub>N<sub>4</sub>**  
**E. ADABIFIROOZJAEI**<sup>1</sup>, F. EMADI<sup>2</sup>, P. KOSHY<sup>1</sup>, C.C. SORRELL<sup>1</sup>, <sup>1</sup>School of Materials Science and Engineering, UNSW Australia, Sydney, NSW, Australia; <sup>2</sup>Department of Materials Science and Engineering, Sharif University of Technology, Tehran, Iran
- 15.50 Break

### Session CD-2 - Micro-/Nano-joining

Chair: Arvind AGARWAL, USA

- 16.10 **CD-2:IL01 Electric Field Induced Equilibrium Grain Boundary Configurations in Ceramic Bicrystals**  
L. HUGHES, **K. VAN BENTHEM**, University of California, Davis, CA, USA
- 16.40 **CD-2:IL02 Metal-to-ceramics Joining using Reduction Reaction of Silver Oxide**  
**AKIO HIROSE**, K. ASAMA, K. MOTOYAMA, T. SANO, T. MATSUDA, Osaka University, Suita, Japan
- 17.10 **CD-2:IL03 Development of Nanostructured Joining Materials**  
**J. JANCZAK-RUSCH**, M. CHIODI, V. ARAULLO-PETERS, C. CANCELLIERI, L.P.H. JEURGENS, Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland
- 17.40 **CD-2:IL04 AE Evaluation of GaN Die-attach on DBC Substrate**  
**CHANYANG CHOE**, S.J. NOH, C. CHEN, S. NAGAO, K. SUGANUMA, The Institute of Science and Industrial Research, Osaka University, Osaka, Japan

### Session CD-4 - Application Engineering

- 18.00 **CD-4:IL01 Importance of Chemical Exchanges between Matrix and Reinforcement during Synthesis of Metal Matrix Composite**  
**O. DEZELLUS**, J. ANDRIEUX, B. GARDIOLA, Laboratoire des Multimatériaux et Interfaces, Université Lyon 1, Villeurbanne, France

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## WEDNESDAY JUNE 6 AFTERNOON

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Room: MAGIONE B

### Session CE-2 - Functional Metal Oxide Nano- and Heterostructures

Chair: Hisham MENKARA, USA

- 14.30 **CE-2:IL01 Designing Catalysts for Water-Splitting Reactions: Oxide-Oxide Bilayers as High Efficiency Photoelectrocatalysts**  
**S. MATHUR**, Inorganic and Materials Chemistry University of Cologne, Cologne, Germany

- 15.00 **CE-2:IL02 ZnO Particles with Hierarchical Structures and Gas Sensing Application**  
**NORIKO SAITO**, H. HANEDA, I. SAKAGUCHI; K. WATANABE, K. SHIMANOE, National Institute for Materials Science, Tsukuba, Japan; Kyushu University, Fukuoka, Japan

- 15.30 **CE-2:IL04 Chemical Synthesis of TiO<sub>2</sub> and Complex Nanocrystals by Means of Colloidal Approaches**  
**M. EPIFANI**, CNR-IMM, Lecce, Italy

16.00 Break

Chair: Noriko SAITO, Japan

- 16.30 **CE-2:IL05 Portable Static Hydroelectric Cell with Mesoporous SnO<sub>2</sub> as the Backbone**  
V. SOLANKI, S.B. KRUPANIDHI, **K.K. NANDA**, Materials Research Centre, Indian Institute of Science, Bangalore, India

- 17.00 **CE-2:L06 Functionalization of Oxide Banocrystals with Transition Metal Ions**  
**M. NIEDERMAIER**, University of Salzburg, Salzburg, Austria; A. GHEISI, Friedrich-Alexander-University Erlangen, Bavaria, Erlangen, Germany; J. BERNARDI, Vienna University of Technology, Vienna, Austria; O. DIWALD, University of Salzburg, Salzburg, Austria

### Session CE-3 - Functional Materials and Sustainability

- 17.20 **CE-3:IL09 Composite Nanostructures for High-efficiency Sunlight Harvesting**  
**A. VOMIERO**, Department of Engineering Science and Mathematics, Lulea University of Technology, Lulea, Sweden

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room: ORVIETO A*

### **Session CF-2 - Corrosion, Oxidation, and Testing**

*Chair: Hagen KLEMM, Germany*

- 14.30 CF-2:IL03 Creep of HfB<sub>2</sub>-based UHTCs up to 2000 °C: A Critical Assessment on Structural Stability for Hypersonic Applications**

**E. ZAPATA-SOLVAS<sup>1</sup>, D. GÓMEZ-GARCIA<sup>2</sup>, A. DOMÍNGUEZ-RODRÍGUEZ<sup>2</sup>, W.E. LEE<sup>1</sup>, <sup>1</sup>Centre for Nuclear Engineering (CNE), Dept. Materials, Imperial College London, UK; <sup>2</sup>Dept. Condensed Matter Physics, University of Seville, Seville, Spain**

- 15.00 CF-2:IL04 Relation between Microstructure and Protection Efficiency of a Rare Earth Silicate-based Environmental Barrier Coating**

**F. REBILLAT<sup>1</sup>, S. ARNAL<sup>1</sup>, F. MAUVY<sup>2</sup>, <sup>1</sup>Laboratoire des Composites Thermostructuraux, Pessac, France; <sup>2</sup>Institut de Chimie de la Matière Condensée de Bordeaux, Pessac, France**

- 15.30 Break**

*Chair: Francis REBILLAT, France*

- 16.00 CF-2:IL05 Cyclic Oxidation of Ti<sub>3</sub>Al-based Materials**

**I. CVIJOVIC-ALAGIC, M.T. JOVANOVIC, D. ZAGORAC, B. MATOVIC, Institute of Nuclear Sciences "Vinča", University of Belgrade, Belgrade, Serbia; Z. CVIJOVIC, Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia**

- 16.30 CF-2:IL07 Corrosion Behavior of Slurry Coated RE Monosilicate EBCs on SiC/SiC**

**N. AL NASIRI, Imperial College London, London, UK**

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room: ORVIETO B*

### **Session CG-3 - Mechanical Properties and Oxidation of MAX/MAB/MXenes**

*Chair: Anne JOULAIN, France*

**14.30 CG-3:IL05 Ablation and Thermal Shock Behaviours of MAX Phases**

**SHIBO LI**, Center of Materials Science and Engineering, School of Mechanical and Electronic Control Engineering, Beijing Jiaotong University, Beijing, China

**15.00 CG-3:IL06 Mechanical Behavior and Strengthening of Alumina forming MAX Phases**

**M. RADOVIC<sup>1</sup>**, R. BENITEZ<sup>2</sup>, HULI GAO<sup>2</sup>, YEXIAO CHEN<sup>1</sup>, WEN HAO KAN<sup>3</sup>, G. PROUST<sup>3</sup>, P. NAIK PARRIKAR<sup>4</sup>, ARUN SHUKLA<sup>4</sup>, <sup>1</sup>Department of Material Science and Engineering, Texas A&M University, College Station, TX, USA; <sup>2</sup>Department of Mechanical Engineering, Texas A&M University, College Station, TX, USA; <sup>3</sup>School of Civil Engineering, The University of Sydney, NSW, Australia; <sup>4</sup>Department of Mechanical, Industrial and Systems Engineering, University of Rhode Island, Kingston, RI, USA

**15.30 Break**

### **Session CG-4 - MAX/MAB and MXenes Composites and their Properties**

*Chair: Shibo LI, China*

**16.00 CG-4:IL01 On the Processing and Characterization of MRM (MAX and MAB Reinforced Metals) Composites**

**S. GUPTA**, M. FUKA, F. ALANAZI, S. GHOSH, M. DEY, University of North Dakota, Grand Forks, ND, USA

**16.30 CG-4:L02 Influence of Secondary Phases on Mechanical Properties of MAX Phases**

**K. KOZAK**, G. ANTOU, T. CHOTARD, Université de Limoges, SPCTS, UMR 7315, Limoges, France; J. LIS, L. CHLUBNY, AGH UST, Cracow, Poland

**16.50 CG-4:L03 Magnetic Ordering Investigation in Mn<sub>2</sub>AlB<sub>2</sub> using Neutron Diffraction**

**D. POTASHNIKOV**, IAEC, Tel-Aviv, Israel; O. RIVIN, A. PESACH, E.N. CASPI, NRCN, Beer-Sheva, Israel; A. HOSER, HZB, Berlin, Germany; S. KOTA, M.W. BARSOUM, Drexel University, Philadelphia, PA, USA

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## WEDNESDAY JUNE 6 AFTERNOON

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Room: SPOLETO B

### Session CH-4 - Tribological Thin Films and Coatings

Chair: Luca LUSVARGHI, Italy

- 14.30 **CH-4:L01 Self-Adaptive Mechanisms in Tribological Coatings Designed for Harsh Environment Applications**  
**A.A. VOEVODIN**, S. AOUADI, University of North Texas, Denton, TX, USA; C. MURATORE, University of Dayton, Dayton, OH, USA
- 15.00 **CH-4:L02 Self Adaption In Tribological Coatings**  
**A. CAVALEIRO**, F. FERNANDES, SEG-CEMMPRE, University of Coimbra and LED&Mat, Instituto Pedro Nunes, Coimbra, Portugal; T. POLCAR, FEL-CVUT, Czech Technical University, Prague, Czech Republic and nCATS, University of Southampton, UK
- 15.30 **CH-4:L03 Tribological Properties of Hydrogenated W-C/ a-C:H Coatings in Different Environments**  
**F. LOFAJ<sup>1</sup>**, D. MEDVED<sup>1</sup>, M. KABATOVA<sup>1</sup>, J. NOHAVA<sup>2</sup>, J. DOBROVODSKY<sup>3</sup>, P. NOGA<sup>3</sup>, <sup>1</sup>Institute of Materials Research of SAS, Kosice, Slovakia; <sup>2</sup>Anton Paar, Peseux, Switzerland; <sup>3</sup>Advanced Technologies Research Institute, Slovak University of Technology in Bratislava, Trnava, Slovakia
- 15.50 **CH-4:L04 Chemical Vapour Deposition of ZrN using insitu Produced ZrCl<sub>4</sub> as a Precursor**  
**E. RAUCHENWALD**, R. HAUBNER, Institute of Chemical Technol. and Analytics, TU Wien, Vienna, Austria; M. LESSIAK, R. WEISSENBACHER, Boehlerit GmbH & Co. KG, Kapfenberg, Austria
- 16.10 Break

### Session CH-1 - Advances in Deposition, Surface Modification and Characterisation Techniques

Chair: Aleksey YEROKHIN, UK

- 16.30 **CH-1:L06 Non Reactive High Impulse Magnetron Sputtering of Oxide Ceramics**  
R. GADOW, A. KILLINGER, Institute for Manufacturing Technologies of Ceramic Components and Composites, University of Stuttgart, Stuttgart, Germany; **B. GAEDIKE**, M. LUIK, Hartmetall-Werkzeugfabrik Paul Horn GmbH, Tuebingen, Germany
- 17.00 **CH-1:L07 Aerosol Deposition: A Top-down Approach to Nano-crystalline, Functional Ceramic Films and Tribological Coatings**  
**P.A. FUERER**, Materials & Metallurgical Engineering Dept., New Mexico Tech, Socorro, NM, USA
- 17.20 **CH-1:L08b Microstructural Characteristics and Corrosion Resistance of Atmospheric Pressure Chemical Vapor Deposited SiO<sub>2</sub> Films from TEOS and O<sub>2</sub>**  
**S. PONTON**, F. DHAINAUT, CIRIMAT and LGC, Toulouse, France; H. VERGNES, B. CAUSSAT, LGC, Toulouse, France; D. SAMÉLOR, D. SADOWSKI, C. VAHLAS, CIRIMAT, Toulouse, France
- 17.40 **CH-1:L10 Silicon Oxycarbide Coatings by Low Pressure Chemical Vapour Deposition**  
**F. DEMEYER**, S. JACQUES, Y. LE PETITCORPS, University of Bordeaux, CNRS, Safran, CEA, Laboratoire des Composites Thermostructuraux (LCTS), UMR 5801, Pessac, France; A. DELEHOUZE, Safran Ceramics, Safran Group, Le Haillan, France

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room: MAGIONE A*

### **Session CI-2 - Absorption, Capillary Phenomena and Thermophysical Behaviour**

*Chair: Giovanni BRUNO, Germany*

- 14.30 **CI-2:IL02 Thermophysical Behaviour of Porous Ceramics in Atmospheres with Controlled Humidity. Relevance to Drying of Green Bodies**  
**B. NAIT-ALI**, S. OUMMADI, A. ALZINA, C. DANGLADE, M. ZOUAOUI, D.S. SMITH, University of Limoges, Limoges, France
- 15.00 **CI-2:IL03 Hierarchically Porous Metal Hydroxides Through an Assembly of Crystalline Nanobuilding Blocks**  
**YASUAKI TOKUDOME**, M. TAKAHASHI, Department of Materials Science, Graduate School of Engineering, Osaka Prefecture University, Sakai, Japan
- 15.30 **CI-2:IL04 Low Temperature Processing of Silicon Carbide Membranes for Wastewater Treatment**  
**YOUNG-WOOK KIM**, HEE-JONG YEOM, HUI-YING SHENG, Functional Ceramics Laboratory, Department of Materials Science and Engineering, University of Seoul, Seoul, South Korea
- 16.00 *Break*

### **Session CI-1 - Novel Synthesis and Processing**

*Chair: Yoshikazu SUZUKI, Japan*

- 16.30 **CI-1:IL17 Controlling the Pore Structure of Porous Ceramics Fabricated by the Gel-casting Method**  
**YUNZI XIN**, DAISUKE ASAI, JEONGSOO HONG, TAKASHI SHIRAI, Advanced Ceramics Research Center, Nagoya Institute of Technology, Nagoya, Aichi, Japan
- 17.00 **CI-1:L18 Tailoring the Microstructure of TiO<sub>2</sub> Photoactive Electrodes by using Cellulose Nanofibers and by Polyelectrolyte Multilayer Absorption**  
**Z. GONZALEZ GRANADOS<sup>1</sup>**, J. YUS<sup>1</sup>, A.J. SANCHEZ-HERENCIA<sup>1</sup>, A. RODRÍGUEZ<sup>2</sup>, J. DEWALQUE<sup>3</sup>, L. MANCERIU<sup>3</sup>, C. HENRIST<sup>3</sup>, B. FERRARI<sup>1</sup>, <sup>1</sup>Institute of Ceramics and Glass, CSIC, Tailoring through Colloidal Processing Group 5, Madrid, Spain; <sup>2</sup>Chemical Engineering Department, University of Cordoba, Campus de Rabanales, Cordoba, Spain; <sup>3</sup>University of Liege, Group of Research in Energy and Environment from Materials (GREENMAT), Liege, Belgium University
- 17.20 **CI-1:IL20 Advanced Nanoporous Carbon Based Materials: Challenges and Opportunities**  
**A. VINU**, Global Innovation Chair Professor and Director, Global Innovative Center for Advanced Nanomaterials, Faculty of Natural Built Environment and Engineering, The University of Newcastle, Callaghan, Newcastle, NSW, Australia

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room:* **SPOLETO A**

### **Session CJ-1 - Dielectrics and Microwave Materials**

*Chair:* Juras BANYS, Lithuania

**14.30 CJ-1:L04 Electrical Resistivity of Silicon Nitride Produced by Various Methods**

**O. LUKIANOVA**, Belgorod State National Research University, Belgorod, Russia

**14.50 CJ-1:L05 Aluminiumoxide and Hafniumoxide as Nonlinear Dielectrics**

L. KANKATE, **H. KLIEM**, Institute of Electrical Engineering Physics, Saarland University Campus A5, Saarbruecken, Germany

**15.10 CJ-1:L07 Ceramics Materials and Microelectronic Energy Frontiers**

**V.V. MITIC<sup>1,2</sup>**, V. PAUNOVIC<sup>1</sup>, N. CVETKOVIC<sup>1</sup>, G. LAZOVIC<sup>3</sup>, L. KOVIC<sup>1</sup>, <sup>1</sup>University of Nis, Faculty of Electronic Engineering, Nis, Serbia; <sup>2</sup>Institute of Technical Sciences of SASA, Belgrade, Serbia; <sup>3</sup>University of Belgrade, Faculty of Mechanical Engineering, Belgrade, Serbia

**15.30 Break**

### **Session CJ-2 - Ferroelectric, Piezoelectric, Pyroelectric, and Ferroelastic Ceramics**

*Chair:* Joshua AGAR, USA

**16.00 CJ-2:L13 Enhanced Piezoelectric Properties in PNZT-ZrO<sub>2</sub> Composites at Low Frequencies**

**M. ACUAUTLA**, S. DAMERIO, V. OCELIK, B. NOHEDA, Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands

**16.20 CJ-2:L14 Structure-bandgap Relationship in Ba(M,Ti)O<sub>3</sub> Ferroelectric Solid Solutions**

**H. VOLKOVA<sup>1</sup>**, P. GEMEINER<sup>1</sup>, J. GUILLOT<sup>2</sup>, D. LENOBLE<sup>2</sup>, N. CHAUVIN<sup>3</sup>, F. KAROLAK<sup>1</sup>, C. BOGICEVIC<sup>1</sup>, B. DKHIL<sup>1</sup>, I.C. INFANTE<sup>3</sup>, <sup>1</sup>Laboratoire SPMS, CentraleSupélec, CNRS-UMR8580, Université Paris-Saclay, Gif-sur-Yvette, France; <sup>2</sup>Luxembourg Institute of Science and Technology (LIST), Materials Research and Technology (MRT) Department, Belvaux, Luxembourg; <sup>3</sup>Institut des Nanotechnologies de Lyon (INL), CNRS-UMR5270 ECL INSA UCBL CPE, Villeurbanne Cedex, France

**16.40 CJ-2:L15 Soft Mode and Microwave Dielectric Relaxation in Low-lead BT-PMN Ceramics**

**V. BOVTUN**, D. NUZHNYY, M. KEMPA, T. OSTAPCHUK, J. PETZELT, S. KAMBA, Institute of Physics CAS, Prague, Czech Rep.; J. SUCHANICZ, K. KONIECZNY, Pedagogical University, Cracow, Poland

**17.00 CJ-2:L16 Modeling the Size Effects in Ferroelectric Ceramics with Different Grain Sizes**

**L. PADURARIU**, C. CIOMAGA, L. CURECHERIU, L. MITOSERIU, Faculty of Physics, Al. I. Cuza University of Iasi, Iasi, Romania

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## WEDNESDAY JUNE 6 AFTERNOON

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Room: CORCIANO

### Session CK-3 - Electronic Structure and Correlation Effects

Chair: Stephen WILSON, USA

- 14.30 CK-3:IL01 Correlated Electronic Structure of Oxide Heterostructures  
**F. LECHERMANN**, Institut für Theoretische Physik, Universität Hamburg, Hamburg, Germany
- 15.00 CK-3:IL02 Charge Transfer Effects in Rare Earth Nickelates  
**J. VARIGNON**<sup>1</sup>, M.N. GRISOLIA<sup>1</sup>, J. INIGUEZ<sup>2</sup>, A. BARTHELEMY<sup>1</sup>, M. BIBES<sup>1</sup>, <sup>1</sup>Unité Mixte de Physique, CNRS, Thales, Université Paris Sud, Université Paris-Saclay, Palaiseau, France; <sup>2</sup>Materials Research and Technology Department, Luxembourg Institute of Science and Technology (LIST), Esch/Alzette, Luxembourg
- 15.30 CK-3:IL03 Emergent Quantum Phases in Relativistic Magnetic Oxides  
**C. FRANCHINI**, University of Vienna, Vienna, Austria
- 16.00 CK-3:IL04 High Pressure Synthesis of Oxides and Mixed-anion Oxides with Novel Magnetic and Transport Properties  
HIROSHI KAGEYAMA, **HIRASHI TAKATSU**, Kyoto University, Kyoto, Japan

16.30 Break

### Session CK-4 - Interplay Between Spin, Charge and Lattice Degrees of Freedom

Chair: Cesare FRANCHINI, Austria

- 17.00 CK-4:IL01 Unconventional Metals from Doped Spin-orbit Assisted Mott States  
**S.D. WILSON**, University of California at Santa Barbara, Santa Barbara, CA, USA
- 17.30 CK-4:IL02 Magnon Study in (Y, Lu)MnO<sub>3</sub> System using Raman Spectroscopy  
**SEUNG KIM**<sup>1</sup>, JIYEON NAM<sup>1</sup>, THI HUYEN NGUYEN<sup>1</sup>, IN-SANG YANG<sup>1</sup>, XUEYUN WANG<sup>2</sup>, SANG-WOOK CHEONG<sup>2</sup>, <sup>1</sup>Department of Physics, Ewha Womans University, Seoul, South Korea; <sup>2</sup>Rutgers Center for Emergent Materials and Department of Physics and Astronomy, Rutgers University, Piscataway, NJ, USA

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room:* **NORCIA**

### **Session CL-3 - Transparent Conducting and Non-conducting Ceramics**

*Chair:* Adrian GOLDSTEIN, Israel

**14.30 CL-3:IL02 Chalcogenide Glass-ceramics Transparent in the Infrared**

**L. CALVEZ**, Glass and ceramic team UMR-CNRS 6226, Institute of Chemical Sciences of Rennes, Univ. de Rennes 1, Rennes, France

**15.00 CL-3:IL03 Transparent Ceramics Based on Rare Earth Ions-doped Cubic Tungstate/Molybdate Matrices: A Challenge and Prospect for New Efficient Optical Materials?**

**M. GUZIK<sup>1</sup>**, M. BIEZA<sup>1</sup>, E. TOMASZEWCZ<sup>2</sup>, Y. GUYOT<sup>3</sup>, G. BOULON<sup>3</sup>, <sup>1</sup>Faculty of Chemistry, University of Wrocław, Wrocław, Poland; <sup>2</sup>Dept. of Inorganic and Analytical Chemistry, West Pomeranian Univ. of Technology, Szczecin, Poland; <sup>3</sup>Univ. Claude Bernard Lyon1, CNRS, Institut Lumière Matière, Villeurbanne, France

**15.30 CL-3:L04 Spark Plasma Sintering (SPS) of Alumina-based Transparent Ceramics**

**A. PILLE<sup>1</sup>**, A. KANAEV<sup>1</sup>, T. BILLETON<sup>2</sup>, E. FELDBACH<sup>3</sup>, F. SCHÖENSTEIN<sup>1</sup>, <sup>1</sup>Lab. de Sciences des Procédés et des Matériaux, CNRS UPR-3407, Université Paris 13, Sorbonne Paris Cité, Villetaneuse, France; <sup>2</sup>Lab. de Physique des Lasers, CNRS UMR-7538, Université Paris 13, Sorbonne Paris Cité, Villetaneuse, France; <sup>3</sup>Institute of Physics, University of Tartu, Tartu, Estonia

**15.50 Break**

### **Session CL-4 - Laser Materials**

*Chair:* John BALLATO, USA

**16.20 CL-4:IL01 Optical Ceramics for High Energy Lasers**

J. SANGHERA<sup>1</sup>, **W. KIM<sup>1</sup>**, G. VILLALOBOS<sup>1</sup>, S. BAYYA<sup>1</sup>, C. BAKER<sup>1</sup>, M. HUNT<sup>1</sup>, B. SHAW<sup>1</sup>, J. FRANTZ<sup>1</sup>, B. SADOWSKI<sup>2</sup>, R. MIKLOS<sup>2</sup>, L. BUSSE<sup>1</sup>, D. BOYD<sup>1</sup>, I. AGGARWAL<sup>2</sup>, C. ASKINS<sup>1</sup>, J. MYERS<sup>1</sup>, J. PEELE<sup>2</sup>, D. RHONEHOUSE<sup>1</sup>, R. THAPA<sup>2</sup>, S. BOWMAN<sup>1</sup>, <sup>1</sup>Naval Research Laboratory, Optical Science Division, Washington, DC, USA; <sup>2</sup>Sotera Defense Solutions, Herndon, VA, USA

**16.50 CL-4:IL02 Yb:CaF<sub>2</sub> Laser Ceramics: Synthesis and Physical Characterizations**

**M. MORTIER**, J. SARTHOU, P. GREDIN, Institut de Recherche de Chimie Paris, CNRS - Chimie ParisTech, PSL Research University France; F. DRUON, J. HOSTALRICH, P. GEORGES, Lab. Charles Fabry, UMR 8501, Institut d'Optique, CNRS, Univ. Paris Sud, Palaiseau, France

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room: CASCIA*

### **Session CM-3 -Coating and Decoration of Silicate Ceramics**

*Chair: Adriano M. BERNARDIN, Brazil*

- 14.30 CM-3:IL01 Viscous Flow Sintering in Ceramic Glaze and Body Compositions**

**J.L. AMOROS**, A. MORENO, E. BLASCO, Instituto de Tecnología Cerámica (ITC). Asociación de Investigación de las Industrias Cerámicas (AICE), Universitat Jaume I, Castellón, Spain

- 15.00 CM-3:IL02 Influence of Printing Parameters on Optical Properties of Ink-jet Ceramic Decoration**

**C. FERRARI**, C. SILIGARDI, Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy

- 15.30 CM-3:IL04 Improvement of Colour Quality and Reduction of Defects in the Ink jet-printing Technology for Ceramic Tiles Production: A Design of Experiments Study**

**M. MONTORSI**, Dept. of Science and Methods for Engineering, University of Modena and Reggio Emilia, Reggio Emilia, Italy

- 16.00 CM-3:L05 Impact of Alkali Metal Oxygens on Structure and Properties of Ceramic Glazes**

**J. PARTYKA**, K. PASIUT, M. LESNIAK, M. BUCKO, AGH University of Science and Technology, Krakow, Poland

**16.20 Break**

### **Session CM-2 - Green Silicate Ceramics**

*Chair: Urska LAVRENCIC STANGAR, Slovenia*

- 16.50 CM-2:IL07 Green Silicate Ceramics Based on Agro-residues**

**L. BARBIERI**<sup>2</sup>, F. ANDREOLA<sup>1</sup>, R.D. FARIAS<sup>2</sup>, C. MARTÍNEZ GARCÍA<sup>2</sup>, I. LANCELLOTTI<sup>1</sup>, T. COTES PALOMINO<sup>2</sup>, <sup>1</sup>Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy; <sup>2</sup>Department of Chemical, Environmental and Material Engineering, High Polytechnic School of Linares, University of Jaen, Linares Scientific and Technological Campus, Linares, Spain

- 17.20 CM-2:L08 High-content Waste-based Bodies for Porcelain Stoneware Tiles: Technological Profiling**

**R. SOLDATI**, C. ZANELLI, G. GUARINI, M. DONDI, CNR-ISTEC, Faenza, Italy; E. RAMBALDI, M.C. BIGNOZZI, Centro Ceramico, Bologna, Italy

- 17.40 CM-2:L09 Technical Feasibility of Using Cigarettes Butts in Manufacturing of Bricks (LADRICOL)**

**K.M. CORREDOR**, A.A. GUZMÁN, N.C TORRES, Escuela Colombiana de Ingeniería Julio Gravito, Bogotá, Colombia

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room:* **BEVAGNA**

### **Session CN-5 - Refractory Failure Analysis**

*Chair:* Marc HUGER, France

- 14.30 **CN-5:IL01 Post-mortem Analysis of Refractory Wear in Metal Processing Caused by Slag and Temperature – The Importance of Understanding the Process and Requirements for the Slag**

**A.M. GARBERS-CRAIG**, Centre for Pyrometallurgy, Department of Materials Science & Metallurgical Engineering, University of Pretoria, Pretoria, South Africa

- 15.00 **CN-5:L02 Stability of Thermal Insulating Materials Used in Hall-Héroult Cells**

**R. LUNENG**, T. GRANDE, Department of Materials Science and Engineering, NTNU, Norwegian University of Science and Technology, Trondheim, Norway; S.N. BERTEL, J. MIKKELSEN, Skamol A/S, Nykøbing Mors, Denmark; A.P. RATVIK, SINTEF Materials and Chemistry, Trondheim, Norway

- 15.20 **CN-5:L03 MgO Refractory Wear in the Ferrovanadium Production Process**

**M.C.J. VAN DER MERWE**, R.D. CROMARTY, A.M. GARBERS-CRAIG, Centre for Pyrometallurgy, Department of Materials Science and Metallurgical Engineering, University of Pretoria, South Africa

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## **WEDNESDAY JUNE 6 AFTERNOON**

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*Room:* **SPELLO**

### **Session CO-2 - Interfaces / Interphases**

*Chair:* Rajiv ASTHANA, USA

- 14.30 CO-2:IL03 **Fiber-matrix Interfaces Optimized for Nuclear and Thermomechanical Applications**  
C. FELLAH, J. BRAUN, C. SAUDER, Den-Service de Recherche de Métallurgie Appliquée (SRMA), DEA, Université Paris-Saclay, Gif-sur-Yvette, France; M.-H. BERGER, MINES ParisTech, PSL Research University, MAT - Centre des matériaux, CNRS UMR 7633, Evry, France
- 15.00 CO-2:IL05 **Pyrocarbon Interphases in Carbon/Carbon and Ceramic-Matrix Composites: Modelling Activities**  
G.L. VIGNOLES, University of Bordeaux, CNRS, Safran, CEA : Lab. for ThermoStructural Composites (LCTS) - UMR5801, Pessac, France
- 15.30 CO-2:L06 **RE<sub>2</sub>Si<sub>2</sub>O<sub>7</sub> Disilicates: Promising Oxidation and Corrosion Resistant Weak Interface in SiCf/SiC CMC**  
JINGYANG WANG, High-Performance Ceramics Division, Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS, Shenyang, China
- 15.50 *Break*

### **Session CO-3 - Processing and Fabrication of MMCS, CMCS, and C/C Composites**

*Chair:* Jacques LAMON, France

- 16.20 CO-3:IL01 **Design, Structure and Properties of Organomorphic Composites as New Materials**  
E.A. BOGACHEV, Joint Stock Company "Kompozit", Korolev, Moscow region, Russia
- 16.50 CO-3:IL02 **Fast and Ultra-fast Sintering of Ceramics by Plastic Deformation as Dominating Mechanism**  
ZHENGYI FU, Wuhan University of Technology, Wuhan, China
- 17.20 CO-3:L03 **Multi-functionally Graded Electroconductive Alumina**  
I. HUSSAINOVA, Tallinn University of Technology, Tallinn, Estonia

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## THURSDAY JUNE 7 MORNING

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Room: ASSISI A

### Session CA-3 - Shape Forming and Green Body Processing and Characterization

Chair: Makio NAITO, Japan

- 9.00 CA-3:L06 **Comparison of Different Methods for Polycrystalline Er:YAG Ceramics**  
**M. LAGNY**, J. BOEHMLER, E. BARRAUD, S. LEMONNIER, S. BIGOTTA, M. EICHHORN, Institut franco-allemand de recherches de Saint Louis, Saint Louis, France; Y. LORGOUILLOUX, A. LERICHE, Laboratoire des Matériaux Céramiques et procédés Associés, LMCPA, Pôle universitaire de Maubeuge, Maubeuge, France
- 9.20 CA-3:IL07 **Multilayer Ceramic Systems by Tape Casting Process**  
**P.-M. GEFFROY**, R. BOULESTEIX, E. BÉCHADE, T. CHARTIER, SPCTS, Université de Limoges, Limoges, France
- 9.50 CA-3:IL08 **Advanced Techniques for Green Body Characterization and Control of Sintered Texture**  
**SATOSHI TANAKA**, Nagaoka University of Technology, Nagaoka Niigata, Japan
- 10.20 CA-3:L09 **Development of Transparent Ceramics: Understanding and Control of Microstructure**  
**R. STOCKY**, J. BOEHMLER, S. LEMONNIER, French-German Research Institute of Saint-Louis, France; Y. LORGOUILLOUX, A. LERICHE, University of Valenciennes and Hainaut-Cambrésis, France
- 10.40 CA-3:L10 **In-situ Coagulation Casting of Ceramic Suspension via Dispersant Removal**  
**KE GAN**, YANJIAO GAI, SHU YAN, YUJU LU, JINLONG YANG, State Key Lab. of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China
- 11.00 Break

### Session CA-4 - Sintering

Chair: Eugene OLEVSKY, USA

- 11.30 CA-4:IL01 **On the Role of the Electric Field on the Sintering of Oxide Ceramics**  
**O. GUILLON**, Forschungszentrum Juelich, Juelich, Germany
- 12.00 CA-4:IL02 **Discrete Element Simulation of Sintering**  
D. JAUFFRES, **C.L. MARTIN**, Univ. de Grenoble Alpes, CNRS, Grenoble-INP, SIMaP, Grenoble, France; A. LICHTNER, Dept. of Mat. Sci. and Eng., University of Washington, Seattle, Washington, USA; R.K. BORDIA, Dept. of Mat. Sci. and Eng., Clemson University, Clemson, South Carolina, USA; J. VILLANOVA, ESRF, The European Synchrotron CS 40220, Grenoble Cedex, France
- 12.30 CA-4:IL03 **Microstructural Control and Characterization of Dense and Porous Ceramics**  
**W. PABST**, T. UHLIROVA, V. NECINA, E. GREGOROVA, Department of Glass and Ceramics, University of Chemistry and Technology, Prague, Czech Republic

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## THURSDAY JUNE 7 MORNING

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Room: ASSISI B

### Session CB-4 - Electrical Field and Pressure Assisted Synthesis and Sintering

Chair: Vincenzo M. SGLAVO, Italy

- 9.30 **CB-4:IL01 Spark Plasma Sintering Mechanisms of Zirconium Oxycarbides and Alumina**

**A. MAITRE**, G. ANTOU, N. PRADEILLES, Lab. SPCTS, CEC, Limoges, France

- 10.00 **CB-4:IL02 Ultra-high Pressure Synthesis of New Nitrides**

**KEN NIWA**, MASASHI HASEGAWA, Nagoya University, Nagoya, Japan

- 10.30 **CB-4:IL03 Low Temperature Development of Calcium Sialons along the Alpha/(alpha+beta) Phase Boundary using Nano-size Oxi-nitride Precursors and Spark Plasma Sintering Technique**

B.A. AHMED, A.S. HAKEEM, **T. LAOUI**, King Fahd University of Petroleum and Minerals (KFUPM) Dhahran, Saudi Arabia

10.50 Break

Chair: Ken NIWA, Japan

- 11.20 **CB-4:IL05 Flash Sintering of Alumina and other Oxide Ceramics**

**V.M. SGLAVO**, M. BIESUZ, Department of Industrial Engineering, University of Trento & INSTM, Florence, Italy

- 11.50 **CB-4:IL06 Spark Plasma Sintering of ceramics: From Controlling the Microstructures to the Development of Complex Shapes**

C. MANIERE<sup>1</sup>, G. CHEVALLIER<sup>1</sup>, L. DURAND<sup>2</sup>, F. AHMAD<sup>1</sup>, G. CHEVALLIER<sup>1</sup>, A. WEIBEL<sup>1</sup>, F. MAUVY<sup>3</sup>, R. EPHERRE<sup>1</sup>, C. ELISSALDE<sup>3</sup>, M. MAGLIONE<sup>3</sup>, **C. ESTOURNES**<sup>1</sup>, <sup>1</sup>CIRIMAT, Université de Toulouse, CNRS, UT3, INPT, Toulouse Cedex, France; <sup>2</sup>CEMES, Univ. Toulouse, CNRS, Toulouse Cedex, France; <sup>3</sup>ICMCB, CNRS UPR 9048, Université Bordeaux, Pessac, France

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## **THURSDAY JUNE 7 MORNING**

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*Room:* **SALA STAMPA**

### **Session CB-8.4 - Bioinspired Materials for Biomedical Applications**

*Chair:* Nils KROEGER, Germany

- 9.30 **CB-8.4:IL01 Multifunctionalized Calcium Phosphates with Anti-resorptive, Anti-Inflammatory and Anti-bacterial Properties**  
**E. BOANINI**, Department of Chemistry "Ciamician", University of Bologna, Italy

- 10.00 **CB-8.4:IL02 Major Advances in 2D Ceramic Hybrid Materials in Nanomedicine: Challenges and Future Directions**  
**JIN-HO CHOY**, Center for Intelligent Nano-Bio Materials (CINBM), Department of Chemistry and Nano Science, Ewha Womans University, Seoul, South Korea

10.30 *Break*

- 11.00 **CB-8.4:L04 Boron Neutron Capture Therapy Assisted by Drug Delivery System**  
**GOEUN CHOI**, JIN-HO CHOY, Center for Intelligent Nano-Bio Materials (CINBM), Department of Chemistry and Nano Science, Ewha Womans University, Seoul, South Korea

### **Session CB-8.5 - Application and Performance of Bioinspired Materials**

- 11.20 **CB-8.5:IL01 A Highly Sensitive, Reproducible and Uniform SERS Substrate with 3-dimensional Distributed Hotspots of High Density: Gyroid-structured Au Periodic Metallic Materials**  
**DI ZHANG**, WANG ZHANG, Department of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai, China

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## THURSDAY JUNE 7 MORNING

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Room: **VIP**

### **Session CB-9.4 - Stereolithography**

Chair: Anne LERICHE, France

- 9.00 **CB-9.4:IL03 Stereolithographic Additive Manufacturing of Ceramic Groove Chambers for Stream Lines Modulations of Energy and Material Flows**  
**SOSHU KIRIHARA**, Osaka University, Joining and Welding Research Institute, Osaka, Japan
- 9.30 **CB-9.4:IL04 Future Advanced Ceramic Materials with Triple Periodic Minimal Surface Topology**  
**V.Ya. SHEVCHENKO**, M.M. SYCHOV, S.P. BOGDANOV, L.A. LEBEDEV, Institute of Silicate Chemistry, Russian Academy of Sciences (ISC RAS), St. Petersburg, Russia
- 10.00 **CB-9.4:L05 Development of Ce-TZP-Al<sub>2</sub>O<sub>3</sub> based UV Sensitive Resin for Stereolithography**  
**S. CAILLIET**, M. ROUMANIE, R. LAUCOURNET, Université Grenoble-Alpes, Grenoble, France and CEA, LITEN, DTNM, SERE, LRVM, Grenoble, France; G. BERNARD-GRANGER, Université Grenoble-Alpes, Grenoble, France and CEA, DEN, MAR, DRMC, SFMA, DIR, Bagnols-sur-Cèze, France
- 10.20 **CB-9.4:L06 Development of Photo-curable Ceramic Resin with High Dispersion Stability for SLA 3D Printing Application**  
**SE YEON SONG<sup>1,2</sup>**, JUNG WOO LEE<sup>1</sup>, JI SUN YUN<sup>1</sup>, <sup>1</sup>Electronic Convergence Materials Division, Korea Institute of Ceramic Engineering and Technology, Jinju, South Korea; <sup>2</sup>Department of Materials Engineering, Pusan National University, Busan, South Korea
- 10.40 *Break*

Chair: Hiroya ABE, Japan

- 11.10 **CB-9.4:IL07 Manufacturing of Multimaterial Parts using Hybrid Additive Manufacturing Machine**  
**C. CHAPUT**, 3DCeram, Limoges, France; T. CHARTIER, SPCTS, CNRS/University of Limoges, Limoges, France
- 11.40 **CB-9.4:IL08 State of the Art in Stereolithography of Ceramics**  
**J. HOMA**, M. SCHWENTENWEIN, Lithoz GmbH, Vienna, Austria
- 12.10 **CB-9.4:L09 Development of a Numerical Simulation Model for Predicting the Curing of Ceramic Systems in the Stereolithography Process**  
**J. TARABEUX**, V. PATELOUP, P. MICHAUD, T. CHARTIER, SPCTS - UMR CNRS 7315, Limoges, France

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## THURSDAY JUNE 7 MORNING

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Room: SALA RELATORI

### Session CB-10.2 - SHS of Powders from the Micro- to Nano-scale. Consolidation of the SHS-powders

Chair: Roberto ORRU', Italy

- 9.30 CB-10.2:L05 Contribution of SHS in Development and Production of Super-refractory Ceramic Materials  
**E.A. LEVASHOV**, YU.S. POGOZHEV, V.V. KURBATKINA, I.V. IATSYUK, YU.YU. KAPLANSKII, S. VOROTILO, National University of Science and Technology "MISIS", Moscow, Russia
- 10.00 CB-10.2:L06 Selective Laser Melting of Ti-B-Si System produced by SHS  
**S.V. AYDINYAN**, L. LIU, I. HUSSAINOVA, Tallinn University of Technology, Tallinn, Estonia
- 10.20 CB-10.2:L07 MoSi<sub>2</sub> based Composites Preparation by Combustion Synthesis with Subsequent Selective Laser Sintering  
**T. MINASYAN**<sup>1</sup>, M.A. RODRIGUEZ<sup>2</sup>, LE LIU<sup>1</sup>, M. AGHAYAN<sup>1</sup>, L. KOLLO<sup>1</sup>, I. HUSSAINOVA<sup>1, 3, 4</sup>, <sup>1</sup>Tallinn University of Technology, Tallinn, Estonia; <sup>2</sup>Instituto de Ceramica y Vidrio (ICV-CSIC), Madrid, Spain; <sup>3</sup>ITMO University, St. Petersburg, Russia; <sup>4</sup>University of Illinois at Urbana-Champaign, Department of Mechanical Science and Engineering, Urbana, IL, USA

10.40 Break

### Session CB-10.3 - SHS of Bulk Materials

Chair: Zulkhair MANSUROV, Kazakhstan

- 11.10 CB-10.3:L01 Hot Shock Welding Applications for Layered Composite Consisting of Non-oxide Ceramics and Metal  
**RYUICHI TOMOSHIGE**, KANAKO SONODA, TAKUMI NAKAMURA, TAKUMA TANAKA, Sojo University, Japan; SEIICHIRO II, National Institute for Materials Science, Japan; YASUHIRO MORIZONO, National Institute of Technology, Kurume College, Japan
- 11.40 CB-10.3:L02 Recent Progress in SHS Ceramics  
**A.S. MUKASYAN**, Department of Chemical and Biomolecular Engineering, University of Notre Dame, Notre Dame, IN, USA, and National University of Science and Technology MISIS, Moscow, Russia
- 12.10 CB-10.3:L03 Shedding New Light on the Microstructure of SiBOC Based Ceramics  
**G.D. SORARU'**, University of Trento, Trento, Italy

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## THURSDAY JUNE 7 MORNING

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Room: MONTEFALCO

### Session CC-2 - Corrosion

Chair: Willy KUNZ, Germany

- 9.00 CC-2:IL01 **Silicate Deposit Induced Degradation of Thermal and Environmental Barrier Coatings: Toward Integrated Models for Accelerated Coating Design**  
D.L. POERSCHKE, University of Minnesota, Minneapolis, MN, USA
- 9.30 CC-2:IL02 **Corrosion and Oxidation of SiC Composites under High Temperature Water and Steam**  
TATSUYA HINOKI, S. KONDO, K. KAWASAKI, F. SHINODA, Kyoto University, Gokasho, Uji, Kyoto, Japan
- 10.00 CC-2:IL03 **Electrochemical Corrosion and Electrochemical Machining of Ceramics**  
M. SCHNEIDER, Fraunhofer IKTS Dresden, Dresden, Germany

10.30 Break

Chair: David POERSCHKE, USA

- 11.00 CC-2:IL05 **Progress in Gas-solid Reaction Kinetics for Non-oxide Ceramic Materials at High Temperature**  
ENHUI WANG, XINMEI HOU, KUOCHIH CHOU, State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing, Beijing, China; Collaborative Innovation Center of Steel Technology, University of Science and Technology Beijing, Beijing, China
- 11.30 CC-2:IL06 **Hot Gas Corrosion of Ceramic Materials**  
W. KUNZ, H. KLEMM, A. MICHAELIS, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany
- 12.00 CC-2:L07 **Development of Advanced Environmental Barrier Coatings at NASA**  
KANG N. LEE, B.J. HARDER, B.J. PULEO, NASA Glenn Research Center, Cleveland, OH, USA; G. COSTA, Vantage Partners, Cleveland, OH, USA
- 12.20 CC-2:IL11 **High Temperature Corrosion in Molten Salts & Molten Salts Technology: Past, Present and Future Through Coatings Technology**  
F.J. PEREZ, Universidad Complutense de Madrid, Departamento de Ciencia de los Materiales e Ingeniería Metalúrgica, Madrid, Spain

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## THURSDAY JUNE 7 MORNING

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Room: **MAGIONE B**

### **Session CE-2 - Functional Metal Oxide Nano- and Heterostructures**

Chair: Mauro EPIFANI, Italy

- 10.00 **CE-2:IL08 Back Interface Random Texturing for Enhanced Light Harvesting to Achieve High-efficiency Perovskite Solar Cells**  
**J. TOUDERT**, M. KRAMARENKO, H. ZHANG, J. OSMOND, J. MARTORELL\*, ICFO - Institut de Ciències Fotoniques, The Barcelona Institute of Science and Technology, Castelldefels, Barcelona, Spain; \*Departament de Física, Universitat Politècnica de Catalunya, Terrassa, Spain
- 10.30 **CE-2:IL09 Low-loss Rutile TiO<sub>2</sub> Films for Nanophotonic Applications**  
S. KUPRENAITE<sup>1</sup>, S. GRIESSE-NASCIMENTO<sup>2</sup>, S. MARGUERON<sup>3</sup>, C. MILLON<sup>1</sup>, D. RADDENZATI<sup>1</sup>, E. MAZUR<sup>2</sup>, **A. BARTASYTE**<sup>1</sup>, <sup>1</sup>FEMTO-ST institute, Université Bourgogne Franche-Comté, ENSMM, Besançon, France; <sup>2</sup>School of Engineering and Applied Sciences, Harvard University, Cambridge, USA; <sup>3</sup>LMOPS Laboratory, Université de Lorraine et CentraleSupélec, Metz, France
- 11.00 **CE-2:L10 Enhancement of Oxygen Reduction Reaction (ORR) Catalytic Activity on the Modified Surface of La<sub>0.6</sub>Sr<sub>0.4</sub>Co<sub>0.2</sub>Fe<sub>0.8</sub>O<sub>3-δ</sub> by Palladium Nanoparticles**  
**MI YOUNG OH**, HAN BIT KIM, TAE HO SHIN, Korea Institute of Ceramic Engineering and Technology, Jinju-si, Gyeongsangnam-do, South Korea

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## THURSDAY JUNE 7 MORNING

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Room: ORVIETO A

### Session CF-3 - Mechanical and Thermal Properties

Chair: Wei PAN, China

- 9.00 **CF-3:IL01 Modeling of Damage Evolution and Life Prediction in Fiber-reinforced Ceramic Matrix Composites under Tensile and Cyclic Loading at Elevated Temperatures in Oxidative Environments**  
**LONGBIAO LI**, Nanjing University of Aeronautics and Astronautics, Nanjing, P.R. China
- 9.30 **CF-3:IL02 Deformation Mechanisms in Transitional Metal Carbides**  
**G.B. THOMPSON**, C. SMITH, M. ROSS, XIAO-XIANG YU, N. DELEON, University of Alabama, Tuscaloosa, AL, USA; C.R. WEINBERGER, Colorado State University, Fort Collins, CO, USA
- 10.00 **CF-3:L03 Finite Element Constitutive Modeling of High-temperature Ceramics**  
**J.Y.R. RASHID**, ANATECH-SI, San Diego, CA, USA
- 10.20 Break

### Session CF-2 - Corrosion, Oxidation and Testing

Chair: Nasrin AL NASIRI, UK

- 10.50 **CF-2:IL09 High-temperature Stability of (Ti,Nb)-Al-C MAX Phases Composites in Oxidizing and Hydrogen Atmosphere**  
**T. PRIKHNA**, Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine
- 11.20 **CF-2:IL10 Laser Melting of Ultra-high Temperature Ceramics**  
**D. MANARA**, K. BOBORIDIS, D. ROBBA, M. COLOGNA, R. KONINGS, European Commission, JRC Karlsruhe, Germany
- 11.50 **CF-2:L11 UHTC Thermal Sprayed Coatings behavior under Plasma Wind Tunnel Tests**  
M. DE STEFANO FUMO, R. GARDI, CIRA, Capua, Italy; **M. TULUI**, F. ARCOBELLO VARLESE, S. LIONETTI, M. FORTUNATO, CSM, Rome, Italy
- 12.10 **CF-2:L12 Oxidation Behavior of HfB<sub>2</sub>-SiC and ZrB<sub>2</sub>-SiC Ultra-high Temperature Ceramics in Different Air Atmospheres**  
**C. PIRIOU**, O. RAPAUD, S. FOUCAUD, SPCTS-CNRS UMR 7315, Limoges, France; L. CHARPENTIER, M. BALAT-PICHELIN, PROMES-CNRS UPR 8521, Font-Romeu Odeillo, France
- 12.30 **CF-2:L13 Oxidation Performance of BN-coated SiC Syrlamic Fibers under Relevant Conditions for High-temperature Applications**  
**V. ANGELICI AVINCOLA**, E.J. OPILA, University of Virginia, Charlottesville, VA, USA
- 12.50 **CF-2:L14 Anti-oxidation Performance of a Cf/UHTC Composite with a BN Interface**  
P. MAKURUNJE, **I. SIGALAS**, School of Chemical and Metallurgical Engineering, University of the Witwatersrand, Johannesburg, South Africa and DST-NRF Centre of Excellence in Strong Materials, South Africa

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## THURSDAY JUNE 7 MORNING

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Room: ORVIETO B

### Session CG-5 - Electronic Properties, ab initio Calculations and Structural Characterization

Chair: Per PERSSON, Sweden

- 9.30 CG-5:IL01 **MXene Surface Functionalization Characterized on the Nanometer Scale using EELS in the TEM**  
**V. MAUCHAMP**, D. MAGNE, C. GARNERO, T. BILYK, P. CHARTIER, T. CABIOC'H, J. PACAUD; Institut Pprime - CNRS, Poitiers University, ISAE/ENSM S. CELERIER, IC2MP, Poitiers University, France
- 10.00 CG-5:IL02 **Understanding the Magnetic Properties of Nano-laminated Ternary Carbides, Nitrides and Borides: the Role of Neutron Scattering**  
**E.N. CASPI**, O. RIVIN, A. PESACH, NRCN, Beer-Sheva, Israel; H. SHAKED, BGU University, Beer-Sheva, Israel; A. HOSER, HZB, Berlin, Germany; R. GREGORII, MLZ, Garching, Germany; Q. TAO, J. ROSEN, Linköping University, Linköping, Sweden; S. KOTA, M.W. BARSOUM, Drexel University, Philadelphia, PA, USA
- 10.30 CG-5:IL04 **Band Structure and Fermi Surfaces of MAX Phases investigated by Angle Resolved Photoemission Spectroscopy (ARPES)**  
**TAKAHIRO ITO**, Nagoya University Synchrotron Radiation Research Center (NUSR), Nagoya University, Nagoya, Japan; T. FUJITA, Graduate School of Engineering, Nagoya University, Nagoya, Japan; D. PINEK, T. OUISSE, Université Grenoble-Alpes, CNRS, LMGP, Grenoble, France; M. NAKATAKE, Aichi Synchrotron Radiation Center, Seto, Japan; S. IDETA, K. TANAKA, Institute for Molecular Science, Okazaki, Japan

11.00 Break

Chair: Takahiro ITO, Japan

- 11.30 CG-5:IL05 **Atomically Resolved Electron Microscopy of MXenes**  
**P.O.A. PERSSON**, Linköping University, Linköping, Sweden
- 12.00 CG-5:L07 **Theoretical Study on the Intrinsic Point Defect Sinks in MAX Phases under Irradiation**  
**JIEMIN WANG**, J.Y. WANG, High-performance Ceramic Division, Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS, Shenyang, China
- 12.20 CG-5:L08 **Vacancy-ordered Mo<sub>1.33</sub>C MXene from First Principles and x-ray Photoelectron Spectroscopy**  
**H. LIND**, J. HALIM, S.I. SIMAK, J. ROSEN, Department of Physics, Chemistry, and Biology, Linköping University, Linköping, Sweden

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## THURSDAY JUNE 7 MORNING

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Room: SPOLETO B

### Session CH-4 - Tribological Thin Films and Coatings

Chair: Andrey VOEVODIN, USA

- 9.00 **CH-4:L05 Wear Resistant Thermal Spray Coatings**  
G. BOLELLI, L. LUSVARGHI, T. MANFREDINI, P. PUDDU, V. TESTA,  
Università degli Studi di Modena e Reggio Emilia, Modena, Italy
- 9.30 **CH-4:L06 Application and Limitations of Residual Stress Analysis in Wear Resistant Materials**  
M. WENZELBURGER, Federal-Mogul Powertrain, Federal-Mogul Friedberg GmbH, Friedberg, Germany
- 10.00 **CH-4:L07 High Performance Ti(C,N)-Ni<sub>3</sub>Al Cermets and Coatings**  
K. PLUCKNETT, Z. MEMARRASHIDI, M. GAIER, W.A. SPARLING,  
T.L. STEWART, Dalhousie University, Halifax, NS, Canada
- 10.20 **CH-4:L08 Tribological Characterization of Mo-Cu-N, Mo-Cu-X(X=Cr, Ni, Si)-N Coatings Using Alloy Targets**  
KYOUNG IL MOON, HAN-CHAN LEE, Korea Institute of Industrial Technology, Gyeonggi-do, South Korea
- 10.40 Break

### Session CH-5 - Smart and Multifunctional Thin Films and Coatings

Chair: Per EKLUND, Sweden

- 11.10 **CH-5:L02 Iron Boride Coatings for Wear and Corrosion Resistance Applications**  
E. MEDVEDOVSKI, Endurance Technologies, Inc., Calgary, Canada
- 11.40 **CH-5:L03 How to Improve the Oxidation Resistance of Ultra-high Temperature Ta-C Coatings: An ab initio Guided Approach**  
H. RIEDL, T. GLECHNER, N. KOUTNA, T. WOJCIK, P.H. MAYRHOFER, Institute of Materials Science and Technology, TU Wien, Wien, Austria; S. KOLOZSVARI, Plansee Composite Materials GmbH, Lechbruck am See, Germany; D. HOLEC, Department Physical Metallurgy and Materials Testing, Montanuniversität Leoben, Leoben, Austria; P. FELFER, Department of Materials Science, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
- 12.00 **CH-5:L04 HiPIMS Deposition of Ta-O-N Coatings for Water Splitting Application**  
J. CAPEK, S. BATKOVA, J. HOUSKA, R. CERSTVY, S. HAVIAR, Department of Physics and NTIS - European Centre of Excellence, University of West Bohemia, Plzen, Czech Republic; T. DUCHON, Department of Surface and Plasma Science, Charles University, Praha, Czech Republic
- 12.20 **CH-5:L05 Towards Understanding the Growth of Highly Epitaxial LaNiO<sub>3</sub> Films from a Propionate-based Solution**  
R.B. MOS, M. NASUI, T. PETRISOR Jr., M. GABOR, A. MESAROS, L. CIONTEA, T. PETRISOR, Center for Superconductivity, Spintronics and Surface Science, Technical University of Cluj-Napoca, Cluj-Napoca, Romania

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## THURSDAY JUNE 7 MORNING

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Room: MAGIONE A

### Session CI-3 - Structure and Functional, Mechanical and Thermal Properties of Porous Ceramics; Structure/Transport/Functional Properties Relationships

Chair: Yuji IWAMOTO, Japan

- 9.00 CI-3:L01 **Mechanical Properties of Porous Ceramics**  
**S. MEILLE**, Université de Lyon, INSA de Lyon, MATEIS UMR CNRS 5510, Villeurbanne, France
- 9.30 CI-3:L02 **Oxidation-bonded SiC Membrane for Water Treatment**  
**IN-HYUCK SONG**, S.Z.A. BUKHARI, J.H. HA, J.M. LEE, Korea Institute of Materials Science (KIMS), Changwon, Gyeongnam, South Korea
- 10.00 CI-3:L03 **Material Design for High Temperature Application**  
**F. RAETHER**, G. SEIFERT, Fraunhofer Center for High Temperature Materials and Design (HTL), Bayreuth, Germany

10.30 Break

### Session CI-4 - Advances in the Characterization of the Porous Structures

Chair: Friedrich RAETHER, Germany

- 11.00 CI-4:L01 **2D and 3D Imaging Characterization Techniques for Porous Ceramics**  
**G. BRUNO**, BAM, Bundesanstalt für Materialforschung und – prüfung, Berlin, Germany
- 11.30 CI-4:L02 **Characterization of Porous Ceramics via  $\mu$ CT**  
**T. FEY**, Chair of Glass and Ceramics, University Erlangen-Nürnberg, Erlangen, Germany
- 12.00 CI-4:L03 **Synthesis and Characterization of Xerogel and Aerogel Nanocomposites Based on Platinum Dispersed in Sol-gel Silica**  
**N. DELLA SANTINA MOHALLEM<sup>1</sup>**, J. BATISTA DA SILVA<sup>2</sup>, <sup>1</sup>Laboratory of Nanostructured Materials, UFMG, Brazil; <sup>2</sup>CDTN/CNEN, Brazil
- 12.20 CI-4:L04 **Environmental Remediation of Silicon Oxycarbide (SiCO) Porous Materials**  
**S. AGUIRRE-MEDEL**, P. KROLL, Chemistry and Biochemistry Department, University of Texas, Arlington, TX, USA
- 12.40 CI-4:L05 **Spatially Resolved NMR Study of Regular and Irregular Ceramic Catalysts by Thermally Polarized Gas**  
**M. MIRDRIKVAND**, W. DREHER, DFG Research Training Group MIMENIMA (Micro-, meso- and macroporous nonmetallic Materials), In-vivo-MR Group, Department of Chemistry, University of Bremen, Bremen, Germany

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## THURSDAY JUNE 7 MORNING

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Room: SPOLETO A

### Session CJ-3 - Multiferroics and Magnetoelectric Ceramics

Chair: Floriana CRACIUN, Italy

- 9.00 CJ-3:IL01 **Charged Defects and Domain Walls in Polycrystalline BiFeO<sub>3</sub>**

**T. ROJAC**, A. BENCAN, H. URSIC, B. JANCAR, M. MAKAROVIC, A. BRADESKO, B. MALIC, Jozef Stefan Inst., Ljubljana, Slovenia; G. DRAZIC, National Inst. Chemistry, Ljubljana, Slovenia; L. LIU, J.E. DANIELS, Univ. New South Wales, Sydney, Australia; D. DAMJANOVIC, Swiss Federal Inst. of Technology, Lausanne, Switzerland

- 9.30 CJ-3:IL02 **Magnetoelectricity at the Antiperovskite/Perovskite Interface**

DING-FU SHAO, T.R. PAUDEL, **E.Y. TSYMBAL**, Department of Physics and Astronomy, University of Nebraska, Lincoln, NE, USA

- 10.00 CJ-3:IL03 **Magnetic Energy Harvesting by Magnetoelectric Composite Structure for Ubiquitous Self-powered Autonomous IoT Systems**

**DAE-YONG JEONG**<sup>1</sup>, GEON-TAE HWANG<sup>2</sup>, WOON-HA YOON<sup>2</sup>, SHASHANK PRIYA<sup>3</sup>, JUNGHO RYU<sup>2</sup>, <sup>1</sup>Inha University, Incheon, South Korea; <sup>2</sup>Korea Institute of Materials Science, South Korea; <sup>3</sup>Pennsylvania State University, USA

- 10.30 CJ-3:IL04 **Cool - Spark Plasma Sintering: Exploring Fragile Ferroic Ceramics and Beyonds**

T. HERISSON DE BEAUVOIR, A. SANGREGORIO, I. CORNU, V. VILLEMET, C. ELISSALDE, D. MICHAU, U-C. CHUNG-SEU, **M. JOSSE**, ICMCB-CNRS, Université de Bordeaux, UPR 9048 CNRS, Pessac, France

- 11.00 Break

Chair: Evgeny TSYMBAL, USA

- 11.30 CJ-3:IL05 **Multiferroic (Nd,Fe)-doped PbTiO<sub>3</sub> Ceramics with Coexistent Ferroelectricity and Magnetism at Room Temperature**

**F. CRACIUN**, CNR Istituto dei Sistemi Complessi, Area della Ricerca di Roma-Tor Vergata, Rome, Italy

- 12.00 CJ-3:IL06 **Real-space Imaging of the Spin Cycloid in BiFeO<sub>3</sub> Thin Films**

V. GARCIA, K. GARCIA, C. CARRETERO, A. BARTHELEMY, M. BIBES, **S. FUSIL**, Unite Mixte de Physique, CNRS, Thales, Univ. Paris Sud, Univ. Paris-Saclay, Palaiseau, France; I. GROSS, W. AKHTAR, L.J. MARTINEZ, S. CHOUAIEB, V. JACQUES, Lab. Charles Coulomb, Univ. de Montpellier and CNRS, Montpellier, France; J.-Y. CHAULEAU, M. VIRET, SPEC, CEA, CNRS, Univ. Paris-Saclay, Gif-sur-Yvette, France; P. APPEL, P. MALETINSKY, Dept. of Physics, Univ. of Basel, Basel, Switzerland

- 12.30 CJ-3:L07 **Ferroelectric Properties of Bi(Fe,Sc)O<sub>3</sub> Ceramics Addressed by Piezoresponse Force Microscopy**

**V.V. SHVARTSMAN**, Inst. for Material Science, Univ. of Duisburg-Essen, Essen, Germany; A.N. SALAK, Dept. of Materials and Ceramic Eng./CICECO, Univ. of Aveiro, Aveiro, Portugal; D.D. KHALYAVIN, ISIS Facility, Rutherford Appleton Lab., Chilton, Didcot, UK

- 12.50 CJ-3:L08 **Complex Functional Characterization of Percolative CoFe<sub>2</sub>O<sub>4</sub>-PbTiO<sub>3</sub> Composite Ceramics**

**C.E. CIOMAGA**<sup>1</sup>, M. AIRIMIOAEI<sup>1</sup>, I. TURCAN<sup>1</sup>, A.V. LUKACS<sup>1</sup>, L. PADURARIU<sup>1</sup>, S. BALCIUNAS<sup>2</sup>, J. BANYS<sup>2</sup>, L. MITOSERIU<sup>1</sup>, <sup>1</sup>Faculty of Physics, "Al. I. Cuza" University of Iasi, Iasi, Romania; <sup>2</sup>Faculty of Physics, Vilnius University, Vilnius, Lithuania

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## THURSDAY JUNE 7 MORNING

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Room: CORCIANO

### Session CK-5 - Multiferroics and Magnetoelectric Compounds

Chair: Rafael RAMOS, Japan

- 9.30 CK-5:IL01 **Marrying Ferroelectricity and Metallicity: “It’s Complicated”**  
**V. FIORENTINI**, A. FILIPPETTI, Cagliari University, Monserrato (CA), Italy; F. RICCI, Louvain University, Belgium; A. URRU, P. DELUGAS, SISSA, Trieste, Italy; J. INIGUEZ, H.J. ZHAO, LIST, Luxembourg; E. CANADELL, ICMAB, Spain; L. BELLAICHE, University of Arkansas, USA
- 10.00 CK-5:L03 **Nanopillars with E-field Accessible Multi-state ( $N \geq 4$ ) Magnetization with Giant Magnetization Changes in Self-assembled BiFeO<sub>3</sub>-CoFe<sub>2</sub>O<sub>4</sub>/Pb(Mg<sub>1/3</sub>Nb<sub>2/3</sub>)-38at%PbTiO<sub>3</sub> Heterostructures**  
XIAO TANG, JIEFANG LI, **D. VIEHLAND**, Dept. of Materials Science and Engineering, Virginia Tech, Blacksburg, VA, USA
- 10.20 CK-5:L05 **Origin of High Magnetoelectric Coupling in Multiferroic BiFeO<sub>3</sub>-BaTiO<sub>3</sub> Superlattices**  
**M. LORENZI**<sup>1</sup>, V. LAZENKA<sup>2</sup>, C. PATZIG<sup>3</sup>, S. SELLE<sup>3</sup>, D. HIRSCH<sup>4</sup>, T. HÖCHE<sup>3</sup>, K. TEMST<sup>2</sup>, M. GRUNDMANN<sup>1</sup>, <sup>1</sup>Universität Leipzig, Felix-Bloch-Institut für Festkörperphysik, Semiconductor Physics Group, Leipzig, Germany; <sup>2</sup>KU Leuven, Instituut voor Kern- en Stralingsfysica, Leuven, Belgium; <sup>3</sup>Fraunhofer-Institut für Mikrostruktur von Werkstoffen und Systemen, Center for Applied Microstructure Diagnostics, Halle, Germany; <sup>4</sup>Leibniz-Institut für Oberflächenmodifizierung e.V., Physikalische Abteilung, Leipzig, Germany

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## THURSDAY JUNE 7 MORNING

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Room: NORCIA

### Session CL-4 - Laser Materials

Chair: Angela SEDDON, UK

- 9.00 **CL-4:L04 Vision for Advanced Laser Materials**  
**J. BALLATO**, M. CAVILLON, P.D. DRAGIC, Clemson University, Clemson, SC, USA; University of Illinois at Urbana-Champaign, Urbana, IL, USA
- 9.30 **CL-4:L05 Mid-infrared Transition Metal Doped Chalcogenide Laser Materials and Lasers**  
**S.B. MIROV**<sup>1,2</sup>, I.S. MOSKALEV<sup>2</sup>, M.S. MIROV<sup>2</sup>, S. VASILYEV<sup>2</sup>, V.V. FEDOROV<sup>1,2</sup>, D.V. MARTYSHKIN<sup>1,2</sup>, O. GAFAROV<sup>1</sup>, V. SMOLSKI<sup>2</sup>, <sup>1</sup>Center for Optical Sensors and Spectroscopies and Dept. of Physics, Univ. of Alabama at Birmingham, Birmingham, AL, USA; <sup>2</sup>IPG Photonics Corp., Southeast Technology Center, Birmingham, AL, USA
- 10.00 **CL-4:L06 Recent Progress on Fabrication of Rare-earth Doped Sesquioxide Laser Ceramics**  
J. WANG<sup>1,2</sup>, D.L. YIN<sup>1</sup>, P. LIU<sup>2</sup>, J. MA<sup>1,2</sup>, Z.L. DONG<sup>3</sup>, L.B. KONG<sup>3</sup>, **DINGYUAN TANG**<sup>1,2</sup>, <sup>1</sup>School of Electrical and Electronic Eng., Nanyang Technological University, Singapore; <sup>2</sup>Jiangsu Key Lab. of Advanced Laser Materials and Devices, Jiangsu Normal University, China; <sup>3</sup>School of Materials Science and Eng., Nanyang Technological University, Singapore
- 10.20 **CL-4:L07 Nd<sup>3+</sup>-doped Lu<sub>2</sub>O<sub>3</sub> Laser Materials as Ceramics (SPS, HIP) and Single Crystals ( $\mu$ -Pulling Down). Spectroscopic Properties and Comparison of Laser Outputs**  
**G. BOULON**, G. ALOMBERT-GOGET, Y. GUYOT, Institute Light Matter, UMR5306 CNRS, UCB Lyon1, University of Lyon, Villeurbanne, France; M. GUZIK, Faculty of Chemistry, University of Wroclaw, Poland; J. PEJCHAL, A. YOSHIKAWA, A. ITO, T. GOTO, Institute for Materials Research, Tohoku University, Sendai, Japan; A. IKESUE, World Lab. Co., Ltd., Nagoya, Japan; G. TOCI, National Institute of Optics, NRC, INO-CNR, Sesto Fiorentino, Italy
- 10.40 **CL-4:L08 Effect of Gd<sup>3+</sup> on Yb<sup>3+</sup> Emission in Gd Admixed Yb:YAG at Cryogenic Temperature**  
**S.P. DAVID**, V. JAMBUNATHAN, F. YUE, P. NAVRATIL, M. MIKA; A. LUCIANETTI, T. MOCEK, HiLASE Centre, Institute of Physics CAS, Dolní Brežany, Czech Rep.; Dept. of Glass and Ceramics, University of Chemistry and Technology, Prague, Prague, Czech Rep.
- 11.00 Break

### Session CL-5 - Inorganic Optical Fibers

Chair: Sergey MIROV, USA

- 11.30 **CL-5:L01 Optical Fiber Materials and Process Innovations for Next Generation Telecommunication Systems**  
**P. TANDON**, Corning Inc., Corning, NY, USA
- 12.00 **CL-5:L02 Shining a Light on Disease with Mid-infrared Fibreoptics**  
**A.B. SEDDON**, Ł. SOJKA, T.M. BENSON, D. FURNISS, Z.Q. TANG, H. PARRELL, D. JAYASURIYA, Y. FANG, M. SHEN, S. SUJECKI, Mid-Infrared Photonics Group, George Green Inst. for Electromagnetics Research, University of Nottingham, Nottingham, UK
- 12.30 **CL-5:L04 Composite Material Optical Fibres - Functionalisation with Semiconductors and 2D Materials**  
**P.J.A. SAZIO**, A. LEWIS, F. DE LUCIA, W. BELARDI, F. POLETTI, C.C. HUANG, D. HEWAK, ORC, University of Southampton, UK; V. GOPALAN, J.V. BADDING, Dept. of Chemistry and Materials Research Institute, Pennsylvania State Univ., State College, PA, USA

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## THURSDAY JUNE 7 MORNING

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Room: **CASCIA**

### **Session CM-4 - Innovative Processing in Silicate Ceramics**

Chair: Paolo ZANNINI, Italy

**9.30 CM-4:IL01 Chemical Tempering of Porcelain Tiles**

**D. HOTZA**<sup>1</sup>, M. DAL BO<sup>2</sup>, <sup>1</sup>Department of Chemical Engineering (EQA), Federal University of Santa Catarina (UFSC), Florianópolis, SC, Brazil; <sup>2</sup>Federal Institute of Education, Science and Technology of Santa Catarina (IFSC), Campus Criciúma, Criciúma, SC, Brazil

**10.00 CM-4:IL04 Traditional Raw Materials as Active Components in Biocleaning Desalination Processes**

**S. VUCETIC**<sup>1</sup>, **J. RANO GAIJC**<sup>1</sup>, **H. HIRSENBERGER**<sup>2</sup>, **A. VIDAKOVIC**<sup>1</sup>, **S. MARKOVIC**<sup>1</sup>, <sup>1</sup>University of Novi Sad, Faculty of Technology, Novi Sad, Serbia; <sup>2</sup>University of Novi Sad, Faculty of Technical Science, Novi Sad, Serbia

**10.30 Break**

### **Session CM-5 - Geopolymers**

Chair: Ameni GHARZOUNI, France

**11.00 CM-5:IL01 Working Mechanisms of Superplasticizers on Alkali-Activated Cements**

**M. PALACIOS**<sup>1</sup>, **P. BOWEN**<sup>2</sup>, **F. PUERTAS**<sup>1</sup>, <sup>1</sup>Eduardo Torroja Institute for Construction Science (IETcc-CSIC), Madrid, Spain; <sup>2</sup>École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

**11.30 CM-5:L03 Thermal Resistant Alkali-activated Materials Based on Various Aluminosilicate Sources**

**M. FRICHETEAU**, **A. GHARZOUNI**, **S. ROSSIGNOL**, Science des Procédés Céramiques et de Traitements de Surface (SPCTS), Limoges Cedex, France

**11.50 CM-5:L04 Mechanical and Thermal Properties of Fly Ash Based Geopolymer Composites**

**P. TIMAKUL**, **P. HENPRASIRTAE**, **DUANGDUEN ATONG**, **PAVADEE AUNGKAVATTANA**, National Metal and Materials Technology Center and National Nanotechnology Center, Klong Luang, Pathumthani, Thailand

**12.10 CM-5:IL09 Alkali Activated Green Building Materials - Selected Case Studies**

**V. DUCMAN**, Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia

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## THURSDAY JUNE 7 MORNING

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Room: BEVAGNA

Chair: Victor C. PANDOLFELLI, Brazil

### Session CN-6 - Refractory Materials for Novel or Advanced Applications

- 9.00 CN-6:IL01 **Innovative Sintered Mullite-zirconia Refractory Composite for Hazardous Waste Incinerators**  
A. VILLALBA WEINBERG<sup>1, 2, 5</sup>, M.L. BOUCHETOU<sup>1</sup>, E.S. FOTSO, O. JOUBERT<sup>4</sup>, C. VARONA<sup>5</sup>, D. GOEURIOU<sup>2</sup>, J. POIRIER<sup>1</sup>, <sup>1</sup>CNRS, CEMHTI UPR 3079, Univ. Orléans, Orléans, France; <sup>2</sup>LGF CNRS UMR 5307, Mines Saint-Etienne, France; <sup>3</sup>CARRD, Imerys, Villach, Austria; <sup>4</sup>Imerys Refractory Minerals Clerac; <sup>5</sup>Bony SA, Saint Etienne, France
- 9.30 CN-6:IL02 **Enhanced Mechanical Properties of Al<sub>2</sub>O<sub>3</sub>-C Refractories with Silicon Hybridized Expanded Graphite**  
Yawei Li, The State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science & Technology, Wuhan, P.R. China
- 10.00 CN-6:L03 **Reactive Filter Collectors Based on Calcium Aluminates with Carbon for Clean Steel Approaches**  
E. STORTI, D. VERES, M. FARHANI, C.G. ANEZIRIS, Institute of Ceramic, Glass and Construction Materials, TU Freiberg, Freiberg, Germany; C. WÖHRMEYER, Kerneos GmbH, Oberhausen, Germany; C. PARR, Kerneos SA, Puteaux, France

### Session CN-1 - Raw Materials Needs

- 10.20 CN-1:IL02 **Raw Material Needs for Modern Clean Steel Technology and Refractories Engineering**  
A. BUHR, Almatis GmbH, Frankfurt, Germany; R. BRUCKHAUS, Dillingen, Dillingen, Germany; R. FANDRICH, Stahlinstitut VDEh, Düsseldorf, Germany
- 10.50 Break

Chair: Michel RIGAUD, Canada

### Session CN-4 - Modelling and Simulation of the Process Environment

- 11.20 CN-4:IL05 **Thermodynamic Database for the Slag and Refractory System in the Coal Combustion Process**  
IN-HO JUNG, M.-A. VAN ENDE, Dept. of Mats Science and Tech., Seoul National University, Seoul, South Korea; DONG-GEUN KIM, E. MOOSAVI-KHOONSARI, Dept. of Mining and Materials Eng., McGill University, Montreal, QC, Canada; MINAMI TAI, RCCM, Tokyo, Japan

### Session CN-5 - Refractory Failure Analysis

- 11.50 CN-5:IL05 **An European Innovative Training Network dedicated to Refractories: ATHOR**  
M. HUGER, University of Limoges, UMR CNRS 7315 - IRCER, Centre Européen de la Ceramique, Limoges, France
- 12.20 CN-5:L06 **Autopsy of Refractory Lining in Anode Baking Furnaces with Open and Closed Design**  
T. BRANDVIK, T. GRANDE, NTNU Norwegian University of Science and Technology, Trondheim, Norway; A.P. RATVIK, SINTEF Materials and Chemistry, Trondheim, Norway

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## THURSDAY JUNE 7 MORNING

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Room: SPELLO

### Session CO-3 - Processing and Fabrication of MMCS, CMCS, and C/C Composites

Chair: Zhengyi FU, China

- 9.00 CO-3:IL04 Additive Manufacturing of Ceramics and Composites  
**TATSUKI OHJI**, NAOKI KONDO, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan
- 9.30 CO-3:IL05 New Approaches for the Manufacture of C/C-SiC Composite Materials  
**W. KRENKEL**, N. LANGHOF, Ceramic Materials Engineering, University of Bayreuth, Bayreuth, Germany
- 10.00 CO-3:IL06 Rapid Densification of CMCs by Controlling the Multi-scale Pores in CVI Process  
**LAIFEI CHENG**, Science and Technology on Thermostructural Composite Materials Laboratory, Northwestern Polytechnical University, Xi'an, China
- 10.30 Break

### Session CO-7 - Applications

Chair: Tatsuki OHJI, Japan

- 11.00 CO-7:IL01 Ceramic Composites for Space Structures  
**M. KROEDEL**, ECM Engineered Ceramic Materials GmbH, Moosinning, Germany
- 11.30 CO-7:IL03 Ceramic Composites for Industrial High Temperature Applications  
**R. WEISS**, Schunk Kohlenstofftechnik GmbH, Heuchelheim, Germany
- 12.00 CO-7:IL04 SiC/SiC for Fuel Cladding and Other Nuclear Applications  
**C. SAUDER**, J. BRAUN, C. LORRETTE, CEA Saclay, DEN/DMN, Gif sur Yvette, France

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## THURSDAY JUNE 7 AFTERNOON

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Room: ASSISI A

### Session CA-4 - Sintering

Chair: Willi PABST, Czech Republic

14.30 CA-4:L05 **Comparison of Hot Pressing and Pulsed Electric Current Sintering of ED Machinable Ceramics**

**F. KERN**, U. SCHMITT-RADLOFF, A. GOMMERINGER, R. GADOW,  
Universität Stuttgart - IFKB, Stuttgart, Germany

15.00 CA-4:L06 **Analysis of Densification Kinetics Depending on Grain Growth for Zirconia**

**BYUNG-NAM KIM**, KOJI MORITA, HIDEHIRO YOSHIDA, JI-GUANG LI, National Institute for Materials Science, Japan; HIDEAKI MATSUBARA, Tohoku University, Japan

15.20 Break

Chair: Jerome CHEVALIER, France

15.50 CA-4:L07 **Sintering of Tailored Pore-Grain Structures: Multi-Scale Analysis**

**E.A. OLEVSKY**, San Diego State University, San Diego, CA, USA

16.20 CA-4:L09 **Two-Step Sintering Effects on the Properties of Pressureless-Sintered Ceramics**

**F. MAZZANTI**, F. BEZZI, P. FABBRI, S. GRILLI, G. MAGNANI, E. SALERNITANO, M. SCAFÈ, ENEA SSPT-PROMAS-TEMAF, Laboratory of Materials Technologies Faenza, Faenza (RA), Italy

### Session CA-5 - Innovation in Manufacturing Technology

16.40 CA-5:L05 **Machining Techniques to Prepare Complicated Shape Parts with Extremely Fine Details**

**F. PETIT**, Belgian Ceramic Research Centre, Mons, Belgium

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## THURSDAY JUNE 7 AFTERNOON

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Room: ASSISI B

### Session CB-5 - Functionally Graded Materials

Chair: Alexandre MAITRE, France

- 14.30 CB-5:IL01 **Metal-ceramics Functionally Graded Materials**  
**YOSHIMI WATANABE**, Nagoya Institute of Technology, Nagoya, Japan
- 15.00 CB-5:IL02 **MAX Phase Reinforced SiC/SiC Composites**  
**XIAOWEI YIN**, LAIFEI CHENG, LITONG ZHANG, Northwestern Polytechnical University, Xi'an, China
- 15.30 CB-5:L03 **Analysis of FGM Beam Model for Thermal Stability Behavior with Heat Conduction Effect**  
YOUNG-HOON LEE, TAE-KYUNG LIM, **JI-HWAN KIM**, Department Mechanical and Aerospace Engineering, College of Engineering, Seoul National University, Seoul, South Korea

15.50 Break

### Session CB-4 - Electrical Field and Pressure Assisted Synthesis and Sintering

Chair: Claude ESTOURNES, France

- 16.10 CB-4:IL08 **High Pressure Synthesis and Crystal Growth of BN and Related Materials**  
**TAKASHI TANIGUCHI**, National Inst. for Materials Science, Tsukuba, Japan
- 16.40 CB-4:L09 **Effect of DC Current on Creep behavior of 8Y-ZrO<sub>2</sub>**  
**KOJI MORITA**, BYUNG-NAM KIM, HIDEHIRO YOSHIDA, KEIJIRO HIRAGA, YOSHIO SAKKA, National Institute for Materials Science, Tsukuba, Japan

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## THURSDAY JUNE 7 AFTERNOON

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*Continued from preceding page*

*Room: ASSISI B*

### **Session CB-9.5 - Direct Writing**

*Chair: Johannes HOMA, Austria*

- 17.10 **CB-9.5:L01 Solvent-free Direct Deposition of Ceramic Components for Energy Application**  
**HIROYA ABE**, Osaka University, Ibaraki, Japan
- 17.40 **CB-9.5:L02 Aerosol Jet® Technology for Printed Electronic Devices Comprising Ceramics**  
**M.A. PIECHOWIAK<sup>1</sup>**, G. ETCHEGOYEN<sup>1</sup>, A. DELAGE<sup>2</sup>, N. DELHOTE<sup>2</sup>, A. ABDELGHANI<sup>2</sup>, <sup>1</sup>Centre de Transfert de Technologies Céramiques (CTTC), Limoges Cedex, France; <sup>2</sup>Laboratoire XLIM - UMR CNRS 7252 - Université de Limoges, Limoges Cedex, France
- 18.00 **CB-9.5:L03 Direct 3D Printing of Aluminum Nitride Using Ovalbumin As The Natural Binder**  
**WAI HOONG KOK<sup>1</sup>**, K.C. YUNG<sup>1</sup>, T.C. ANG<sup>2</sup>, <sup>1</sup>Department of Industrial and Systems Engineering, Faculty of Engineering, The Hong Kong Polytechnic University, Hong Kong; <sup>2</sup>School of Material Science, Nanyang Technolgy University, Singapore

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## **THURSDAY JUNE 7 AFTERNOON**

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*Room:* **SALA RELATORI**

### **Session CB-10.4 - Solution Combustion Synthesis of Ceramic Nanopowders and Materials, and Applications**

*Chair:* Alexander MUKASYAN, Russia

- 16.50 **CB-10.4:IL01 Product Structure Formation in SCS Processes**  
**G. XANTHOPOULOU**, Institute of Nanoscience and Nanotechnology, NCSR "Demokritos", Athens, Greece
- 17.20 **CB-10.4:IL02 Solution Combustion Synthesis of Nanomaterials for Various Applications**  
**Z.A. MANSUROV**, G.T. SMAGULOVA, Institute of Combustion Problems, Kazakhstan, Almaty Al-Farabi Kazakh National University, Almaty, Kazakhstan
- 17.50 **CB-10.4:IL03 Branding Study on SHS Technologies toward Efficient In-situ Resource Utilization Scenario**  
**OSAMU ODAWARA**, PROSAP Inc., Tokyo, Japan

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## THURSDAY JUNE 7 AFTERNOON

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Room: MONTEFALCO

### Session CC-2 - Corrosion

Chair: Michael SCHNEIDER, Germany

- 14.30 CC-2:IL08 **High Temperature Ceramic Materials for Space Applications**  
**M. BALAT-PICHELIN**, PROMES-CNRS Laboratory, Font-Romeu Odeillo, France
- 15.00 CC-2:IL09 **Preparation and Oxidation Resistance of ZrB<sub>2</sub>-SiC Composite Powders by Molten-salt-mediated Magnesio-thermic Reduction Synthesis**  
**HAIJUN ZHANG**, The State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science and Technology, Wuhan, China
- 15.30 CC-2:L10 **Elastomer Seal Corrosion Protection using DLC-Ag Film**  
T. BAESSO<sup>1</sup>, A.C. SENE<sup>1</sup>, L.A. MANFROI, A.A. VIEIRA<sup>1</sup>, P.A. RADI<sup>1,2</sup>, M.A. RAMIREZ<sup>1</sup>, T.C.A. SANTOS<sup>1</sup>, **L. VIEIRA<sup>1, 2</sup>**, <sup>1</sup>University of Paraiba Valley- UNIVAP/ IP&D, Sao José dos Campos, SP-Brazil; <sup>2</sup>Aeronautics Institute of Technology, ITA / LPP, Sao José dos Campos, SP-Brazil

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## THURSDAY JUNE 7 AFTERNOON

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Room: **MAGIONE B**

### **Session CE-3 - Functional Materials and Sustainability**

Chair: Alberto VOMIERO, Sweden

- 14.30 **CE-3:IL02 Organic-inorganic Hybrid Aerogels and Xerogels with High Strength and Flexibility**  
**KAZUYOSHI KANAMORI**, Department of Chemistry, Graduate School of Science, Kyoto University, Japan
- 15.00 **CE-3:IL03 Li-ion Conductor for Future Energy Storage**  
**LI LU**, National University of Singapore National University of Singapore Suzhou Research Institute, Singapore
- 15.30 **CE-3:IL04 High Conversion Efficiency Materials for Thermoelectric Applications**  
**W. WONG-NG**, C. BROWN, J. MARTIN, Q. HUANG, National Institute of Standards and Technology, Gaithersburg, MD, USA; Y. YAN, Wuhan University of Technology, Wuhan, China; Y.C. LAN, Morgan State University, Baltimore, MD, USA; Z.F. REN, University of Houston, Houston, TX, USA
- 16.00 **CE-3:L05 Nano-catalyst Infiltration Enhancement of Porous Solid Oxide Fuel Cell Electrodes Using Catechol Surfactants**  
O. OZMEN, K. SABOLSKY, J.W. ZONDLO, **E.M. SABOLSKY**, West Virginia University, Morgantown, WV, USA; S. LEE, G. HACKETT, H. ABERNATHY, US Department of Energy, National Energy Technology Laboratory, Morgantown, WV, USA

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## THURSDAY JUNE 7 AFTERNOON

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Room: ORVIETO A

### Session CF-3 - Mechanical and Thermal Properties

Chair: Gregory THOMPSON, USA

14.30 **CF-3:IL04 Making Porous UHTC's for Transpiration Cooling of Components**

L.J. VANDEPERRE, D. GLYMOND, L. LARRIMBE, W.E. LEE, Centre for Advanced Structural Ceramics & Dept. of Materials, Imperial College London, South Kensington Campus, London, UK

15.00 **CF-3:IL05 Defect Engineering in Development of Low Thermal Conductivity Materials**

WEI PAN, MENG ZHAO, XIAORUI REN, JUN YANG, CHUNLEI WAN, ZHIXUE QU, JING FENG, State Key Lab of New Ceramics and Fine Processing, School of Matls Sci. and Eng., Tsinghua University, Beijing, China

15.30 **CF-3:L06 On the Non-linear Young's Modulus Behavior of Carbon-bonded Materials at High Temperatures**

B. LUCHINI, J. GRABENHORST, J. FRUHSTORFER, C.G. ANEZIRIS, IKGB, TU-Bergakademie Freiberg, Freiberg, Sachsen, Germany; V.C. PANDOLFELLI, GEMM, UFSCar, São Carlos, SP, Brazil

15.50 **CF-3:L07 Effect of Microstructural Features of SPSed Boron Carbide Ceramics on their Mechanical Properties**

L. ROUMIGUIER, A. JANKOWIAK, DEN-Service de Recherches Metallurgiques Appliquées, CEA, Université Paris-Saclay, Gif-sur-Yvette, France; N. PRADEILLES, G. ANTOU, A. MAITRE, SPCTS, UMR CNRS 7315, Limoges, France

16.10 Break

Chair: Longbiao LI, China

16.30 **CF-3:L08 Aluminum-dodecaboride- and Boroncarbide-based Lightweight Ceramics**

T.A. PRIKHNA<sup>1</sup>, P.P. BARVITSKIY<sup>1</sup>, V.B. MURATOV<sup>2</sup>, S.N. DUB<sup>1</sup>, V. DOMNICH<sup>3</sup>, M.V. KARPETS<sup>1</sup>, R. HABER<sup>3</sup>, <sup>1</sup>Institute for Superhard Materials, NAS Ukraine, Kiev, Ukraine; <sup>2</sup>Institute for Problems in Material Science, NAS Ukraine, Kiev, Ukraine; <sup>3</sup>Dept. of Materials Sci. and Eng., Rutgers, The State Univ. of New Jersey, Piscataway, NJ, USA

16.50 **CF-3:L09 Thermo-mechanical Behaviour of Carbon-carbon Composite**

T. VOIRIN, P. REYNAUD, G. FANTOZZI, University of Lyon, INSA Lyon, MATEIS, Villeurbanne, France

17.10 **CF-3:L10 Spark Plasma Sintering and Mechanical Characterization of Titanium Nitride Ceramics**

B.M. MOSHTAGHIOUN, D. GOMEZ GARCIA, A. DOMINGUEZ RODRIGUEZ, Dept. of Condensed Matter Physics, University of Seville, Spain

17.30 **CF-3:L11 On the Thermal Properties of Celsian Ba/SrAl<sub>2</sub>Si<sub>2</sub>O<sub>8</sub> Ceramics: Theoretical and Experimental Study**

LUCHAO SUN, J.Y. WANG, Shenyang National Laboratory for Materials Science; Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China

17.50 **CF-3:L12 XFEM Investigations of Double Torsion Fracture Test**

K.P. MARIMUTHU, K. LEE, H. LEE, Sogang University, Seoul, South Korea

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## THURSDAY JUNE 7 AFTERNOON

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Room: **MAGIONE B**

### **Session CG-6 - Synthesis and Fabrication of MAX/MAB/MXenes**

Chair: Micah J. GREEN, USA

14.30 CG-6:L01 **2D Atomic Sandwiches of Ordered Double-transition Metal Carbides (MXenes)**

**B. ANASORI**, Y. GOGOTSI, A.J. Drexel Nanomaterials Institute and Department of Materials Science & Engineering, Drexel University, Philadelphia, PA, USA

15.00 CG-6:L02 **MAX Phase Thin Film Synthesis by Annealing Techniques**

**T. CABIOC'H**, D. MAGNE, V. MAUCHAMP, J. NICOLAI, M.F. BEAUFORT, Département de Physique et Mécanique des Matériaux, Institut P', University of Poitiers-CNRS-ENSMA, Chasseneuil-Futuroscope, France

15.30 *Break*

Chair: Thierry CABIOC'H, France

16.00 CG-6:L03 **MXene Electrochemical Etching and Morphology Alteration**

WANMEI SUN, SMIT SHAH, TOUSEEF HABIB, M. RADOVIC, **M.J. GREEN**, A. McFERRIN, Dept. of Chemical Engineering, Dept. of Materials Science & Engineering, Texas A&M University, College Station, TX, USA

16.30 CG-6:L04 **Self-propagating High-temperature Synthesis and Properties of the MAX Phases in Ti-Al-C System**

**A. PAZNIAK**, D. KUZNETSOV, NUST "MISiS", Moscow, Russia, P. BAZHIN, A. STOLIN, ISMAN, Chernogolovka, Russia

16.50 CG-6:L05 **Synthesis of MAX Phases by Molten Salt Shielded Synthesis Process in Air**

**A. DASH**, O. GUILLON, R. VASSEN, J. GONZALEZ-JULIAN, IEK-1, Forschungszentrum Jülich GmbH, Jülich, Germany

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## THURSDAY JUNE 7 AFTERNOON

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Room: SPOLETO B

### Session CH-5 - Smart and Multifunctional Thin Films and Coatings

Chair: Eugene MEDVEDOVSKI, Canada

- 14.30 **CH-5:IL06 Photochromic Properties of Thin Films of Oxidized Yttrium Hydride**

**S.Zh. KARAZHANOV<sup>1</sup>, J. MONTERO<sup>1</sup>, D. MOLDAREV<sup>1, 2</sup>, A. TABATABAEI<sup>3</sup>, E. MURAT BABA<sup>3</sup>, E. STRUGOVSHCHIKOV<sup>4</sup>, CH.CH. YOU<sup>1</sup>, A. PISHTSHEV<sup>4</sup>, D. PRIMETZHOFER<sup>2</sup>, H. PALONEN<sup>2</sup>, M. WOLFF<sup>2</sup>, E.O. ZAYIM<sup>3</sup>, E.S. MARSTEIN<sup>1</sup>,** <sup>1</sup>Department for Solar Energy, Institute for Energy Technology, Kjeller, Norway; <sup>2</sup>Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden; <sup>3</sup>Istanbul Technical University, Istanbul, Turkey; <sup>4</sup>Institute of Physics, University of Tartu, Tartu, Estonia

- 15.00 **CH-5:IL07 Antifouling Coatings: Adhesion Mechanisms of Micro-organisms**

**C. TENDERØ, CIRIMAT / INPT-ENSIACET, Toulouse, France**

- 15.30 *Break*

Chair: Claire TENDERØ, France

- 16.00 **CH-5:IL08 Novel Ceramic and Layered Thin-film Materials for Contacts and Thermoelectric Applications**

**P. EKLUND**, Energy Materials Group, Thin Film Physics Division, Dept. of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden

- 16.30 **CH-5:L09 Superhydrophilic Coatings: Study and Improvement of the Sol-Spray Fabrication of ZnO-Based Self-Cleaning Ceramic Surfaces**

**F.D. RODRIGUEZ-VILLALOBOS<sup>1</sup>, J.J. RUIZ-VALDES<sup>1</sup>, V. BARBIERI<sup>2</sup>, C. SILIGARDI<sup>2</sup>, E.I. CEDILLO-GONZALEZ<sup>1</sup>,** <sup>1</sup>Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., México; <sup>2</sup>Università degli Studi di Modena e Reggio Emilia, Dipartimento di Ingegneria “Enzo Ferrari”, Modena, Italy

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## THURSDAY JUNE 7 AFTERNOON

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Room: MAGIONE A

### Session CI-5 - Modeling and Simulation of Porous Structure and Properties

Chair: Tobias FEY, Germany

14.30 **CI-5:IL01 Modelling of the Thermal Properties of Porous Ceramics: From Green to Fired Bodies**

**D.S. SMITH**, B. NAIT-ALI, S. OUMMADI, F. PUECH, D. NOUGUIER, A. ALZINA, Institute of Research for Ceramics (CNRS UMR 7315), University of Limoges, Limoges, France

15.00 **CI-5:IL02 Modelling of Porous Ceramics Produced by Additive Manufacturing**

**A. ORTONA**, SUPSI, Manno, Switzerland

15.30 **CI-5:IL03 Modeling and Simulation of Porous Materials with Microstructures of Triply Periodic Minimal Surfaces**

**R. ABU AL-RUB<sup>1</sup>**, O. AL-KETAN<sup>1</sup>, DONG-WOOK LEE<sup>1</sup>, ALIA ABU ALI<sup>1</sup>, R. REZGUI<sup>2</sup>, R. ROWSHAN<sup>3</sup>, <sup>1</sup>Masdar Institute, Khalifa University of Science and Technology, Abu Dhabi, UAE; <sup>2</sup>Core Technology Platforms, New York University Abu Dhabi, Abu Dhabi, UAE

16.00 Break

### Session CI-3 - Structure and Functional, Mechanical and Thermal Properties of Porous Ceramics; Structure/Transport/Functional Properties Relationships

Chair: Alberto ORTONA, Switzerland

16.30 **CI-3:IL04 Hydrogen-selective Si-based Inorganic-organic Hybrid Membranes for Solar Hydrogen Production via Photoelectrochemical Water-splitting**

**YUJI IWAMOTO**, Nagoya Institute of Technology, Nagoya, Japan

17.00 **CI-3:IL05 Aerogel Based Composites for Applications in Energy Technologies**

G. REICHENAUER, **C. SCHERDEL**, ZAE Bayern, Wuerzburg, Germany

17.20 **CI-3:IL07 Impact of Illite Clay and Sintering Conditions on Development of Porous Cordierite Ceramics**

M. RUNDANS, G. SEDMALE, **L. GRASE**, Riga Technical University, Institute of Silicate Materials, Riga, Latvia; K. BALTAKYS, Kaunas University of Technology, Faculty of Chemical Technology, Department of Silicate Technology, Kaunas, Lithuania

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## THURSDAY JUNE 7 AFTERNOON

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Room: **SPOLETO A**

### **Session CJ-4 - Semiconducting Ceramics**

Chair: Olga A. SHILOVA, Russia

**14.30 CJ-4:IL01 Gas Sensing with Semiconducting Metal Oxide Nanostructures**

**TETSUYA KIDA**, Division of Materials Science, Faculty of Advanced Science and Technology, Kumamoto University, Kumamoto, Japan

**15.00 CJ-4:IL02 Mechanically Tuned Conductivity in Piezoelectric Semiconductors**

**N. NOVAK<sup>1,2</sup>**, T. FRÖMLING<sup>1</sup>, J. RÖDEL<sup>1</sup>, <sup>1</sup>Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany; <sup>2</sup>Institute Jožef Stefan, Ljubljana, Slovenia

**15.30 CJ-4:IL03 Highly Sensitive and Selective Hydrogen Sensing Utilizing an Interface between Noble Metal and Anodized Titania**

**TAKEO HYODO**, Y. SHIMIZU, Graduate School of Engineering, Nagasaki University, Nagasaki, Japan

**16.00 Break**

Chair: Tetsuya KIDA, Japan

**16.30 CJ-4:IL04 Nanostructural Metal Oxide and Chalcogenide Semiconductor Gas Sensors**

**CHONG-YUN KANG**, Korea Institute of Science and Technology, Seoul, South Korea

**17.00 CJ-4:IL05 MEMS Gas Sensors Based on Metal Oxide Nano Particles**

**KENGO SHIMANOE<sup>1</sup>**, W. HARANO<sup>2</sup>, T. OHYAMA<sup>2</sup>, K. SUEMATSU<sup>1</sup>, K. WATANABE<sup>1</sup>, M. NISHIBORI<sup>1</sup>, <sup>1</sup>Faculty of Engineering Sciences, Kyushu University, Fukuoka, Japan; <sup>2</sup>Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Kasuga, Fukuoka, Japan

**17.30 CJ-4:IL06 Sol-gel Coatings for Sensing Devices and Electronics Applications**

**O.A. SHILOVA**, Institute of Silicate Chemistry, Russian Academy of Sciences, Saint-Petersburg, Russia

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## THURSDAY JUNE 7 AFTERNOON

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*Room:* CORCIANO

### **Session CK-6 - Coexistence of Superconductivity and Magnetism**

*Chair:* Frank LECHERMANN, Germany

- 14.30 CK-6:IL01 **Superconducting Properties of Ultrathin FeSe Films on Oxide Substrates**

**TSUTOMU NOJIMA**, J. SHIOGAI, T. MIYAKAWA, Y. ITO, T. HARADA, A. TSUKAZAKI, Institute for Materials Research, Tohoku University, Sendai, Japan

- 15.00 CK-6:IL02 **Novel Proximity Phenomena at High Tc Superconductor Interfaces**

D. SANCHEZ-MANZANO<sup>1</sup>, M. ROCCI<sup>1</sup>, F.A. CUELLAR<sup>1</sup>, M. VARELA<sup>1</sup>, Z. SEFRIOUT<sup>1</sup>, C. LEON<sup>1</sup>, J. TRASTOY<sup>2</sup>, X. PALERMO<sup>2</sup>, V. ROUCO<sup>2</sup>, J. VILLEGRAS<sup>2</sup>, M. GARCIA HERNANDEZ<sup>3</sup>, Q. WANG<sup>4</sup>, Y.H. LIU<sup>4</sup>, S.G.E. TE VELTHUIS<sup>4</sup>, M.R. FITZSIMMONS<sup>5</sup>, **J. SANTAMARIA**<sup>1</sup>, <sup>1</sup>GFMC, Depto. Física de Materiales, Universidad Complutense de Madrid, Madrid, Spain; <sup>2</sup>Unité Mixte de Physique CNRS/Thales, Campus de Polytechnique, Palaiseau and Université Paris-Sud, Orsay, France; <sup>3</sup>Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Cantoblanco. Madrid, Spain; <sup>4</sup>Materials Science Division, Argonne National Laboratory, Argonne, IL, USA; <sup>5</sup>Oak Ridge National Laboratory, Oak Ridge, TN, USA

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## THURSDAY JUNE 7 AFTERNOON

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Room: CASCIA

### Session CM-4 - Innovative Processing in Silicate Ceramics

Chair: Dachamir HOTZA, Brazil

- 14.30 CM-4:L05 **Study of the Thermal Behavior and VOC Emission of Digital Inks and Glazes for Ceramic Tiles**  
**P. ZANNINI**, G. FERRARI, University of Modena and Reggio Emilia, Chemical and Geological Science Dept., Modena, Italy
- 15.00 CM-4:L06 **New Advances on Functional Porcelain Technology**  
**NOBUAKI KAMOCHI**, K. NISHIYAMA, H. KATSUKI, Saga Ceramics Research Laboratory, Arita-machi, Saga, Japan
- 15.30 CM-4:L07 **Densification of Porcelain Stoneware Tiles: A Simplified Model Based on Technological Properties**  
**C. ZANELLI**, S. CONTE, R. SOLDATI, M. DONDI, CNR-ISTEC, Faenza, Italy
- 15.50 CM-4:L08 **Phase Transformations and Related Liquid Phase Physical Properties: Evolution During the Viscous Flow Sintering in Porcelain Stoneware Tiles**  
**S. CONTE<sup>1</sup>**, C. ZANELLI<sup>1</sup>, M. ADIT<sup>2</sup>, G. CRUCIANI<sup>2</sup>, M. DONDI<sup>1</sup>, <sup>1</sup>CNR-ISTEC, Faenza Italy; <sup>2</sup>Dept. of Physics and Earth Sciences, University of Ferrara, Italy
- 16.10 CM-4:L09 **The Valorization of Phosphogypsum in the Development of New Composite Materials and Modeling of Mechanical Stress**  
**Y. RAKHILA**, A. EZZABI, A. MESTARI, A. ELMCHAOURI, Laboratory of Physical Chemistry and Bioorganic Chemistry, Faculty of Science and Techniques Mohammed V, Mohammed V, Morocco
- 16.30 Break

### Session CM-5 - Geopolymers

Chair: Jonjaua RANOGLAJEC, Serbia

- 17.00 CM-5:L05 **Effect of Aluminum and Alkali Cation Earth Reactivity on Alkali-activated Materials Formation and Structure**  
**A. GHARZOUNI**, L. OUAMARA, S. ROSSIGNOL, SPCTS, ENSCI, Limoges, France; I. SOBRADOS, Instituto de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain
- 17.20 CM-5:L06 **Thermal Stability and Mechanical Properties of Wollastonite Reinforced Fly Ash-based Geopolymer**  
**K. HEMRA**, S. JIEMSIRILERS, Dept. of Materials Science, Faculty of Science, Chulalongkorn University, Bangkok, Thailand; P. AUNGKAVATTANA, National Nanotechnology Center, Bangkok, Thailand; T. KOBAYASHI, Dept. of Materials Science and Technology, Nagaoka University of Technology, Niigata, Japan
- 17.40 CM-5:L07 **Synthesis of Geopolymer Foams: Application in the Retention of Heavy Metals**  
**K. KHATIB**, H. BENBAKRIM, M. EL AZHARI, Cadi Ayyad University, Marrakech, Morocco

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## THURSDAY JUNE 7 AFTERNOON

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Room: BEVAGNA

### Session CN-6 - Refractory Materials for Novel or Advanced Applications

Chair: Yawei LI, China

14.30 CN-6:IL04 **Flame Spraying Approaches for Advanced Refractory Applications**

**P. GEHRE**, C.G. ANEZIRIS, TU Bergakademie Freiberg, Institute of Ceramic, Glass and Construction Materials, Freiberg, Saxony, Germany

15.00 CN-6:IL05 **Refractory Filtering Materials for Clean Steel Technology**

**C.G. ANEZIRIS**, P. GEHRE, A. SCHMIDT, E. STORTI, S. DUDCZIG, J. HUBALKOVA, Institute of Ceramic, Glass and Construction Materials, Technical University of Freiberg, Freiberg, Germany

15.30 CN-6:L06 **Study of Innovative Refractory Solutions for Improving Efficiency of Industrial Furnaces**

**D. OLEVANO**, U. MARTINI, P. MICELI, A. DI DONATO, RINA CONSULTING - Centro Sviluppo Materiali S.p.A., Rome, Italy

15.50 Break

### Session CN-7 - Future Refractory Education Needs

Chair: Christos G. ANEZIRIS, Germany

16.20 CN-7:IL01 **Complex Engineering Systems; The Next Step for the Ceramic Refractory Area**

**V.C. PANDOLFELLI**, Federal University of São Carlos - DEMa, São Carlos, SP, Brazil

16.50 CN-7:IL02 **The FIRE Compendium Series on Corrosion of Refractories to Match Educational Needs**

**M. RIGAUD**, Ecole Polytechnique, University of Montreal, Montreal, Quebec, Canada

17.20 CN-7:IL03 **How to Cover the Spectrum of Education Needs for the Refractory Industry**

**P. QUIRMBACH**, ECREF European Centre for Refractories, Höhr-Grenzhausen, Germany

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## THURSDAY JUNE 7 AFTERNOON

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Room: SPELLO

### **Session CO-3 - Processing and Fabrication of MMCS, CMCS, and C/C Composites**

Chair: Walter KRENKEL, Germany

- 14.30 CO-3:IL07 **An Overview on the Recent Researches on Metal Matrix Composites**

**Y. LE PETITCORPS**, LCTS UMR 5801, University of Bordeaux, Pessac, France

- 15.00 CO-3:IL08 **Additive Manufacturing of Light Weight and High Power Density Propulsion Systems**

**M.C. HALBIG**, NASA Glenn Research Center, Cleveland, OH, USA; M. SINGH, Ohio Aerospace Institute, Cleveland, OH, USA

- 15.30 *Break*

Chair: Monica FERRARIS, Italy

- 16.00 CO-3:IL09 **High Temperature Molybdenum Matrix Composites**

**S. MILEIKO**, Institute of Solid State Physics of Russian Academy of Sciences, Chernogolovka, Russia

- 16.30 CO-3:L10 **Ceramic Matrix Composites (CMCs) for High Temperature Industrial Applications**

**L. CAVALLI**, F. GIACOMETTI, F. BERNARDINELLO, Petroceramics spa, Stezzano, Italy

- 16.50 CO-3:L11 **Impact of Matrix Composition on the Properties of SiC/ SiC Ceramic Matrix Composites**

**K. SCHOENFELD**, H. KLEMM, Fraunhofer IKTS, Dresden, Germany

- 17.10 CO-3:L12 **New Large-scale Production Method for C/C-SiC Ceramics**

D.J. NESTLER, **J. STILLER**, L. KROLL, University of Technology Chemnitz, Chemnitz, SN, Germany

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## FRIDAY JUNE 8 MORNING

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Room: ASSISI A

### Session CA-4 - Sintering

Chair: Yoshio SAKKA, Japan

- 9.00 CA-4:L10 **Processing of Dental Zirconia: How to Play on the Trade-off between Aesthetics, Mechanical Properties and Long-term Stability?**  
J. CHEVALIER, FEI ZHANG, H. REVERON, E. CAMPOSILVAN, L. GREMILLARD, University of Lyon, UMR CNRS 5510 (MATEIS), INSA de Lyon, France
- 9.30 CA-4:L11 **Thin Water Films on Nanocrystalline Oxides: Influence on Particle Coarsening, Coalescence and Grain Morphology Evolution**  
O. DIWALD, D. THOMELE, Dept. of Chemistry and Physics of Materials, University of Salzburg, Salzburg, Austria; A. GHEISI, Dept. of Chemical and Bioengineering, Friedrich-Alexander-University Erlangen-Nürnberg, Erlangen, Germany; J. BERNARDI, University Service Center for Transmission Electron Microscopy, Vienna University of Technology, Vienna, Austria; H. GRÖNBECK, Dept. of Physics and Competence Centre for Catalysis, Chalmers University of Technology, Gothenburg, Sweden
- 9.50 CA-4:L12 **Sintering and Viscous Behavior of a Low Temperature Co-fired Ceramic (LTCC) - From Experimental Characterization to Numerical Simulation of Co-sintering**  
A. HEUX<sup>1</sup>, G. ANTOU<sup>1</sup>, N. DELHOTE<sup>2</sup>, N. PRADEILLES<sup>1</sup>, A. MAITRE<sup>1</sup>, <sup>1</sup>Univ. Limoges, CNRS, SPCTS, UMR 7315, France; <sup>2</sup>Univ. Limoges, CNRS, XLIM, UMR 7252, France
- 10.10 CA-4:L13 **Ultrastrong Zirconia Ceramics Fabricated by an Oscillatory Pressure Sintering Process**  
TIANBIN ZHU<sup>1,2,3</sup>, ZHIPENG XIE<sup>3</sup>, YAWEI LI<sup>1,2</sup>, <sup>1</sup>The State Key Lab. of Refractories and Metallurgy, Wuhan University of Science and Technology, Wuhan, China; <sup>2</sup>National-provincial Joint Eng. Research Center of High Temperature Materials and Lining Technology, Wuhan University of Science and Technology, Wuhan, China; <sup>3</sup>State Key Lab. of New Ceramics and Fine Processing, School of Materials Science and Eng., Tsinghua University, Beijing, China
- 10.30 Break

### Session CA-5 - Innovation in Manufacturing Technology

Chair: Frank KERN, Germany

- 11.00 CA-5:L03 **Challenges in Scaling up Zirconia-based Bioceramics: From the Development of a Material at the Laboratory Scale to an Effective Industrial Production**  
H. REVERON<sup>1</sup>, FEI ZHANG<sup>1</sup>, M. FORNABAIO<sup>2</sup>, P. PALMERO<sup>2</sup>, L. MONTANARO<sup>2</sup>, T. FÜRDERER<sup>3</sup>, N. COURTOIS<sup>4</sup>, J. CHEVALIER<sup>1</sup>, <sup>1</sup>Université de Lyon-INSA de Lyon, MATEIS CNRS UMR 5510, Villeurbanne Cedex, France; <sup>2</sup> Dept. of Applied Science and Technology, INSTM R.U. PoliTO, LINCE Lab., Politecnico di Torino, Torino, Italy; <sup>3</sup>DOCERAM, MOESCHTER GROUP Holding GmbH & Co. KG, Dortmund, Germany; <sup>4</sup>Anthogyr SAS, Sallanches, France
- 11.30 CA-5:L02 **High Performance of Ceramics and Manufacturing Process Innovation**  
YOSHIO SAKKA, National Institute for Materials Science, Japan Science and Technology Agency, Tsukuba, Japan

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## **FRIDAY JUNE 8 MORNING**

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*Room: ASSISI B*

### **Session CB-6 - Other Non Traditional or Novel Routes**

*Chair: Gideon GRADER, Israel*

- 9.00 **CB-6:L01 Novel Colloidal Syntheses in Molten Salts Toward Complex Nanoparticles**  
**D. PORTEHAULT**, Sorbonne Universités, UPMC Univ Paris 06, CNRS, Collège de France, Laboratoire de Chimie de la Matière Condensée de Paris, Paris, France
- 9.30 **CB-6:L02 High Temperature Adhesives Derived from SiBCN Precursors**  
SUN CHANG, JIANQIANG WANG, **XINGANG LUAN**, LAIFEI CHENG, Science and Technology on Thermostructural Composite Materials Laboratory, Northwestern Polytechnical University, Xi'an, China
- 10.00 **CB-6:L03 Hybrid Simulations of Formation of Nanocomposite Materials with a Scaffold of Carbon Nanotubes and Boron Carbide Matrix by Means of Chemical Vapor Infiltration Technique**  
**A.N. VOLKOV**, Department of Mechanical Engineering, University of Alabama, Tuscaloosa, AL, USA
- 10.20 **CB-6:L04 Effect of Gold Nanoparticles on Corrosion Behavior of Melting Gel Coatings on Stainless Steel**  
**L.C. KLEIN<sup>1</sup>**, S. KALLONTZI<sup>1</sup>, L. FABRIS<sup>1</sup>, A. ARPINO<sup>1</sup>, A. JITIANU<sup>2,3</sup>, J. MOSA<sup>4</sup>, M. APARICIO<sup>4</sup>, <sup>1</sup>Rutgers University, Department of Materials Science and Engineering, Piscataway, NJ, USA; <sup>2</sup>Department of Chemistry, Davis Hall, Lehman College-CUNY, Bronx, NY, USA; <sup>3</sup>Chemistry Program, The Graduate Center, The City University of New York, New York, NY, USA; <sup>4</sup>Instituto de Cerámica y Vidrio-CSIC, Campus de Cantoblanco, Madrid, Spain

10.40 *Break*

*Chair: Shu YIN, Japan*

- 11.10 **CB-6:L06 Electrospinning of Mesoporous Ceramic Nanofibers**  
O. ELISHAV<sup>1</sup>, V. BEILIN<sup>2</sup>, G.E. SHTER<sup>2</sup>, **G.S. GRADER<sup>2</sup>**, <sup>1</sup>The Nancy and Stephen Grand Technion Energy Program, Technion I.I.T, Haifa, Israel, <sup>2</sup>The Wolfson Department of Chemical Engineering, Technion I.I.T, Haifa, Israel
- 11.40 **CB-6:L07 Synthesis of Nano-carbons and Nano-Ilmenites using Super-High-Energy Ball Milling**  
**SATOSHI OHARA**, Joining and Welding Research Institute, Osaka University, Ibaraki, Japan
- 12.00 **CB-6:L08 The Film Boiling Chemical Vapor Infiltration for the Elaboration of Oxide/Oxide Composites**  
**C. BESNARD**, L. MAILLE, Université de Bordeaux, LCTS, Lab. des Composites ThermoStructuraux, CNRS, CEA, SAFRAN, Pessac, France; P. DAVID, CEA Le Ripault, Commissariat à l'Energie Atomique, Monts, France; A. ALLEMAND, CEA Le Ripault, Commissariat à l'Energie Atomique, Monts, France and Université de Bordeaux, LCTS, Lab. des Composites ThermoStructuraux, CNRS, CEA, SAFRAN, Pessac, France

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## **FRIDAY JUNE 8 MORNING**

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*Room:* **VIP**

### **Session CB-9.6 - Other/Emerging AD Routes**

*Chair:* Roger J. NARAYAN, USA

- 9.30 **CB-9.6:L01 Layerwise Slurry Deposition for Additive Manufacturing of Ceramics**  
**A. ZOCCA**, P. LIMA, J. LÜCHTENBORG, J. GUENSTER, BAM Federal Institute for Materials Research and Testing, Berlin, Germany; T. MUEHLER, Clausthal University of Technology, Clausthal-Zellerfeld, Germany
- 10.00 **CB-9.6:L02 Additive Manufacturing of Dense and Adherent Ceramic Coatings by Powder Deposition without Sintering**  
**I. NOMEL**<sup>1,2</sup>, F. BERTHOIX<sup>1</sup>, O. DURAND<sup>1</sup>, P. MARCHET<sup>2</sup>, <sup>1</sup>Center for Technology Transfer in Ceramics, Limoges Cedex, France; <sup>2</sup>Institute of Research for Ceramics, Limoges Cedex, France
- 10.20 **CB-9.6:L03 Additive Manufacturing of Dense Ceramics with Laser Induced Slip Casting (LIS)**  
**J. LUECHTENBORG**, A. ZOCCA, J. GUENSTER, Federal Institute for Materials Research and Testing (BAM), Division 5.4 - Ceramic Processing and Biomaterials, Berlin, Germany; T. MUEHLER, Clausthal University of Technology (TUC), Institute of Non-Metallic Materials, Clausthal-Zellerfeld, Germany

10.40 *Break*

*Chair:* Andrea ZOCCA, Germany

- 11.10 **CB-9.6:L05 Laser-based Additive Manufacturing for Medical Applications**  
**R.J. NARAYAN**, UNC/NCSU Joint Department of Biomedical Engineering, Raleigh, NC, USA
- 11.40 **CB-9.6:L06 Creation of Dense Technical Ceramics by Powder Bed Three Dimensional Printing**  
**P. GINGTER**, A. LYNEN, J. HEYM, Schunk Ingenieurkeramik GmbH, Willich-Münchheide, Germany
- 12.10 **CB-9.6:L07 Digital Printing of Glass-ceramic Glazes**  
**M. CANNIO**<sup>1</sup>, D.N. BOCCACCINI<sup>1</sup>, V. RIVA<sup>1</sup>, M. HANUSKOVA<sup>1</sup>, M. ROMAGNOLI<sup>1</sup>, R. TAURINO<sup>2</sup>, F. BONDIOLI<sup>2</sup>, M. TOGNETTI<sup>3</sup>, M. CICCONI<sup>4</sup>, T. FEY<sup>4</sup>, V. NOVARESIO<sup>5</sup>, A.R. BOCCACCINI<sup>6</sup>, <sup>1</sup>Dipartimento di Ingegneria Enzo Ferrari, Università di Modena e Reggio Emilia, Italy; <sup>2</sup>Dipartimento di Ingegneria e Architettura, Università di Parma, Italy; <sup>3</sup>Daxel S.r.l., Rubiera RE, Italy; <sup>4</sup>Institute of Glass and Ceramics, Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Erlangen, Germany; <sup>5</sup>ALLOVIS Engineering, Torino, Italy; <sup>6</sup>Institute of Biomaterials, Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Erlangen, Germany

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## **FRIDAY JUNE 8 MORNING**

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*Room:* **MONTEFALCO**

### **Session CC-2 - Corrosion**

*Chair:* Marianne BALAT-PICHELIN, France

- 9.30 CC-2:L12 **High-temperature Ageing of Si/SiC Ceramics**  
**L. CHARPENTIER**, C. CALIOT, PROMES-CNRS, Font-Romeu Odeillo, France
- 9.50 CC-2:L13 **Tribocorrosion and Corrosion Studies on Stainless Steel Substrates Covered with DCL Films in Ethanol with Different Concentrations of Water**  
**P.A. RADI**<sup>1,2</sup>, A.C. SENE<sup>2</sup>, M.A. RAMIREZ<sup>2</sup>, P. LEITE<sup>2</sup>, L. VIEIRA<sup>1,2</sup>,  
<sup>1</sup>Instituto Tecnologico de Aeronautica (ITA), São José dos Campos, SP, Brazil; <sup>2</sup>Universidade do Vale do Paraíba (Univap), Urbanova, São José dos Campos - SP, Brazil

10.10 *Break*

*Chair:* Klaus G. NICKEL, Germany

- 10.40 CC-2:L14 **Environmental Barrier Coating Stability in High Temperature Water**  
R.A. GOLDEN, C.G. PARKER, M.J. RIDLEY, **E.J. OPILA**, Dept. of Materials Science and Engineering, University of Virginia, Charlottesville, Virginia, USA
- 11.10 CC-2:L15 **Effects of Oxygen Potential Gradient and Electrical Characteristics on Mass Transfer in Environmental Barrier Coatings at High Temperature**  
**SATOSHI KITAOKA**, T. MATSUDAIRA, M. TANAKA, Japan Fine Ceramics Center, Nagoya, Japan; T. SATO, O. SAKURADA, Gifu University, Gifu, Japan; Y. KAGAWA, Tokyo University of Technology, Hachioji, Japan

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## **FRIDAY JUNE 8 MORNING**

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*Room:* **SALA RELATORI**

### **Session CD-3 - Macro-joining**

*Chair:* Ivar E. REIMANIS, USA

- 9.00 **CD-3:IL04 Joining of UHTC Composite using Powder-based Metallic Interlayer**  
**NORITAKA SAITO**, KUNIHIKO NAKASHIMA, Kyushu University, Fukuoka, Japan
- 9.30 **CD-3:IL05 The Role of Wetting in Joining**  
**D.P. SEKULIC**, College of Engineering, University of Kentucky, Lexington, KY, USA; School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China
- 10.00 **CD-3:L06 Mechanical Property of Dissimilar Metal Joints made by Friction Stirring**  
**MASAHIRO FUKUMOTO**, TOSHIAKI YASUI, Toyohashi University of Technology, Toyohashi, Japan
- 10.20 *Break*

*Chair:* Masahiro FUKUMOTO, Japan

- 10.50 **CD-3:IL01 Wettability-induced Change in Crystallization Behavior of Supercooled Liquids Composed of Li<sub>2</sub>O-SiO<sub>2</sub>**  
**SOHEI SUKENAGA**, M. TASHIRO, H. SHIBATA, IMRAM, Tohoku University, Sendai, Japan
- 11.20 **CD-3:IL02 Crack Paths in Layered, Graded Joints**  
**I. REIMANIS**, Colorado School of Mines, Golden, CO, USA
- 11.50 **CD-3:L03 Homogeneous Diffusion Bonding of ZrCx: Empirical Evidence and Phase Field Modeling**  
**RUI PAN<sup>1,2</sup>**, S. KOVACEVIC<sup>3</sup>, D.P. SEKULIC<sup>1,2</sup>, S.DJ. MESAROVIC<sup>3</sup>, <sup>1</sup>University of Kentucky, Lexington, KY, USA; <sup>2</sup>Harbin Institute of Technology, China; <sup>3</sup>Washington State University, USA

### **Session CD-4 - Application Engineering**

- 12.10 **CD-4:IL03 Torsion Shear Testing of Ceramic Joints for Components Design**  
**J. KUEBLER**, G. BLUGAN, G. MATA-OSORO, Empa, Swiss Federal Laboratories for Materials Science and Technology Laboratory for High Performance Ceramics, Duebendorf, Switzerland

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## FRIDAY JUNE 8 MORNING

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Room: MAGIONE B

### Session CE-3 - Functional Materials and Sustainability

Chair: Henry A. SODANO, USA

- 9.00 **CE-3:IL06 Engineering Hematite and Silicon for Efficient Photoelectrochemical Water Splitting**  
**SHAOHUA SHEN**, International Research Center for Renewable Energy, State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, China
- 9.30 **CE-3:IL07 3D Nanoarchitectures for Energy Technologies and Bio-medical Sensing - Enhancing Functionality through Correlative Microscopy**  
**S.H. CHRISTIANSEN**, Helmholtz-Zentrum Berlin, Germany
- 10.00 **CE-3:L08 CO<sub>2</sub>/H<sub>2</sub>O Thermochemical Splitting on Porous SiOC Nanocomposites Decorated with 1D Catalytic Nanostructures**  
**AITANA TAMAYO<sup>1</sup>**, B. GARCIA<sup>2</sup>; E. CASADO<sup>3</sup>, <sup>1</sup>Ceramics and Glass Institute, CSIC, Madrid, Spain; <sup>2</sup>Universidad Rey Juan Carlos, Madrid, Spain; <sup>3</sup>Universidad Politecnica Madrid, Madrid, Spain

10.20 Break

Chair: Sanjay MATHUR, Germany

- 10.50 **CE-3:IL10 3D SEM Analysis of Nanostructured Materials prior to Morphological Characterization of Adipose Tissue**  
R. SKAUDZIUS, E. GARSKAITE, **A. KAREIVA**, Institute of Chemistry, Vilnius University, Vilnius, Lithuania
- 11.20 **CE-3:IL11 Flux Crystal Growth Concept as New Approaches to Material Synthesis and Design: A Challenge for All-solid-state Lithium Ion Batteries**  
**KATSUYA TESHIMA**, NOBUYUKI ZETTSU, Center for Energy and Environmental Science, Shinshu University, Nagano, Japan
- 11.50 **CE-3:L12 Ultra-long Vertically Aligned Lead Titanate Nanowire Arrays for Energy Harvesting in Extreme Environments**  
A. NAFARI<sup>1</sup>, C.C. BOWLAND<sup>2</sup>, **H.A. SODANO<sup>1,3</sup>**, <sup>1</sup>Department of Aerospace Engineering, University of Michigan, Ann Arbor, MI, USA; <sup>2</sup>Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA; <sup>3</sup>Department of Material Science Engineering, University of Michigan, Ann Arbor, MI, USA

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## **FRIDAY JUNE 8 MORNING**

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*Room:* **ORVIETO A**

### **Session CF-3 - Mechanical and Thermal Properties**

*Chair:* Joseph Y.R. RASHID, USA

- 10.00 **CF-3:IL13 On the Plasticity and Grain Growth in Boron Carbide Ceramics**  
**D. GOMEZ-GARCIA**, B.M. MOSHTAGHIOUN, A. DOMINGUEZ-RODRIGUEZ, Department of Condensed Matter Physics, University of Seville, Spain
- 10.30 **CF-3:IL14 Boride Ceramics with High Strength at Ultra-high Temperatures**  
**L. SILVESTRONI**<sup>1</sup>, D. SCITI<sup>1</sup>, J. WATTS<sup>2</sup>, W. FAHRENHOLTZ<sup>2</sup>, G. HILMAS<sup>2</sup>, <sup>1</sup>CNR-ISTEC, Faenza, Italy; <sup>2</sup>Dept. of Materials Science and Engineering, Missouri University of Science and Technology, Rolla, MO, USA
- 11.00 **CF-3:L15 Grahene-reinforced Alumina and Zirconia Composites: On their Potential Applications**  
**R. CANO-CRESPO**, B.M. MOSHTAGHIOUN, D. GOMEZ-GARCIA, R. MORENO, A. DOMINGUEZ RODRIGUEZ, Department of Condensed Matter Physics, University of Seville, Spain Institute of Ceramics and Glass, CSIC, Spain

11.20 *Break*

### **Session CF-4 - Characterization and Analysis**

*Chair:* Henning HEUER, Germany

- 11.50 **CF-4:IL01 Nano-mechanical Testing of ZrB<sub>2</sub> Ceramics**  
**J. DUSZA**, Institute of Materials Research, SAS, Kosice, Slovakia
- 12.20 **CF-4:L02 Characterization of the Microstructure of 3C-SiC Coatings Grown by Chemical Vapor Infiltration (CVI)**  
**I. BERDOYES**<sup>1, 2</sup>, Y. LE PETITCORPS<sup>2</sup>, H. PLAISANTIN<sup>1, 2</sup>, J. ROGER<sup>2</sup>, <sup>1</sup>Safran CERAMICS; <sup>2</sup>University of Bordeaux, LCTS, UMR 5801, Pessac, France

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## **FRIDAY JUNE 8 MORNING**

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*Room: ORVIETO B*

### **Session CG-8 - Energy Storage**

*Chair: Martin DAHLQVIST, Sweden*

- 9.30 CG-8:L01 **High-capacitance Mechanism for Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene by in Situ Electrochemical Raman Spectroscopy Investigation**  
**XIAOHUI WANG**, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China
- 10.00 CG-8:L02 **MXenes as Hosting Materials for Ions and Molecules**  
**M. NAGUIB**, Department of Physics and Engineering Physics, Tulane University, New Orleans, LA, USA
- 10.30 CG-8:L03 **Microwave-assisted Synthesis of MXene-based Hybrids for Energy Storage in Supercapacitor and LIB**  
W. ZHENG, **ZHENG MING SUN**, Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China

11.00 *Break*

### **Session CG-9 - Applications of the MAX/MAB and MXene Phases**

*Chair: Xiaohui WANG, China*

- 11.30 CG-9:L03 **Applications 2D Carbides, Nitrides and Carbonitrides (MXenes)**  
**Y. GOGOTSI**, B. ANASORI, A.J. Drexel Nanomaterials Institute, and Department of Materials Science & Engineering, Drexel University, Philadelphia, PA, USA
- 11.50 CG-9:L04 **Irradiation Tolerance of Zr<sub>2</sub>AlC MAX Phase**  
**H. QARRA**, K. KNOWLES, University of Cambridge, Cambridge, UK

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## **FRIDAY JUNE 8 MORNING**

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*Room:* **SPOLETO B**

### **Session CH-6 - Modelling and Simulation of Coatings and Films**

*Chair:* Rainer GADOW, Germany

- 9.30 **CH-6:IL01 Finite Element (FE) Modelling of Thermal Spray Coatings: Case Studies**  
**G. BOLELLI**, L. LUSVARGHI, T. MANFREDINI, P. PUDDU, V. TESTA, University of Modena and Reggio Emilia, Modena, Italy
- 10.00 **CH-6:IL02 Multi-scale Modelling of Thin Films and Coatings for Scientific and Industrial Outcomes**  
**H. RONKAINEN**, A. LAUKKANEN, K. HOLMBERG, T. ANDERSSON, T. SUHONEN, VTT Technical Research Centre of Finland Ltd, Espoo, Finland
- 10.30 **CH-6:IL03 Reactive Sputter Deposition Visualized by Modelling**  
**D. DEPLA**, K. STRIJCKMANS, R. SCHELFHOUT, Department of Solid State Sciences, Ghent University, Gent, Belgium

11.00 *Break*

### **Session CH-7 - Industrial Processing in Advanced Surface Technologies**

*Chair:* Giovanni BOLELLI, Italy

- 11.30 **CH-7:IL02 Scratch-resistant Transparent Sapphire Coating by Aerosol Deposition for Cover Glass Application of Smart Phone**  
**JAE-HYUK PARK**, DAE-GUN KIM, JONGWOO LIM, HYE-WON SEOK, MYUNG-NO LEE, BYUNG-KI KIM, IONES Co.,Ltd., Anseong-si, Gyeonggi-do, South Korea
- 12.00 **CH-7:IL04 Highly Ionized Deposition of Hard Coatings**  
**H. GERDES**, R. BANDORF, K. ORTNER, M. VERGÖHL, G. BRÄUER, Fraunhofer Institute for Surface Engineering and Thin Films IST, Braunschweig, Germany

Room: **MAGIONE A**

## **Session CI-6 - Progress in Applications of Porous Ceramics**

Chair: **Vanesa GIL**, Spain

- 9.00 **CI-6:L01 Additively-manufactured Reactors for the Intensification of H<sub>2</sub> Production by Steam Methane Reforming: Fabrication, Functionalization and Recycling Issues**  
**F. ROSSIGNOL**, T. CHARTIER, B. TROUILHET, IRCER, UMR CNRS 7315, Limoges cedex, France; B. CROISSANT, R. FAURE, P. DEL GALLO, AIR LIQUIDE, CRPS, Jouy en Josas, France
- 9.30 **CI-6:L02 Development of Small Scale Ceramic Microbial Fuel Cells for Clean Energy Extraction from Urine**  
**I. GAJDA, X.A. WALTER**, T. OBATA, J. GREENMAN, I. IEROPOULOS, Bristol BioEnergy Centre, BRL, T-Bloc, University of the West of England, Bristol, UK
- 9.50 **CI-6:L03 Transesterification of Soybean Oil using Geopolymers as Heterogeneous Catalysts**  
**R.F. BOTTI<sup>1</sup>**, M.D.M. INNOCENTINI<sup>2</sup>, P. PASTORE<sup>3</sup>, L.R. SAN GREGORIO<sup>2</sup>, P. COLOMBO<sup>1</sup>, <sup>1</sup>Dept. of Industrial Engineering, University of Padova, Padova, Italy; <sup>2</sup>Course of Chemical Engineering, University of Ribeirão Preto, Ribeirão Preto-SP, Brazil; <sup>3</sup>Dept. of Chemical Sciences, University of Padova, Padova, Italy
- 10.10 **CI-6:L04 Ultrasmall Mesoporous Silica: A Better Catalysis Support**  
**JIASHENG WANG**, W. WU, W.H. WANG, M. BAO, School of Petroleum and Chemical Engineering, Dalian University of Technology, Panjin, China
- 10.30 *Break*

Chair: **Joachim VOGT**, Germany

- 11.00 **CI-6:L05 Polymer-derived Mesoporous Ceramics as Catalysis Supports and Co-catalysts for Hydrogen Generation**  
**A. LALE<sup>1</sup>**, U.B. DEMIRCI<sup>2</sup>, S. BERNARD<sup>1</sup>, <sup>1</sup>Institut de Recherche sur les céramiques (IRCER) UMR 7315 CNRS-Centre Européen de la Céramique, Limoges, France; <sup>2</sup>Institut Européen des Membranes - IEM UMR 5635, Université de Montpellier, Montpellier, France
- 11.30 **CI-6:L06 High Performance Porous Ceramics for Energy Related Applications**  
**J. GURAUSKIS<sup>1,2</sup>**, **V. GIL<sup>1,3</sup>**, <sup>1</sup>Fundación Agencia Aragonesa para la Investigación y Desarrollo (ARAID), Zaragoza, Spain; <sup>2</sup>AENEAM Advanced Membrane Technologies S.L., Zaragoza, Spain; <sup>3</sup>Fundación Nuevas Tecnologías del Hidrógeno en Aragón, Parque Tecnológico Walqa, Huesca, Spain
- 12.00 **CI-6:L07 Design Approach for Porous Ceramics in Concentrated Solar Power Application**  
**J. ADLER, A. FÜSSEL**, W. BECKERT, Fraunhofer IKTS, Dresden, Germany; F. ZAVERSKY, L. ALDAZ, M. SÁNCHEZ, National Renewable Energy Center (CENER), Solar Thermal Energy Department, Spain; A.L. AVILA-MARIN, M. ISABEL ROLDAN, J. FERNANDEZ-RECHE, CIEMAT-Plataforma Solar de Almeria, Spain
- 12.20 **CI-6:L08 Enzyme-modified Porous Ceramic Capillaries for Continuous Flow Hydrolysis of Proteins**  
**M.M. HOOG ANTINK<sup>1</sup>**, T. SEWCZYK<sup>2</sup>, S. KROLL<sup>3</sup>, S. BEUTEL<sup>2</sup>, M. MAAS<sup>1</sup>, K. REZWAN<sup>1</sup>, <sup>1</sup>Advanced Ceramics, University Bremen, Bremen, Germany; <sup>2</sup>Institute for Technical Chemistry, Leibniz University Hannover, Hannover, Germany; <sup>3</sup>Institute for Bioplastics and Biocomposites, Hochschule Hannover, Hannover, Germany

*Room: SPOLETO A*

**Session CJ-5 - Fast Ion-conducting Ceramics**

*Chair: Kyle S. BRINKMANN, USA*

- 9.30 **CJ-5:IL02 Material Design for an Electrode of an Oxygen Pump Based on Oxide-ion Conductors**  
**KEN WATANABE**, Kyushu University, Kasuga, Japan
- 10.00 **CJ-5:IL03 Electrochemical Membranes in Energy Conversion**  
**F. MARQUES**, Dept. of Materials and Ceramic Eng./CICECO, University of Aveiro, Aveiro, Portugal

10.30 *Break*

**Session CJ-2 - Ferroelectric, Piezoelectric, Pyroelectric, and Ferroelastic Ceramics**

*Chair: Lorena PARDO, Spain*

- 11.00 **CJ-2:L18 Simultaneous Characterization of Charge and Structural Motion during Ferroelectric Polarization Reversal**  
**C. KWAMEN<sup>1</sup>**, M. RÖSSLE<sup>2</sup>, M. REINAARDT<sup>1</sup>, W. LEITENBERGER<sup>2</sup>, F. ZAMPONI<sup>2</sup>, M. ALEXE<sup>3</sup>, M. BARGHEER<sup>1, 2</sup>, <sup>1</sup>Helmholtz Zentrum Berlin, Berlin, Germany; <sup>2</sup>Institute of Physics University of Potsdam, Germany; <sup>3</sup>Department of Physics, University of Warwick, UK
- 11.20 **CJ-2:L19 Processing and Properties of Lead-free BiFeO<sub>3</sub>-SrTiO<sub>3</sub> Piezoceramics**  
**M. MAKAROVIC<sup>1, 2</sup>**, A. BENCAN<sup>1, 2</sup>, B. MALIC<sup>1, 2</sup>, T. ROJAC<sup>1, 2</sup>, <sup>1</sup>Electronic Ceramics Department, Jozef Stefan Institute, Ljubljana, Slovenia; <sup>2</sup>Jozef Stefan International Postgraduate School, Ljubljana, Slovenia
- 11.40 **CJ-2:IL22 Morphotropic Phase Boundaries in Polycrystalline Relaxor-ferroelectrics**  
**M. OTONICAR**, H. URSIC, B. JANCAR, A. BENCAN, B. MALIC, T. ROJAC, Jozef Stefan Institute, Ljubljana, Slovenia; G. ESTEVES, J.L. JONES, Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC, USA

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## **FRIDAY JUNE 8 MORNING**

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*Room:* **CORCIANO**

### **Session CK-8 - Novel Synthesis and Characterization Techniques**

*Chair:* Agnes BARTHELEMY, France

- 9.30 **CK-8:IL02 Atomic-scale Characterization of Charge Distributions at Oxide Interfaces and Néel-Type Domain Walls Using Scanning Transmission Electron Microscopy**  
**MING-WEN CHU**, National Taiwan University, Taipei, Taiwan
- 10.00 **CK-8:IL04 New Directions in Materials Characterization with Hard x-ray Photoemission**  
**J.-P. RUEFF**, Synchrotron SOLEIL, Gif sur Yvette, and LCPMR, CNRS - Sorbonne Université, France; C.S. FADLEY, Department of Physics, University of California Davis and Materials Sciences Division, Lawrence Berkeley National Laboratory, Davis, CA, USA

10.30 *Break*

### **Session CK-9 - Application in Electronics and Energy**

*Chair:* Tsutomu NOJIMA, Japan

- 11.00 **CK-9:IL01 Energy Efficiency in Electrocaloric Heat Exchangers**  
**E. DEFAY**, R. FAye, S. Nicolau, D. Sette, H. Strozyk, Luxembourg Institute of Science and Technology, Belvaux, Luxembourg
- 11.30 **CK-9:IL03 Purely Antiferromagnetic Magnetoelectric Random Access Memory (AF-MERAM)**  
**T. KOSUB**, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

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## **FRIDAY JUNE 8 MORNING**

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*Room:* **NORCIA**

### **Session CL-6 - Photons Management**

*Chair:* Michel MORTIER, France

- 9.30 **CL-6:IL01 Whispering Gallery Mode Resonator Based Sensors**  
**T. IOPPOLO**, Southern Methodist University, Dallas, TX, USA
- 10.00 **CL-6:IL02 Rare Earth Microcavity Lasers for Silicon Nanophotonics**  
**J.D.B. BRADLEY**, McMaster University, Hamilton, Ontario, Canada
- 10.30 **CL-6:IL03 Efficient Frequency Conversion in PhoXonic Cavities Based on Whispering Gallery Mode Resonators**  
D. FARNESI, G. RIGHINI, G. NUNZI CONTI, **S. SORIA**, CNR-IFAC, Institute of Applied Physics "N. Carrara", Sesto Fiorentino, Italy

11.00 *Break*

### **Session CL-7 - Advances in Characterization Techniques**

*Chair:* Mark DUBINSKII, USA

- 11.30 **CL-7:IL03 The Role of Computations in Complex Optical Problems**  
L. RAMUNNO, **A. CALÀ LESINA**, P. BERINI, University of Ottawa, Ottawa ON, Canada
- 12.00 **CL-7:L04 Ultrafast Scanning Electron Microscopy (USEM) to Probe Charge Dynamics in Oxide Thin Films**  
**S.M. PIETRALUNGA**<sup>1,2</sup>, V. SALA<sup>2,3</sup>, G. CERULLO<sup>1,3</sup>, G. LANZANI<sup>2,3</sup>, G. IRDE<sup>2,3</sup>, M. ZANI<sup>3</sup>, A. TAGLIAFERRI<sup>2,3</sup>, <sup>1</sup>CNR-IFN, Milano, Italy; <sup>2</sup>CNST@Polimi, IIT, Milano, Italy; <sup>3</sup>Department of Physics, Politecnico di Milano, Milano, Italy

*Room:* **CASCIA**

**Session CM-5 - Geopolymers**

*Chair:* Maximina ROMERO, Spain

- 9.30 **CM-5:L10 Valorization of Biochar By-products into Alkali-activated Materials**  
**R. FARGES**, A. GHARZOUNI, S. ROSSIGNOL, SPCTS, UMR 7315, Limoges cedex, France; P. JEULIN, B. RAVIER, Etablissement MAILLOT, Vernouillet, France
- 9.50 **CM-5:L12 Effect of NaOH Concentration and Curing Time on Mechanical Properties and Microstructure of Geopolymer Prepared from Kaolin Processing Waste**  
**S. PRASANPHAN**, S. JIEMSIRILERS, Department of Materials Science, Faculty of Science, Chulalongkorn University, Pathumwan, Bangkok, Thailand; T. KOBAYASHI, Department of Materials Science and Technology, Nagaoka University of Technology, Kamitomioka, Nagaoka, Niigata, Japan; A. WANNAGON, National Metal and Materials Technology Center, Thailand Science Park, Khlong Nueng, Khlong Luang, Pathum Thani, Thailand
- 10.10 **CM-5:L13 Formation, Structure and Mechanical Properties of Alkali-activated Materials Based on CO<sub>x</sub> Argillite**  
**C. DUPUY<sup>1,2</sup>**, A. GHARZOUNI<sup>2</sup>, N. TEXIER-MANDOKI<sup>1</sup>, X. BOURBON<sup>1</sup>, S. ROSSIGNOL<sup>2</sup>, <sup>1</sup>Agence nationale pour la gestion des déchets radioactifs (Andra), Chatenay-Malabry Cedex, France; <sup>2</sup>Science des Procédés Céramiques et des Traitements de Surface (SPCTS), Centre Européen de la Céramique, Limoges Cedex, France
- 10.30 *Break*

*Chair:* Michele DONDI, Italy

- 11.00 **CM-5:L16 NMR Investigations on Silicate Compounds**  
**I. SOBRADOS**, Instituto de Ciencia de Materiales de Madrid-Consejo Superior de Investigaciones Científicas, Madrid, Spain
- 11.30 **CM-5:L17 Novel Perspectives in the Synthesis and Application of Aluminosilicate Matrix Composite Materials**  
**C. FERONE**, G. ROVIELLO, L. RICCIOTTI, R. CIOFFI, Dipartimento di Ingegneria, Università di Napoli 'Parthenope', INSTM Research Group Napoli Parthenope, Napoli, Italy

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## **FRIDAY JUNE 8 MORNING**

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*Room:* SPELLO

### **Session CO-4 - Ultrahigh Temperature Ceramic Composites (UHTCCs) and Laminated Composite Structures**

*Chair:* Evgeny A. BOGACHEV, Russia

- 9.30 CO-4:IL01 **Joining of Ceramics and CMC for Extreme Applications**  
**M. FERRARIS**, Politecnico di Torino, Torino, Italy
- 10.00 CO-4:IL02 **Mechanical Properties and Microstructure of Unidirectional UHTCCs**  
**L. ZOLI**, A. VINCI, S. FAILLA, P. GALIZIA, D. SCITI, CNR-ISTEC, Faenza, Italy
- 10.30 CO-4:IL03 **Design, Fabrication and Properties of Cf/(ZrB<sub>2</sub>)-ZrC-SiC Ultra-high Temperature Ceramic Matrix Composites**  
**DE WEI NI**, J. WANG, X. CHEN, S. DONG, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China
- 11.00 *Break*

*Chair:* Laifei CHENG, China

- 11.30 CO-4:L04 **Novel UD UHTCMCs Produced by EPD and Sintering**  
**S. FAILLA<sup>1,2</sup>**, L. ZOLI<sup>1</sup>, P. GALIZIA<sup>1</sup>, D. SCITI<sup>1</sup>, <sup>1</sup>CNR-ISTEC, Faenza, Italy; <sup>2</sup>University of Parma, Italy
- 11.50 CO-4:L05 **Low Temperature Spark Plasma Sintering of TiB<sub>2</sub> Ceramics with High-entropy Alloy as Sintering Aid**  
**WEI JI**, ZHENGYI FU, State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, China

### **Session CO-5 - Property, Modeling and Characterization**

- 12.10 CO-5:IL01 **Multi-scale Modelling of CMCs**  
**E. BARANGER**, LMT, ENS Paris-Saclay, CNRS Cachan, France

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## **FRIDAY JUNE 8 AFTERNOON**

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*Room:* **ASSISI A**

### **Session CA-5 - Innovation in Manufacturing Technology**

*Chair:* **Rajendra K. BORDIA, USA**

**14.30 CA-5:L04 Advanced Ceramic Processing with External Magnetic Field**

**TOHRU S. SUZUKI**, Ceramics Processing Group, Research Center for Functional Materials, National Institute for Materials Science, Tsukuba, Japan

**15.00 CA-5:L06 Polymer - spinel Nanocomposites for Applications in Modern Sensors and Actuators**

**E. MARKIEWICZ**, K. CHYBCZYNSKA, Institute of Molecular Physics PAS, Poznan, Poland; A. GRZABKA-ZASADZINSKA, S. BORYSIAK, Poznan University of Technology, Poznan, Poland

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## **FRIDAY JUNE 8 AFTERNOON**

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*Room:* **ASSISI B**

### **Session CB-6 - Other Non Traditional or Novel Routes**

*Chair:* Emanuel IONESCU, Germany

**14.30 CB-6:IL09 Environmental Friendly Process for Inorganic Functional Ceramics**

**SHU YIN**, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan

**15.00 CB-6:IL10 Alternative Methods of Synthesis of Calcium Silicates**

N. BETANCUR, J.C. RESTREPO, **O.J. RESTREPO**, Cement and Building Materials Group of Research. School of Mines, Universidad Nacional de Colombia, Medellin, Colombia

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## **FRIDAY JUNE 8 AFTERNOON**

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*Room:* **ORVIETO A**

### **Session CF-4 - Characterization and Analysis**

*Chair:* William G. FAHRENHOLTZ, USA

- 14.30 ***CF-4:L03 Pitfalls of Determining the Elastic Properties of Stabilized Zirconia with Indentation Methods***  
**K. WERBACH<sup>1</sup>, S. HUMMEL<sup>1</sup>, C. EBNER<sup>1</sup>, U. LOHBAUER<sup>2</sup>, H. PETERLIK<sup>1</sup>,** <sup>1</sup>University of Vienna, Vienna, Austria; <sup>2</sup>University Erlangen-Nürnberg, Erlangen, Germany
- 14.50 ***CF-4:IL05 Non-destructive Methods for Ceramic Materials - Characterization of SiC and SiC composite materials by HF Eddy Current Techniques***  
S. HILLMANN, M. SCHULZE, **H. HEUER**, Fraunhofer IKTS Dresden, Germany
- 15.20 ***CF-4:L07 The Characterization of Highly Porous Reaction-bonded Silicon Nitride Ceramics in the Presence of Oxide Additives***  
**R. NIKONAM M.**, M.D. PUGH, R.A.L. DREW, Concordia University, Department of Mechanical, Industrial and Aerospace Engineering, Montreal, Quebec, Canada

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## FRIDAY JUNE 8 AFTERNOON

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*Room:* MAGIONE B

### Session CG-3 - Mechanical Properties and Oxidation of MAX/MAB/MXenes

*Chair:* Miladin RADOVIC, USA

- 14.30 CG-3:L08 **Relationship between Microstructure and Oxidation Resistance of Ti<sub>3</sub>AlC<sub>2</sub> MAX Phase**  
**V. GAUTHIER-BRUNET**<sup>1</sup>, E. DROUELLE<sup>1, 2</sup>, J. CORMIER<sup>1</sup>, P. VILLECHASE<sup>1</sup>, S. DUBOIS<sup>1</sup>, P. SALLOT<sup>2</sup>, <sup>1</sup>Institut Pprime, CNRS, Université de Poitiers, ENSMA, UPR CNRS 3346, Futuroscope Chasseneuil, France; <sup>2</sup>Safran CRT, Magny-les-Hameaux Cedex, France
- 14.50 CG-3:L09 **Corrosion Behaviour of MAX Phases in Molten Solar Salt and Liquid Heavy Metal**  
**K. VAN LOO**<sup>1</sup>, T. LAPAUW<sup>1, 2</sup>, P. SZAKÁLOS<sup>3</sup>, K. LAMBRINOU<sup>2</sup>, J. VLEUGELS<sup>1</sup>, <sup>1</sup>KU Leuven, Department of Materials Engineering, Heverlee, Belgium; <sup>2</sup>SCK•CEN, Mol, Belgium; <sup>3</sup>KTH, Surface and Corrosion Science, Stockholm, Sweden
- 15.10 CG-3:L10 **Experimental and Theoretical Investigations on MAX/Intermetallic Two-phase Materials**  
**G. HUG**<sup>1</sup>, K. PIVEN<sup>1</sup>, A. JANKOWIAK<sup>2</sup>, C. LU<sup>1, 3</sup>, JIE ZHANG<sup>3</sup>, <sup>1</sup>LEM ONERA-CNRS, Chatillon, France; <sup>2</sup>DMAS ONERA, Châtillon France; <sup>3</sup>Harbin Institute of Technology, Harbin, China
- 15.30 CG-3:L11 **Environmental Resistance of Cr<sub>2</sub>AlC MAX Phase under Realistic Conditions**  
**J. GONZALEZ-JULIAN**, T. GO, D. MACK, O. GUILLOU, R. VASSEN, Forschungszentrum Jülich, Institute of Energy and Climate Research (IEK-1), Juelich, Germany
- 15.50 CG-3:L12 **Tensile Creep Properties of Ti<sub>3</sub>AlC<sub>2</sub>**  
**S. DUBOIS**<sup>1</sup>, E. DROUELLE<sup>1, 2</sup>, J. CORMIER<sup>1</sup>, V. GAUTHIER-BRUNET<sup>1</sup>, P. VILLECHASE<sup>1</sup>, P. SALLOT<sup>2</sup>, <sup>1</sup>Institut Pprime, CNRS - Université de Poitiers - ENSMA, UPR CNRS 3346, Futuroscope Chasseneuil, France; <sup>2</sup>Safran CRT, Magny-les-Hameaux Cedex, France

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## FRIDAY JUNE 8 AFTERNOON

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Room: ORVIETO B

### Session CG-8 - Energy Storage

Chair: Michael NAGUIB, USA

- 15.00 CG-8:L04 **A Fast Route to Synthesize CNTs@Ti3C2 Hybrid Structures**  
**WEI ZHENG**<sup>1</sup>, P.G. ZHANG<sup>1</sup>, W.B. TIAN<sup>1</sup>, J. CHEN<sup>1</sup>, Y.M. ZHANG<sup>2</sup>, Z.M. SUN<sup>1</sup>, <sup>1</sup>Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; <sup>2</sup>Jiangsu Key Laboratory of Construction Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China
- 15.20 CG-8:L05 **Core-shell SnO<sub>2</sub>@C Decorated 3D d-Ti<sub>3</sub>C<sub>2</sub> Xerogel Framework as the Anode for High-performance Lithium-ion Battery**  
**HENG ZHANG**, P.G. ZHANG, W. ZHENG, J. CHEN, W.B. TIAN, Z.M. SUN, Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; Y.M. ZHANG, Jiangsu Key Laboratory of Construction Materials, Southeast University, Nanjing, P.R. China
- 15.40 CG-8:L06 **Binder-free Ti<sub>3</sub>C<sub>2</sub> MXene-carbon Nanotube Supercapacitor Electrode Produced by Electrophoretic Deposition**  
**LI YANG**<sup>1</sup>, P. ZHANG<sup>1</sup>, W. ZHENG<sup>1</sup>, W.B. TIAN<sup>1</sup>, J. CHEN<sup>1</sup>, Y.M. ZHANG<sup>2</sup>, Z.M. SUN<sup>1</sup>, <sup>1</sup>Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; <sup>2</sup>Jiangsu Key Laboratory of Construction Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China

16.00 Break

### Session CG-9 - Applications of the MAX/MAB and MXene Phases

Chair: Michel W. BARSOUM, USA

- 16.30 CG-9:L05 **On the Feasibility of Nano-laminated Carbides as ATF Coatings in LWRs**  
**JIE ZHANG**, YIMING LEI, LINA CHEN, JINGYANG WANG, Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS, Shenyang, China
- 17.00 CG-9:L06 **MAX Phase Materials for Gen-IV Lead-fast Nuclear Reactors (LFRs)**  
**K. LAMBRINOU**<sup>1</sup>, T. LAPAUW<sup>1, 2</sup>, B. TUNCA<sup>1, 2</sup>, J. VLEUGELS<sup>2</sup>, <sup>1</sup>Belgian Nuclear Research Centre, SCK•CEN, Mol, Belgium; <sup>2</sup>Dept. of Materials Engineering, KU Leuven, Heverlee, Belgium
- 17.30 CG-9:L07 **Effect of Temperature and Atmosphere on Sn Whisker Growth on Ti<sub>2</sub>SnC**  
**YUSHUANG LIU**<sup>1</sup>, P. ZHANG<sup>1</sup>, W.B. TIAN<sup>1</sup>, Y.M. ZHANG<sup>2</sup>, Z.M. SUN<sup>1</sup>, <sup>1</sup>Jiangsu Key Lab. of Advanced Metallic Materials, School of Materials Science and Eng., Southeast University, Nanjing, P.R. China; <sup>2</sup>Jiangsu Key Lab. of Construction Materials, School of Materials Science and Eng., Southeast University, Nanjing, P.R. China

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## **FRIDAY JUNE 8 AFTERNOON**

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*Room:* **MAGIONE A**

### **Session CI-6 - Progress in Applications of Porous Ceramics**

*Chair:* Paolo COLOMBO, Italy

- 14.30 **CI-6:IL09 Particle-stabilized Foams: From Satellite Housings to High Performance Insulators and Fire Protection Materials**  
**U.T. GONZENBACH**, P.N. STURZENEGGER, de Cavis Ltd., Duebendorf, Switzerland
- 15.00 **CI-6:IL10 Porous Geopolymers for Indoor Humidity Control**  
**I. LANCELLOTTI<sup>1</sup>**, J. KIVENTERA<sup>2</sup>, M. ILLIKAINEN<sup>2</sup>, C. LEONELLI<sup>1</sup>,  
<sup>1</sup>Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy; <sup>2</sup>University of Oulu, Fiber and Particle Engineering, University of Oulu, Oulu, Finland
- 15.30 **CI-6:L11 Emission Studies of Hydrogen Combustion for Cooking and Heating on Catalytic Coated Ceramic Foams**  
**U.F. VOGT**, T. BUETLER, B. FUMEY, EMPA, Duebendorf, Switzerland

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## **FRIDAY JUNE 8 AFTERNOON**

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*Room:* **SPOLETO A**

### **Session CJ-5 - Fast Ion-conducting Ceramics**

*Chair:* Brahim DKHIL, France

- 14.30 **CJ-5:L05 Development and Electrical Discharge Machining of Electrical Conductive Pressure-less Sintered TiC/Al<sub>2</sub>O<sub>3</sub> Composites**  
**S. CONZE**, S. HILDEBRANDT, T. HUTZLER, L.-M. BERGER, A. MICHAELIS, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany
- 14.50 **CJ-5:L07 Properties of Shape-controlled Gadolinia-doped Ceria Nanoparticles**  
M.F.S. MACHADO, L.P.R. MORAES, L.N. RODRIGUES, T. RODRIGUES, **F. CORAL FONSECA**, Nuclear and Energy Research Institute - IPEN, Sao Paulo, SP, Brazil
- 15.10 **CJ-5:IL08 Interfacial Contributions to Mixed Ionic and Electronic Conducting (MIEC) Materials in Solid Oxide Fuel Cells, Membrane Separations and Solid-State Battery Applications**  
**K.S. BRINKMAN**, Materials Science and Engineering, Clemson University, Clemson, SC, USA
- 15.40 **CJ-5:IL09 Effects of Remnant Metastability in Nanoscaled Oxygen Ionic Conductors**  
**V. ESPOSITO**, Technical University of Denmark, Department of Energy Conversion and Storage, Roskilde, Denmark
- 16.10 **CJ-5:IL10 Design, Synthesis and Electrochemical Characterizations of Electrode Materials for Rechargeable Li-sulfur Batteries**  
**DO KYUNG KIM**, Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

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## **FRIDAY JUNE 8 AFTERNOON**

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*Room:* **NORCIA**

### **Session CL-8 - Ongoing Applications and Forecasts**

*Chair:* Maurizio FERRARI, Italy

- 14.30 **CL-8:IL01 Transparent Ceramics: Materials, Engineering Progress and Applications**  
**A.E. GOLDSTEIN**, Israel Ceramics and Silicates Institute, Haifa, Israel
- 15.00 **CL-8:IL02 Progress in Transparent Ceramic Development and its Laser Applications**  
**M. DUBINSKII**, US Army Research Laboratory, Adelphi, MD, USA
- 15.30 **CL-8:IL03 Additive Manufacturing of Ceramic and Glass Materials for Photonics Applications**  
SHUO LI<sup>1</sup>, RAN ZOU<sup>1</sup>, MOHAN WANG<sup>1</sup>, SHENG HUANG<sup>1</sup>, MING-JUN LI<sup>2</sup>, M. BURIC<sup>3</sup>, P. OHODNICKIC<sup>3</sup>, **KEVIN P. CHEN<sup>1</sup>**,  
<sup>1</sup>Department of Electrical and Computer Engineering, University of Pittsburgh, Pittsburgh, PA, USA; <sup>2</sup>Corning Incorporated, Corning, NY, USA; <sup>3</sup>National Energy Technology Laboratory, Pittsburgh, PA, USA
- 16.00 **CL-3:L04 Glass and Glass-ceramic of Silica-calcia System Doped with Eu<sup>3+</sup> Ions**  
**A. LUKOWIAK**, M. PTAK, A. HOJENSKA, W. STREK, Institute of Low Temperature and Structure Research, PAS, Wroclaw, Poland; J. KRZAK, B. BABIARCZUK, B. BORAK, Department of Mechanics, Materials Science and Engineering, Wroclaw University of Science and Technology, Wroclaw, Poland

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## **FRIDAY JUNE 8 AFTERNOON**

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*Room:* **SPELLO**

### **Session CO-6 - Composites for Thermal Management**

*Chair:* Mrityunjay SINGH, USA

**14.30 CO-6:L01 Unsteady Modelling of CVI for Production of SiC-matrix Composites**

**A.V. KULIK**, M.S. RAMM, M.V. BOGDANOV, STR Group, Inc. - Soft-Impact, Ltd., Saint Petersburg, Russia; V.I. KULIK, Baltic State Technical University, Saint Petersburg, Russia

**15.00 CO-6:L03 Interphase Creation in Cu/C Composites using an Innovative Solid-liquid Co-existent Process**

C. AZINA<sup>1,2</sup>, I. CORNU<sup>1</sup>, B. MORTAIGNE<sup>3</sup>, Y.F. LU<sup>2</sup>, **J.-F. SILVAIN**<sup>1,2</sup>,  
<sup>1</sup>Institut de Chimie de la Matière Condensée de Bordeaux (ICMCB), CNRS, Pessac, France; <sup>2</sup>Department of Electrical and Computer Engineering, University of Nebraska-Lincoln, Lincoln, NE, USA;  
<sup>3</sup>DGA/DS/Mission pour la Recherche et l'Innovation Scientifique, Paris, France

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## **POSTER PRESENTATIONS**

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# **POSTER DISCUSSION**

**FRIDAY JUNE 8: 16.30 - 18.30**

**Posters desmounting:**

(Soon after the poster discussion)

**CA:P02 Synthesis of  $\alpha$ -cordierite Powder from Preheated Kaolinite, Talc and Alumina**

**HSIN-WEN FAN**, FU SU YEN, National Cheng Kung University, Tainan, Taiwan

**CA:P03 Synthesis of NIR-reflective CoFe<sub>2</sub>O<sub>4</sub> Black Pigment Doped with CaO and Al<sub>2</sub>O<sub>3</sub> Derived from Minerals**

N. SANGWONG, M. SUWAN, **S. SUPOTHINA**, National Metal and Materials Technology Center, National Science and Technology Development Agency (NSTDA), Klong Luang, Pathum Thani, Thailand

**CA:P04 The Effect of Varying Quantity and Particle Size of Cristobalite Powders during Synthesizing Cordierite**

**YI-HSIN LIN**, FU-SU YEN, HSING-I HSIANG, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

**CA:P05 Fabrication of Translucent Alumina by Vacuum Sintering at Low Temperature**

**WEN-CHIAO HUANG**, FU-SU YEN, CHI-YUEN HUANG, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

**CA:P06  $\gamma$ + $\alpha$ -Al<sub>2</sub>O<sub>3</sub> Composite Powders for Fabricating Translucent Aluminas**

**I-TING LIU**, FU-SU YEN, M.C. TOM KUO, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

**CA:P07 Particle Size Distribution Variations Driven by Ostwald Ripening Processes**

**MENG YING LEE**, FU SU YEN, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

**CA:P08 Impact of Pressure in Static and Dynamic Pressing of Ultrafine Plasmochanical ZrO<sub>2</sub> (Y)-Al<sub>2</sub>O<sub>3</sub> Powders on Compact Density and Compaction Efficiency during Sintering**

T.S. FRANGULYAN, **S.A. GHYNGAZOV**, National Research Tomsk Polytechnic University, Tomsk, Russia

**CA:P11 Silicon Carbide Ceramics Sintering with Yb<sub>2</sub>O<sub>3</sub>-Al<sub>2</sub>O<sub>3</sub> as Additives**

**YONG JIANG**, LANER WU, North Minzu University, Xixia District, Yinchuan, China

**CA:P12 Effects of Added Nano Titanium on the Microstructure of Vitrified Bond Diamond Tools**

ZUN-KAI JHUANG<sup>1</sup>, YUO-TERN TSAI<sup>2</sup>, **KUAN-HONG LIN**<sup>1</sup>, <sup>1</sup>Department of Mechanical Engineering, Tungnan University, New Taipei City, Taiwan;

<sup>2</sup>Department of Mechanical Engineering, HungKuo Delin University of Technology, New Taipei City, Taiwan

**CA:P14 Thermal Expansion Properties and Structural Analysis of ZrW<sub>2</sub>-xMoxO<sub>8</sub>**

**HUI WEI**, SHUNSUKE MIZUTANI, MAKOTO NOGUCHI, KEISHI NISHIO,

Dept. of Materials Science and Technology, Tokyo University of Science, Tokyo, Japan; AKIHISA AIMI, KENJIRO FUJIMOTO, Dept. of Pure and Applied Chemistry, Tokyo University of Science, Chiba, Japan

**CA:P17 Peculiarities in Phase Development in the ZnO-stabilized ZrO<sub>2</sub> System**

**K. KUMAR**, A. CHOWDHURY, Dept. of Materials Science & Engineering, Indian Institute of Technology Patna, Bihta, Bihar, India

**CB:P01 Improvement of Optics, Mechanical Properties and Controlled-release Drug Delivery of Powder Cosmetics**

**YASUMASA TAKAO**, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan

**CB:P02 Study of Mechanical Properties and the Hydrothermal Behavior of Ce-TZP/Al<sub>2</sub>O<sub>3</sub> Sintered by Microwave**

L. GIL, M.D. SALVADOR, **A. BORRELL**, Instituto de Tecnología de Materiales, Universitat Politècnica de València, Valencia, Spain; A. FERNANDEZ, CINN (CSIC, Universidad de Oviedo, Principado de Asturias), El Entrego, Spain

**CB:P03 Preparation of Low Frictional Surfaces by Mimicking Firebrat's Scales**

**SHUN UEMURA**, YUJI HIRAI, MASATSUGU SHIMOMURA, Chitose Institute of Science and Technology, Chitose, Japan

**CB:P04 Evaluations of Barnacle Settlements on Self-assembled Monolayer Surfaces**

**AI MOMOSE<sup>1</sup>**, YUTA SEGAWA<sup>1</sup>, TAKAYUKI MUROSAKI<sup>2</sup>, YUJI HIRAI<sup>1</sup>, YASUYUKI NOGATA<sup>3</sup>, MASATSUGU SHIMOMURA<sup>1</sup>, <sup>1</sup>Chitose Inst. of Science and Technology, Bibi, Chitose, Japan; <sup>2</sup>Asahikawa Medical University, Asahikawa, Japan; <sup>3</sup>Central Research Inst. of Electric Power Industry, Abiko, Japan

**CB:P05 Ceramic Injection Moulding with 3D-printed Mold Inserts**

**A.J. MEDESI**, D. NÖTZEL, K. PURSCHE, T. HANEMANN, Institute for Applied Materials (IAM), Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany; M. FRANZREB, J. WOHLGEMUTH, Institute for Functional Interfaces (IFG), Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany

**CB:P13 Synthesis of ZnWO<sub>4</sub> Ceramic Powders by Chemical Method: Correlation between Structural Evolution and Photoluminescent Properties**

**I. COSTA NOGUEIRA<sup>1</sup>**, M. SOUSA DA SILVA GONDIM<sup>2</sup>, P. SANTANA LEMOS<sup>3</sup>, M. DE ASSIS<sup>3</sup>, E. LONGO<sup>3</sup>, E.R. LEITE<sup>4</sup>, <sup>1</sup>Dept. of Physics, Federal University of Amazonas - UFAM, Brazil; <sup>2</sup>Federal Institute of Education, Science and Technology of Maranhão - IFMA, Brazil; <sup>3</sup>LIEC, Federal University of São Carlos - UFSCar, Brazil; <sup>4</sup>LNNANO, National Center for Research in Energy and Materials - CNPEM, Brazil

**CB:P14 Structure, Morphology, and Optical Properties of  $\alpha$ -Ag<sub>2</sub>-2xM<sub>x</sub>WO<sub>4</sub> (M = Zn<sup>2+</sup>, and Cu<sup>2+</sup>) Solid Solutions Obtained by Coprecipitation and by Femtosecond Laser**

**P.F.S. PEREIRA**, A.F. GOUVEIA, R.C. DE OLIVEIRA, M. ASSIS, E. LONGO, E.C. CORDONCILLO, H. BELTRÁN, G.M. VEGA, CDMF, LIEC, Chemistry Dept. of Federal University of São Carlos (UFSCar), São Carlos, SP, Brazil; M. FERRER, Modeling and Molecular Simulations Group, Sao Paulo State University, Bauru, Brazil; R.M.L. BARELLES, J. ANDRÉS, Dept. of Analytical and Physical Chemistry, University Jaume I (UJI), Castellon, Spain

**CB:P19 Flash Sintering of ZrO<sub>2</sub> / Al<sub>2</sub>O<sub>3</sub> Composites**

**C. LAGO OJAIMI**, J.A. FERREIRA, USP, Pirassununga, SP, Brazil; A.S.A. CHINELATTO, A.L. CHINELATTO, UEPG, Ponta Grossa, PR, Brazil; E.M.J.A. PALLONE, USP, Pirassununga, SP, Brazil

**CC:P01 Boron Carbide/Graphene Platelet Ceramics with Improved Fracture Toughness, Functional and Tribological Properties**

**R. SEDLAK<sup>1</sup>**, A. KOVALCIKOVA<sup>1</sup>, J. BALKO<sup>1</sup>, P. RUTKOWSKI<sup>2</sup>, A. DUBIEL<sup>3</sup>, E. MUDRA<sup>1</sup>, V. GIRMAN<sup>4</sup>, J. DUSZA<sup>1</sup>, <sup>1</sup>Inst. of Materials Research, SAS, Div. Ceramic and Non-Metallic Systems, Košice, Slovak Rep.; <sup>2</sup>AGH University of Science and Technology in Krakow, Fac. Materials Science and Ceramics, Krakow, Poland; <sup>3</sup>The Inst. of Advanced Manufacturing Technology, Krakow, Poland; <sup>4</sup>Pavol Jozef Šafárik University in Košice, Fac. Science, Inst. of Physics, Dept. Condensed Matter Physics, Košice, Slovak Rep.

**CC:P03 Corrosion Protection of Ceramics Using Carbon-silver Film**

**A.A. VIEIRA<sup>1</sup>, L.A. MANFROI<sup>1</sup>, M.A. RAMIREZ<sup>1</sup>, P.A. RADI<sup>1,2</sup>, A.C. SENE<sup>1</sup>, S.F. SANTOS<sup>3</sup>, J.V. SOUZA<sup>3</sup>, L. VIEIRA<sup>1,2</sup>, <sup>1</sup>University of Paraiba Valley-UNIVAP/ IP&D, São José dos Campos, SP-Brazil; <sup>2</sup>Aeronautics Inst. of Technology, ITA/ LPP, São José dos Campos, SP-Brazil; <sup>3</sup>São Paulo State University (UNESP), School of Eng., Dept. of Materials and Technology, Guaratinguetá, SP-Brazil**

**CC:P04 Graphene Nanoplatelets Reinforced Plasma Sprayed Alumina-titania Coating with Improved Corrosion and Wear Resistances**

**B. MUKHERJEE**, R. SINGH, A. ISLAM, A. KUMAR KESHRI, Dept. of Materials Science and Engineering, Indian Institute of Technology Patna Bihta, Patna, Bihar, India

**CC:P06 Support with Bactericide Coating for Curative Accomplishment and Hygiene on Inferior Memberst**

**R. CELIA<sup>1</sup>, T. BAESSO<sup>1</sup>, A.C. SENE<sup>1</sup>, L.A. MANFROI<sup>1</sup>, A.A. VIEIRA<sup>1</sup>, P.A. RADI<sup>1,2</sup>, M.A. RAMIREZ<sup>1</sup>, N.S. DA SILVA<sup>1</sup>, L. VIEIRA<sup>1</sup>, <sup>1</sup>University of Paraiba Valley- UNIVAP/ IP&D, São José dos Campos, SP-Brazil; <sup>2</sup>Aeronautics Institute of Technology, ITA / LPP, São José dos Campos, SP-Brazil**

**CD:P01 Atomic Interface Structure of Body Centered Cubic Metal/Ceramic Interface**

**ENGANG FU**, School of Physics, Peking University, Beijing, China; J.L. DU, School of Physics, Peking University, Beijing, China; X.D. DING, School of Materials Science, Xi'an Jiaotong University, Xi'an, China

**CD:P02 Theoretical Prediction and Experimental Determination of the Phase Transformation Sequence in Al-Ni Multilayer Termite Structures**

**D.G. GROMOV**, E.A. LEBEDEV, L.I. SOROKINA, National Research University of Electronic Technology (MIET), Moscow, Zelenograd, Russia; A.YU. TRIFONOV, Lukin Research Inst. of Physical Problems, Zelenograd, Russia

**CD:P03 Investigation of Wave Combustion Processes in Multilayer Al-Ni Structures Formed on the Surface of Three-dimensional Silicon Structures**

**E.A. LEBEDEV**, D.G. GROMOV, National Research University of Electronic Technology (MIET), Moscow, Zelenograd, Russia; E.P. KITSYUK, Y.U.P. SHAMAN, Science-Manufacturing Center "Technological Centre", Moscow, Zelenograd, Russia; A.A. PAVLOV, Russian Academy of Sciences, Dept. of Development and Research of Micro- and Nanosystems, Moscow, Russia

**CE:P01 Fabrication and Mechanism of the Enhanced Mechanical Properties of Electrospun SiOC Ceramic Nanofibrous Membrane**

**YINGDE WANG**, NAN WU, BING WANG, Science and Technology on Advanced Ceramic Fibers and Composites Laboratory, National University of Defense Technology, Changsha, China

**CE:P03 Effect of Electrochemically Induced Phase Transformation on the Electrical and Mechanical Properties of Yttria-stabilized Zirconia**

**KUK-JIN HWANG**, TAE HO SHIN, Korea Institute of Ceramic Engineering and Technology, Gyeongsangnam-do, South Korea; HEESOO LEE, Pusan National University, Geumjeong-gu, Busan, South Korea

**CE:P04 ZnO Nanorods Array as Electrode for Supercapacitors and Photo-supercapacitors**

D. SOLIS<sup>1</sup>, A. BRITO<sup>1</sup>, E. NAVARRETE-ASTORGA<sup>1</sup>, E.A. DALCHIELE<sup>2</sup>, D. LEINEN<sup>1</sup>, J.R. RAMOS-BARRADO<sup>1</sup>, **F. MARTIN<sup>1</sup>**, <sup>1</sup>Laboratorio de Materiales y Superficies. Departamentos de Física Aplicada & Ingeniería Química, Universidad de Málaga, Málaga, Spain; <sup>2</sup>Instituto de Física, Facultad de Ingeniería, Montevideo, Uruguay

**CE:P05 A Novel Ultrafast Inorganic Absorbent for Micropollutants in Aquatic Systems**

**YAN XING**, JING CHENG, WEI PAN, State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, P.R. China

**CE:P06 Fabrication and Electro-catalytic Performances of Ce(Mn,Fe)O<sub>2</sub> Infiltrated La(Sr)Cr(Mn)O<sub>3</sub> Electrode**

**JISEUNG RYU**, HEESOO LEE, Pusan National University, Busan, South Korea; TAEHO SHIN, Korea Institute of Ceramic Engineering and Technology, South Korea

**CE:P08 Preparation of Polymethylsilsesquioxane Aerogels with Improved Strength Using Strong Base Catalyst**

**RYOTA UEOKA**, KAZUYOSHI KANAMORI, KAZUKI NAKANISHI, Dept. of Chemistry, Graduate School of Science, Kyoto University, Japan

**CE:P09 New Ceramic Nanoparticle-reinforced Polyacrylates Fabricated by 3D Inkjet Printing and UV-curing**

**D. GRAF**, T. HANEMANN, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Baden-Württemberg, Germany; S. BURCHARD, University of Freiburg, Freiburg, Baden-Württemberg, Germany

**CE:P10 Maximizing Thermoelectric Performance of AgPbmSbTem+2 by Optimizing Spark Plasma Sintering Temperature**

**JUN PEI<sup>1</sup>**, BO-PING ZHANG<sup>1</sup>, JING-FENG LI<sup>2</sup>, DOU-DOU LIANG<sup>1</sup>, <sup>1</sup>The Beijing Municipal Key Lab. of New Energy Materials and Technologies, School of Materials Science and Eng., University of Science and Technology Beijing, Beijing, China; <sup>2</sup>State Key Lab. of New Ceramics and Fine Processing, School of Materials Science and Eng., Tsinghua University, Beijing, China

**CE:P11 Preparation of Monolithic Porous Mg-based MOFs via Sol-gel and Solvothermal Processes**

**SEONGJU JEON**, X. LU, K. KANAMORI, K. NAKANISHI, Dept. of Chemistry, Graduate School of Science, Kyoto University, Japan

**CE:P12 CuxS Superionic Compounds: Electronic Structure and Thermoelectric Performance Enhancement**

**BO-PING ZHANG<sup>1</sup>**, LI-JUN ZHENG<sup>1,2</sup>, HE-ZHANG LI<sup>1</sup>, JUN PEI<sup>1</sup>, JIA-BING YU<sup>3</sup>, <sup>1</sup>The Beijing Municipal Key Lab. of New Energy Matls and Technologies, School of Materials Science and Eng., University of Science and Technology Beijing, Beijing, China; <sup>2</sup>School of High Temperature Matls and Magnesite Resources Eng., University of Science and Technology Liaoning, Anshan, China; <sup>3</sup>Dept. of Materials Science and Eng., Peking University, Beijing, China

**CG:P01 Microstructure Characterization of Ti-Al-C MAX Phases Obtained by SPS**

**S. SIGNE GOUMWE**, M. GONON, J.-P. ERAUW, M. DEMUYNCK, P. AUBRY, Materials Institut of University of Mons, Mons, Belgium

**CG:P02 Characterization and Simulation of Filler Element Incorporation in the Ti2AlC Ceramics**

**CHENGJIE LU<sup>1,2</sup>**, J. ZHANG<sup>1</sup>, G. HUG<sup>2</sup>, <sup>1</sup>Harbin Institute of Technology, Harbin, China; <sup>2</sup>LEM ONERA-CNRS, France

**CG:P04 Rapid Preparation and Characterization of 2D Ti3C2 Nanocrystals**

**SHUJUN HU**, S.B. LI, J.P. JIANG, J. ZHANG, J. LIU, Center of Materials Science and Engineering, School of Mechanical and Electronic Control Engineering, Beijing Jiaotong University, Beijing, China

**CH:P01 Damage Detection of Multilayer Coating System by Digital Image Correlation at High Temperature**

**RYO INOUE**, Y. KOGO, Tokyo University of Science, Tokyo, Japan; H. KAKISAWA, National Institute for Materials Science (NIMS) Ibaraki, Japan

**CH:P03 Oxidation Behavior of Ytterbium Silicides**

**TOSHIHISA MIYAZAKI**, S. USAMI, R. INOUE, Y. KOGO, Tokyo University of Science, Tokyo, Japan

**CH:P04 Silicon Carbide Based Coatings for Graphite to Increase Oxidation Resistance**

E. SALERNITANO, **F. BEZZI**, S. GRILLI, F. BURGIO, P. FABBRI, G. MAGNANI, ENEA SSPT-PROMAS-TEMAF, Lab. of Materials Technologies Faenza, Faenza (RA), Italy

**CH:P05 Use of Non-destructive Techniques for the Determination of Failure in Thermal Barrier Coatings**

L. NAVARRO<sup>1</sup>, P. CARPIO<sup>1</sup>, **M.D. SALVADOR<sup>1</sup>**, R. MORENO<sup>2</sup>, <sup>1</sup>ITM, Universitat Politècnica de València (UPV), Valencia, Spain; <sup>2</sup>ICV, Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain

**CH:P07 Application of Tungsten Oxide Thin Films for Active Gases Detection**

M.V. CHUPRIN, **O.M. IVANOVA**, S.A. KRUTOVERTSEV, L.S. KRUTOVERTSEVA, A.E. TARASOVA, CJSC "Ecological sensors and systems", Zelenograd, Moscow, Russia

**CH:P11 Wear Resistance of Plasma Sprayed Graphene Nanoplatelets Reinforced Alumina Coating in Dry and Wet Environment**

**O.S. ASIQ RAHMAN**, S. PRIYADERSHINI, A. KUMAR KESHRI, Materials Science and Eng., Indian Institute of Technology Patna, Patna, Bihar, India

**CI:P01 Preparation and Characterization of Transparent SiO<sub>2</sub> Sponges for Water Treatment**

**F. LOEFFLER**, E.C. BUCHARSKY, K.G. SCHELL, M.J. HOFFMANN, Institute for Applied Materials - Ceramic Materials and Technologies, Karlsruhe Institute of Technology, Germany

**CI:P02 Fabrication of Functional Porous Ceramics by In-situ Solidification Process for Mitigating Environmental Issues**

**TAKASHI SHIRAI**, YUNZI XIN, JEONG SOO HONG, Nagoya Institute of Technology, Nagoya, Japan

**CI:P03 Synthesis and Characterization of Ta<sub>2</sub>O<sub>5</sub> Monolith with Co-continuous Macroporous Structure via Sol-gel Routea**

**NAOTO MOCHIZUKI**, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

**CI:P04 Multiscale Controlled Fe<sub>2</sub>O<sub>3</sub> Monoliths via Polymerization-Induced Phase Separation**

**YOSUKE HARA**, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

**CI:P05 Preparation of Hierarchically Porous Cerium-based Monoliths from Metal Salt Precursor**

**SHOTA MAKIMOTO**, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

**CI:P06 Synthesis of MgO Porous Monoliths via Sol-gel Process Accompanied by Phase Separation**

**XUANMING LU**, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Kyoto, Japan

**CI:P08 Thermal and Physical Characterization of Composite Materials based on Plaster**

**S. BOUZIT**<sup>1</sup>, M. TAHA<sup>1</sup>, S. LAASRI<sup>2</sup>, L. BOUIRDEN<sup>1</sup>, <sup>1</sup>Faculty of Sciences, University of Ibn Zohr, Agadir, Morocco; <sup>2</sup>ENSA, University Chouaib Doukkali, El Jadida, Morocco

**CJ:P01 Magnetic and Dielectric Properties of Thermally Conductive Sheets Effective for Reducing Radiated Emissions from Heat Sinks**

**TAKASHI TAKEO**, N. OHTA, Mie University, Tsu, Mie, Japan; T. MATSUZAKI, Kitagawa Industries Co. Ltd., Kasugai, Aichi, Japan

**CJ:P05 Synthesis of BaTiO<sub>3</sub> Nanofibres and their Influence on the Properties of Barium Titanate Composite Fibers**

**T. SEBASTIAN**, A. MICHALEK, T. LUSIOLA, F. CLEMENS, Empa - Swiss Federal Laboratories for Materials Science and Technology, Laboratory for High Performance Ceramics, Dübendorf, Switzerland

**CJ:P07 Electrical Properties of ZrO<sub>2</sub> Added Lithium-titanium-zinc Ferrite Ceramics**

**E. LYSENKO**, A. SURZHIKOV, S. NIKOLAEVA, Tomsk Polytechnic University, Tomsk, Russia

**CJ:P10 Local Electrostatic and Ferroelectric Properties of P(VDF-TrFE)/ Graphene and P(VDF-TrFE)/ Graphene Oxide Composite Nanofibers**

**M.V. SILIBIN**<sup>1</sup>, V.S. BYSTROV<sup>1,2</sup>, D. KARPINSKY<sup>1,3</sup>, P. MIRZADEH<sup>4</sup>, P.A.P. MARQUES<sup>4</sup>, N. NASANI<sup>4</sup>, G. GONCALVES<sup>4</sup>, B.A. SINGH<sup>4</sup>, I.K. BDIKIN<sup>1,4</sup>, <sup>1</sup>National Research University of Electronic Techn., Zelenograd, Moscow, Russia; <sup>2</sup>Inst. Mathematical Problems of Biology, Keldysh Inst. of Applied Mathematics RAS, Pushchino, Moscow, Russia; <sup>3</sup>Scientific-Practical Materials Res. Centre of NAS of Belarus, Minsk, Belarus; <sup>4</sup>TEMA-NRD, Mech. Eng. Dept. and Aveiro Inst. of Nanotechnology (AIN), Univ. of Aveiro, Aveiro, Portugal

**CJ:P11 Development and Application of Hybrid Materials Obtained by In situ and Ex situ Synthesis**

**C. VENEGAS**<sup>1,2</sup>, S. BOLLO<sup>1</sup>, D. RUIZ<sup>2</sup>, <sup>1</sup>Universidad de Chile, Santiago, Chile; <sup>2</sup>Universidad de Santiago de Chile, Santiago, Chile

**CJ:P13 Electrical Characterization of SrTiO<sub>3</sub> Solid Solution with Pr<sup>3+</sup> and Zr<sup>4+</sup>**

**G. LOPEZ-PACHECO**, A. REYES-MONTERO, M.E. VILLAFUERTE-CASTREJÓN, Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Ciudad de México, México; F. GONZÁLEZ-GARCÍA, Depto de Ingeniería de Procesos e Hidráulica, Universidad Autónoma Metropolitana, Ciudad de México, México

**CK:P17 Structural, Dielectric and Optical Analysis of Li<sub>2</sub>O–Nb<sub>2</sub>O<sub>5</sub>–TiO<sub>2</sub> Based Dielectric Ceramics**

**S. BAHEL**, R. SINGH, Dept. of Electronics Technology, GND University, Amritsar, India

**CK:P01 Multiglass Property in the Multiferroic Spin-chain Compound Sm<sub>2</sub>BaNiO<sub>5</sub>**

**A. INDRA**, K. DEY, S. GIRI, Dept. of Solid State Physics, Indian Association for the Cultivation of Science, Jadavpur, Kolkata, India

**CK:P03 Crystal and Magnetic Structure of Bi<sub>1-x</sub>LaxFe<sub>1-y</sub>MnyO<sub>3</sub> Ceramics**

**S. DUBKOV**<sup>1</sup>, D.V. KARPINSKY<sup>1,2</sup>, I.O. TROYANCHUK<sup>1,2</sup>, M.V. SILIBIN<sup>1</sup>, V.A. KHOMECHENKO<sup>3</sup>, <sup>1</sup>National Research University of Electronic Technology "MIET", Zelenograd, Moscow, Russia; <sup>2</sup>Scientific-Practical Materials Research Centre of NAS of Belarus, Minsk, Belarus; <sup>3</sup>CFisUC, Dept. of Physics, University of Coimbra, Coimbra, Portugal

**CL:P02 Crystal Structure, Electronic Structure, and Photoluminescence Properties of Eu<sup>3+</sup> Doped (Li,Na,K)LaMgWO<sub>6</sub> Red Phosphors**

WEIGUANG RAN<sup>1</sup>, JUNG HYUN JEONG<sup>1</sup>, KIWAN JANG<sup>2</sup>, HO SUEB LEE<sup>2</sup>, <sup>1</sup>Dept. of Physics, Pukyong National University, Busan, South Korea; <sup>2</sup>Dept. of Physics, Changwon National University, Changwon, South Korea

**CL:P03 Direct-write Photolithography for Rapid Prototyping of Silicon Nitride Waveguides on Silicon**

**D.B. BONNEVILLE**, H.C. FRANKIS, J.D.B. BRADLEY, Dept. of Engineering Physics, McMaster University, Hamilton, Ontario, Canada

**CL:P05 Cataion Exchange Mediated Synthesis of Ternary Alloyed Plasmonic Cu<sub>3</sub>Bi<sub>2</sub>S<sub>3</sub>-xSex Nanorods**

**S. PAUL**, S.K. DE, Dept. of Materials Science, Indian Association for the Cultivation of Science, Kolkata, India

**CM:P01 Densification Behavior of Clay Brick Body Incorporated with Coffee Grounds Waste**

K.A. VASCONCELLOS, P.F. BUSCH, **J.N.F. HOLANDA**, Group of Ceramic Materials/LAMAV, Northern Fluminense State University - UENF, Campos dos Goytacazes, RJ, Brazil

**CM:P02 Study of Industrial WastesTreated by Hydrocyclones for Use in Ceramic Mass Formulations**

A. ARAUJO, L. CAMPOS, D. MACEDO, **R. DUTRA**, Federal University of Paraíba, João Pessoa, Paraíba, Brazil

**CM:P03 Pigmented Glazed Ceramic Roof Tiles: Optical Behavior Using the Kubelka-Munk Model in Solar Spectrum Range**

**L.M. SCHABBACH**, M. FREDEL, CERMAT - UFSC, Florianopolis, Santa Catarina, Brazil; D.L. MARINOSKI, S. GÜTHS, CB3E - UFSC, Brazil; A.M. BERNARDIN, UNESC, Brazil

**CN:P01 High-temperature Ceramic Sensors for Assessing Refractory and Component Conditions**

**K. SABOLSKY**, G.A. YAKABOYLU, K.A. SIERROS, E.M. SABOLSKY, M.R. COMPARETTO, D.S. REYNOLDS, West Virginia University, Morgantown, WV, USA; J. BOGAN, M. RAUGHLEY, J. SAYRE, Harbison Walker International Technology Center, West Mifflin, PA, USA

**CO:P02 In Situ Fabrication of SiC Fibers with Controllable Carbon Layer for Excellent High-temperature Resistance**

**YANZI GOU**, HAO WANG, JUN WANG, National University of Defense Technology, Changsha, China

**CO:P03 Nanocomposites of Pseudoboehmite Polystyrene**

A.H. MUNHOZ JR., **M.A. SOUZA VASCONCELOS**, R.M. PERES, T.J. MASSON, L.F. MIRANDA, R. OLIVEIRA, Univ. Presbiteriana Mackenzie, São Paulo, SP, Brazil; H.T.T.S. MELO, UNIGEL, São Paulo, SP, Brazil

**CO:P04 Effect of CVI C Layer's Thickness on Mechanical Properties of**

**C/C-SiC Composites Prepared by Gaseous Silicon Infiltration Process**

**RONGJUN LIU**, HUAMING MIAO, Science and Technology on Advanced Ceramic Fibers and Composites Laboratory, National University of Defense Technology, Changsha, China

**CO:P05 High-temperature Stability of Carbon Fiber Reinforced Polymer-derived SiAlOC Composites under Different Environment**

**QINGSONG MA**, T.H. XU, CFC Key Laboratory, National University of Defense Technology, Changsha, China

## HOT POSTERS

**CA:HP19 Effect of Tb<sup>3+</sup> doping and Self-generated Pressure on the Crystallographic/Morphological Features and Thermal Stability of LaPO<sub>4</sub>·nH<sub>2</sub>O Single-Crystal Nanorods Obtained by Microwave-Assisted Hydrothermal Synthesis**

**M.T. COLOMER**<sup>1</sup>, A.L. ORTIZ<sup>2</sup>, <sup>1</sup>Instituto de Cerámica y Vidrio, CSIC, Madrid, Spain; <sup>2</sup>Depto de Ingeniería Mecánica, Energética y de los Materiales, Universidad de Extremadura, Badajoz, Spain

**CA:HP20 Translucent High Strength Glass-ceramic Nanocomposite for Dental Restoration**

**LE FU**, H. ENGVIST, **WEI XIA**, Div. Applied Materials Science, Dept. of Engineering Sciences, Uppsala University, Fagersta, Sweden

**CA:HP21 Effect of Plasma Treatment of Polymeric Tape Carriers on Wetting Behaviour of Aqueous Ceramic Tape Casting Slurry**

**M. TRUNEC**<sup>1</sup>, P. STASTNY<sup>1</sup>, J. KELNAR<sup>2</sup>, M. PAZDERKA<sup>2</sup>, <sup>1</sup>CEITEC BUT, Brno University of Technology, Brno, Czech Republic; <sup>2</sup>CEPLANT, Dept. of Physical Electronics, Masaryk University, Brno, Czech Rep.

**CA:HP22 Production and Properties of  $\alpha$ -TCP containing Bioactive Glass-ceramics**

**A. DOBRADI**, M. ENISZ-BODOGH, K. KOVACS, Institute of Materials Engineering, University of Pannonia, Veszprem, Hungary

**CB:HP22 SHS of Advanced Borosilicide High-temperature Ceramics**

**Yu.S. POGOZHEV**, A.Yu POTANIN, S. VOROTILO, V.V. KURBATKINA, E.A. LEVASHOV, National University of Science and Technology "MISIS", Moscow, Russia

**CB:HP23 Toward Better Conversion in Magnesiothermic Synthesis of Zirconium Diborides**

**S. CORDOVA**, E. SHAFIROVICH, The University of Texas at El Paso, El Paso, TX, USA

**CB:HP24 3D Engineered Photoanodes for Dye-sensitized Solar Cells**

**A. SANGIORGI**<sup>1,2</sup>, A. SANSON<sup>1</sup>, <sup>1</sup>ISTEC-CNR, Faenza, Italy; <sup>2</sup>Dept. of Chemistry, University of Parma, Parco Area delle Scienze, Parma , Italy

**CB:HP25 Synthesis of Kaolinite-methanol and Kaolinite-cetyltrimethylammonium Chloride Complexes using Solvothermal Methods**

**A. KOVACS**, E. MAKÓ, Institute of Materials Engineering, University of Pannonia, Veszprem, Hungary

**CB:HP26 Multi-phase Armor Production and Characterisation Involving B4C – SiC – TiC with Spark Plasma Sintering Technique**

**G. UYSAL SAPANCI**, G. DARA, D. AKKUŞ KÜRÜM, S. TURAN, F. KARA, A. KARA, Roketsan Inc., Ankara, Turkey

**CD:HP07 Large Area Bonding Technology by using Solid Porous Ag in Die-attached Modules**

**CHUANTONG CHEN**, CHANYANG CHOE, KATSUAKI SUGANUMA, Osaka University, Osaka, Japan

**CD:HP08 Joining and Mechanical Testing of Oxide/Oxide (Nextel TM 610/alumina-zirconia) Ceramic Composite**

**M.Y. AKRAM**<sup>1</sup>, M. FERRARIS<sup>1</sup>, V. CASALEGNO<sup>1</sup>, G. PUCHAS<sup>2</sup>, W. KRENKEL<sup>2</sup>,

S. ROSZEITIS<sup>3</sup>, <sup>1</sup>DISAT, Politecnico di Torino, Torino, Italy; <sup>2</sup>Dept. of Ceramic Materials Eng., University of Bayreuth, Bayreuth, Germany; <sup>3</sup>Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany

**CD:HP09 Brazing Joining of C/SiC to Ti6Al4V and the Joint Strength Improvement by Surface Modification**

**M.K. BANGASH**, V. CASALEGNO, M. FERRARIS, Dept. of Applied Science and Technology, Politecnico di Torino, Torino, Italy

**CD:HP10 Joining of Monolithic Ceramics (SiC, Alumina, Mullite) by "RM-Wrap"**

**P.K. GIANCHANDANI**, V. CASALEGNO, M. FERRARIS, DISAT-Dept. of Applied Science and Technology, Politecnico di Torino, Torino, Italy

**CE:HP14 Preparation of Polyvinylpolymethylsiloxane Aerogels with High Bending Strength and Flexibility**

**M. KURITA**, G. ZU, K. KANAMORI, K. NAKANISHI, Dept. of Chemistry, Graduate School of Science, Kyoto University, Japan

**CE:HP15 Properties of Mesoporous Silica Aerogel Powders Synthesized by Using a New Gelation Agent**

SO-YEON HEO, SANG-EUN LEE, HYE-IN GO, CHANG-KOOK HONG, JIN-SEOK LEE, **YOUNG-SOO AHN**, Korea Institute of Energy Research, Daejeon, South Korea

**CE:HP16 Atomic Scale Structural Evolution of Co-W Bimetallic Nanoparticles for SWCNTs Catalyst**

**AKIHITO KUMAMOTO**<sup>1</sup>, HUA AN<sup>2</sup>, TAIKI INOUE<sup>2</sup>, SHOHEI CHIASHI<sup>2</sup>, YUICHI IKUHARA<sup>1</sup>, RONG XIANG<sup>2</sup>, SHIGEO MARUYAMA<sup>2,3</sup>; <sup>1</sup>Institute of Engineering Innovation, The University of Tokyo, Tokyo, Japan; <sup>2</sup>Dept. of Mechanical Engineering, The University of Tokyo, Tokyo, Japan; <sup>3</sup>Energy NanoEngineering Laboratory, AIST, Tsukuba, Japan

**CF:HP06 Carbide Nanocomposite TiC-SiC for Bulk Solar Absorbers Applications**

**H. ARENA**, G. ARRACHART, M. COULIBALY, A. SOUM-GLAUDE, A. JONCHERE, A. MESBAH, N. PRADEILLES, A. MAITRE, X. DESCHANELS, CNRS, ICSM-UMR 5257, Bagnols sur Ceze, France

**CG:HP06 Non-conventional Synthesis of New MAX Phases**

**L. BISCHOFF**, C.M. HAMM, J.P. SIEBERT, C.S. BIRKEL, Technische Universitaet Darmstadt, Darmstadt, Germany

**CG:HP07 Synthesis, Structure and Catalytic Properties of a New Member of the MXene Family: V4C3Tx**

**MINH HAI TRAN**, T. SCHAEFER, C.S. BIRKEL, Technische Universitaet Darmstadt, Darmstadt, Germany

**CG:HP08 Zr and Nb based MAX Phases as Accident Tolerant Fuel Cladding**

**D. BOWDEN**<sup>1</sup>, J. WARD<sup>1</sup>, T. UNGAR<sup>1,2</sup>, S. SHAH<sup>3</sup>, S. DE MORAES SHUBEITA<sup>1</sup>, T. LAPAUW<sup>4</sup>, J. VLEUGELS<sup>4</sup>, K. LAMBRINOU<sup>5</sup>, E. ZAPATA-SOLVAS<sup>6</sup>, M. PREUSS<sup>1</sup>, P. FRANKEL<sup>1</sup>; <sup>1</sup>The University of Manchester, UK; <sup>2</sup>Eötvös University Budapest, Hungary; <sup>3</sup>University of Cambridge, UK; <sup>4</sup>KU Leuven, Belgium; <sup>5</sup>SCK•CEN, Belgium; <sup>6</sup>Imperial College London, UK

**CG:HP09 Electronic and Vibrational Properties of 3D MAX Phases and 2D MXenes: From Experiments to First-principles Modeling**

**A. CHAMPAGNE**, L. SHI, T. OUISSE, B. HACKENS, F. BOUDAROT, P. BOURGES, P. PIEKARZ, D. PINEK, I. GÉLARD, M.W. BARSOUM, J.-C. CHARLIER, Université Catholique de Louvain, Louvain-la-Neuve, Belgium

**CG:HP10 Tracking Phase Changes by In-situ Resistivity Measurements of Amorphous Cr2AlC Thin Films at High Temperatures**

**B. STELZER**, X. CHEN, P. BLIEM, J.M. SCHNEIDER, Materials Chemistry, RWTH Aachen University, Aachen, Germany

**CG:HP11 Low Temperature Synthesis of Crystalline MoAlB Coatings by Combinatorial Direct Current Magnetron Sputtering**

**J. ACHENBACH**, M. HANS, D.J. MILJANOVIC, J.M. SCHNEIDER, Materials Chemistry, RWTH Aachen University, Aachen, Germany; D. PRIMETZHOFER, Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden

**CH:HP14 Oxidation Resistance Characteristics of SiC-coated Carbon Composites using Polycarbosilane**

SU-BIN AHN, JUNG-WON BANG, YOONJOO LEE, YOUNGHEE KIM, **WOOTECK KWON**, Korea Institute of Ceramic Engineering and Technology, Jinju-Si, South Korea

**CH:HP15 Nanoparticles Deposition by Plasma Gas Condensation Process**

I. CARVALHO<sup>1,2</sup>, S. CALDERON V.<sup>4</sup>, P. J. FERREIRA<sup>4,5</sup>, A. CAVALEIRO<sup>1,2</sup>, **S. CARVALHO**<sup>1,3</sup>, <sup>1</sup>SEG-CEMMPRE Mechanical Engineering Dept., University of Coimbra, Coimbra, PT; <sup>2</sup>IPN-LED&MAT Instituto Pedro Nunes, Lab. for Wear, Testing & Materials, Coimbra, PT; <sup>3</sup>UCFUniversity of Minho, Dept. of Physics, Campus of Azurém, Guimarães, PT; <sup>4</sup>INL - International Iberian Nanotechnology Lab., Braga, Portugal; <sup>5</sup>Materials Science and Engineering Program, The University of Texas at Austin, Austin, Texas, USA

**CJ:HP18 Fabricating Polymer-ceramic Composite Films via EPD**

**M. FREY**<sup>1</sup>, E. CRUZ<sup>1</sup>, M. MAUCK<sup>1</sup>, T. HANEMANN<sup>1,2</sup>, <sup>1</sup>University of Freiburg, Dept. of Microsystems Engineering - Lab. for Materials Processing, Freiburg, Germany; <sup>2</sup>Karlsruhe Institute of Technology, Institute of Applied Materials, Karlsruhe, Germany

**CM:HP05 Processing and Characterization of Composites with an Acid Based-geopolymer Matrix**

**V. MATHIVET**<sup>1</sup>, J. JOUIN<sup>1</sup>, H. CELERIER<sup>1</sup>, N. TESSIER-DOYEN<sup>1</sup>, S. ROSSIGNOL<sup>1</sup>, M. PARLIER<sup>2</sup>, <sup>1</sup>IRCER, Centre Européen de la Céramique, Limoges cedex, France; <sup>2</sup>ONERA, Châtillon, France

**CM:HP06 Lightweight Ceramic Tiles for the Production of Ventilated Façades: Control and Prediction of the Porosity-property Relations**

**C. MOLINARI**, C. ZANELLI, G. GUARINI, M. DONDI, CNR-ISTEC Istituto di Scienze e Tecnologia dei Materiali Ceramicci, Faenza, Italy

**CM:HP07 LWAs from Local Clay and Agro-food or Post Consumption Residues for Green Roof or Agronomic Application**

**F. ANDREOLA**, L. BARBIERI, R.D. FARÍAS, I. LANCELLOTTI, Università degli Studi di Modena e Reggio Emilia, Modena, Italy

**CM:HP08 Green Thinking in the Ceramic Industry-porcelain Stoneware Tiles from Low-impact Raw Materials**

C. MUGONI, M. LASSINANTTI GUALTIERI, D. SETTEMBRE, A.M. FERRARI, **C. SILIGARDI**, Dept. of Engineering Enzo Ferrari, University of Modena and Reggio Emilia, Italy; Dept. of Sciences and Methods for Engineering, University of Modena and Reggio Emilia, Italy; \*Gruppo Ceramiche Gresmalt SpA, Casalgrande (RE), Italy

**CM:HP09 Manufacture of Alkali Activated Cements through Mechanochemical Activation from Kaolins with Different Halloysite Content**

**I. BALCZAR**, T. KORIM, Institute of Materials Engineering, University of Pannonia, Veszprem, Hungary

**CM:HP10 Alkali Activated Cement Foam Blends Based on Metakaolinite and Ground Granulated Blast Furnace Slag**

**A. BOROS**, T. KORIM, I. BALCZAR, Institute of Materials Engineering, University of Pannonia, Veszprem, Hungary

**CO:HP06 Pathways for Engineering Boron Nitride Nanotube Based High-Strength Metal Matrix Composites**

**P. NAUTIYAL**, B. BOESL, A. AGARWAL, Plasma Forming Laboratory Dept. of Mechanical and Materials Engineering, Florida International University, Miami, FL, USA

**CO:HP07 Ablation Mechanism of 3D-Needled C/SiC Composites in Combustion Chamber of Rocket Engine**

CHAO CHEN<sup>1</sup>, **JIANZHANG LI**<sup>2</sup>, XIAOYING LIU<sup>1</sup>, BO CHEN<sup>1</sup>, JIAMIN WANG<sup>2</sup>, LAIFEI CHENG<sup>1</sup>, LITONG ZHANG<sup>1</sup>, <sup>1</sup>Science and Technology on Thermostructural Composite Materials Laboratory, Northwestern Polytechnical University, Xi'an, China; <sup>2</sup>National Engineering Research Center of Ceramic Matrix Composite Manufacture Technology, Xi'an Golden Mountain Ceramic Composites Co., Ltd., Xi'an, Shaanxi, China

## *Notes*

# ***Publication Policy***

Authors at CIMTEC 2018 may submit their contribution to any journal or other media sources they find appropriate.

However they have the opportunity to submit their papers for publication in special issues of Elsevier-TechnaGroup journal "Ceramics International"

<https://www.journals.elsevier.com/ceramics-international>

and in its parent journal "Ceramics in Modern Technologies"

[https://www.technagroup.it/journals\\_and\\_magazines/ceramics\\_in\\_modern\\_technologies](https://www.technagroup.it/journals_and_magazines/ceramics_in_modern_technologies)

A window for papers uploading will be opened at both journal websites as from June 15 to July 15. We regret that late submissions will not be considered.

## **SUBMISSION INFORMATIONS**

- 1- Only papers presented at CIMTEC 2018 by Authors who attended the conference may be submitted.
- 2- The Corresponding Author for the submitted paper shall be the one registered at the Conference as Presenting Author for the paper.
- 3- The Code Number assigned to the paper shall be mandatorily reported at the end of the title of the submitted paper.  
*Example: Iron Boride Coatings for Wear and Corrosion Resistance Applications (CH-5:IL02).*  
If the Code Number is not indicated, the paper will not be recognized as a CIMTEC 2018 contribution with the risk to be rejected without peer review.
- 4- All papers will be subjected to a single blind peer review process.

*The following submission options are available:*

### **- 14th International Ceramics Congress**

Symposia from CA to CL, Focused Session CB-8 and Conference CO  
Contributions primarily dealing with basic science, materials properties and properties/processing relationships are most appropriate for submission to "Ceramics International" whereas advanced manufacturing- and application-oriented contributions are most appropriate for submission to "Ceramics in Modern Technologies". It is up to Authors to choose to which Journal submit their contribution, but Journal Editors may redirect any submitted paper to the more appropriate Journal.

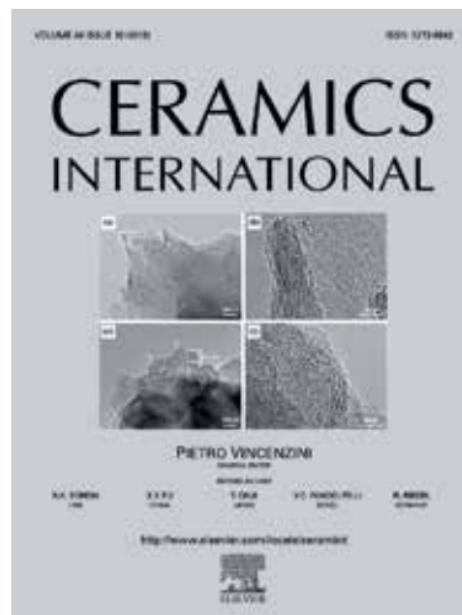
### Symposia CM and CN, and Focused Sessions CB-9 and CB-10

All contributions can be submitted to "Ceramics in Modern Technologies"

### **- 8th Forum on New Materials**

Contributions presented at all Symposia and Conferences of the Forum dealing with ceramics (i.e. oxide and non-oxide ceramics, inorganic glasses, new nanocarbons, composites and hybrids) may be submitted to "Ceramics International" if dealing primarily with basic aspects of materials science and to "Ceramics In Modern Technologies" if addressing matter most related to developments in processing, devices and application engineering.

# Ceramics International



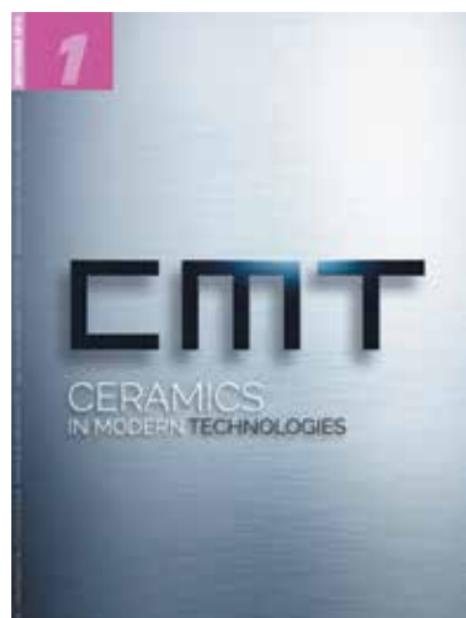
*Ceramics International* is particularly keen to attract papers which deal with fundamental scientific aspects that are relevant to the development of the whole range of advanced ceramics including e.g. phase equilibria and transformations, reactivity, transport processes, thermodynamic and electronic properties, as well as quantum effects in low dimensional materials. The journal encourages contributions that demonstrate how an understanding of the basic

chemical and physical phenomena may direct materials design and stimulate ideas for new or improved processing techniques, in order to obtain materials with desired structural features and properties.

*Ceramics International* covers oxide and non-oxide ceramics, functional glasses, glass ceramics, amorphous inorganic non-metallic materials (and their combinations with metal and organic materials), in the form of particulates, dense or porous bodies, thin/thick films and laminated, graded and composite structures. Technologically relevant low-dimensional systems are a particular focus of *Ceramics International*. These include 0, 1 and 2-D nanomaterials (also covering CNTs, graphene and related materials, and diamond-like carbons), their nanocomposites, as well as nano-hybrids and hierarchical multifunctional nanostructures that might integrate molecular, biological and electronic components.

Process related topics such as ceramic-ceramic joints or joining ceramics with dissimilar materials, as well as surface finishing and conditioning are also covered. Besides traditional processing techniques, manufacturing routes of interest include innovative procedures benefiting from externally applied stresses, electromagnetic fields and energetic beams, as well as top-down and self-assembly nanotechnology approaches. In addition, the journal welcomes submissions on bio-inspired and bio-enabled materials designs, experimentally validated multi scale modelling and simulation for materials design, and the use of the most advanced chemical and physical characterization techniques of structure, properties and behaviour.

# *Ceramics in Modern Technologies*



*Ceramics in Modern Technologies* publishes original fully peer-reviewed papers on functionalization, industrialization and application of:

- advanced oxide and non-oxide ceramics
- traditional silicate ceramics,
- industrial refractories
- new nanocarbons and other low dimensional nanostructures
- smart and special glasses
- new cements including geopolymers
- inorganic synthetic zeolites and pillared materials

All major users areas are covered such as energy and environment, electronics, optics and communications, aerospace and transport, construction, building, processing industry, mechanical and high temperature engineering, and the biomedical field.

Primary interest is for experimental and theoretical contributions dealing with materials functionalization and industrialization, new device architectures, system integration, on-service performance, in-situ and non destructive testing, as well as on experimentally validated multiscale modelling and simulation of processes, devices and performance.

The design, realization and testing of prototype products and devices, pilot scale demonstrations, case studies and cost models perfectly fit the scopes of the journal as well as aspects of green manufacturing and of proper management of materials, energy and labour resources, including waste recycling and disposal.

The journal also encourages critical reviews on still developing fields of processing and application, analyses of the drivers for innovation and of barriers to commercialization coming from alternative materials technologies.

# *Social Programme*

## *Welcome Party Chiostro Maggiore del Monastero di San Pietro*

*Tuesday June 5  
20.30 - 22.00*

The monastery was created around 102 over the former cathedral church, seat of Perugia's bishops, existing since the early seventh century, although the first document citing the abbot is from 1002. Its early patron was Pietro Vincioli, a Perugian noble, later canonized. In the following centuries the abbey increased greatly its power, until in 1398 it was burnt by the Perugini, as the abbot Francesco Guidalotti had taken part in the plot against Biordo Michelotti, chief of the



popular party. The monastery refloished with Pope Eugene IV, who united it to the Congregation of St. Justine of Padua, maintaining a position of prestige and power in the city. The abbey was temporarily suppressed by the French in 1799. The monks had aided the Perugine revolt of 1859 against the Papal government, and, after the Unification of Italy, the new government allowed them to remain in the Abbey. The Abbey has two more cloisters: one, called Chiostro Maggiore, is a Renaissance construction attributed to Guido da Settignano, another, also known as Chiostro delle Stelle, is from 1571.

At the Welcome Party delegates will enjoy a variety of renowned Umbria traditional dishes and drinks in an elegant and friendly environment.

*Entrance ticket for non-registered companions: 30.00 EUR*

## **Concert "Opera Gran Gala" Teatro Morlacchi**

**Thursday June 7  
21.30 - 23.30**

The "Opera Gran Gala" will be performed by the renowned "Lucca Philharmonic Orchestra" at the magnificent Teatro Morlacchi in Perugia. The Orchestra is composed of about sixty players. Singers: *Soprano* Francesca Maionchi and Cristina Martufi; *Tenors* Simone Frediani and Mattia Nebbiai. *Master conductor*: Andrea Colombini.

The programme will include pieces by: W.A. Mozart, G. Verdi, G. Puccini and R. Leoncavallo.



*Entrance ticket for non-registered companions: 30.00 EUR (subjected to place availability)*

## ***Conference Dinner***

### ***Chiostro di Santa Giuliana***

*Friday June 8*  
20.30 - 23.00

The Conference Dinner will take place at the St' Giuliana Cloister (Chiostro di Santa Giuliana). The Cloister is part of the monumental complex of St' Giuliana erected around the year 1253 and now the seat of the School for Foreign Languages of the Italian Army. The splendid cloister by architect Matteo Gattapone constitutes one of highest examples of "circestence" architecture in Italy and is characterized by wide white arches supported by octagonal pillars with pink and white stripes, also including some capitals remnants of previous Roman building.



*Entrance ticket for non-registered companions: 60.00 EUR (subjected to place availability)*

# *Optional Tours*

## **PERUGIA, PASSIGNANO & TRASIMENO LAKE**

*Tuesday June 5, full day  
9.30 - 19.00*

Perugia (<https://en.wikipedia.org/wiki/Perugia>) is the capital city of the Umbria region in central Italy, crossed by the river Tiber. It is located about 170 km north of Rome, and 150 km south-east of Florence. It covers a high hilltop and part of the valleys around the area.

The history of Perugia goes back to the Etruscan period. Perugia was one of the main Etruscan cities. The city is also known as the universities town, with the University of Perugia founded in 1308 (about 34,000 students), the University for Foreigners (5,000 students), and some smaller colleges such the Academy of Fine Arts "Pietro Vannucci" (Italian: Accademia di Belle Arti "Pietro Vannucci") public athenaeum founded in 1573, the Perugia University Institute of Linguistic Mediation for translators and interpreters, the Music Conservatory of Perugia, founded in 1788, and others Institutes. There are annual festivals and events: the Eurochocolate Festival (October), the Umbria Jazz Festival (July), and the International Journalism Festival (April).

Perugia is a well-known cultural and artistic centre of Italy. The famous painter Pietro Vannucci, nicknamed Perugino, was a native of Città della Pieve near Perugia. He decorated the local Sala del Cambio with a beautiful series of frescoes; eight of his pictures can also be admired in the National Gallery of Umbria. Perugino was the teacher of Raphael, the great Renaissance artist who produced five paintings in Perugia (today no longer in the city) and one fresco. Another famous painter, Pinturicchio, lived in Perugia. Galeazzo Alessi is the most famous architect from Perugia. The city symbol is the griffin, which can be seen in the form of plaques and statues on buildings around the city.

The tour includes:

- Corso Vannucchi (main Perugia street)
- Historical buildings:  
Palazzo dei Priori and  
Sala dei Notari
- Cathedral
- Main Fountain (Fontana Maggiore)
- Etruscan Arch
- Mediaeval alleys and panoramic views



*Served Lunch: Restaurant in Passignano sul Trasimeno*

Passignano sul Trasimeno (Passignano on Trasimeno Lake) is placed on the lakeshores. The town was built in between the 16th and the 17th Century whereas its suggestive historical centre surrounding the fortress dates back to medieval and also to



most ancient times. After a view of the historical centre, participants will take a ferry to visit Isola Maggiore, the biggest island of Lake Trasimeno.

The lake is south of the river Po and north of the nearby river Tiber. Only two minor streams flow directly into the Lake and none flows out. The water level of the lake fluctuates significantly according to rainfall levels and the seasonal demands from the towns, villages and farms near the shore. The first civilization to inhabit this area was the Etruscans; three of the main Etruscan cities - Perugia, Chiusi, and Cortona - are within 20 kilometres (12 miles) of the lake. Little physical evidence remains from the period of Etruscan or later Roman settlement. Castiglione del Lago, has some Roman ruins and its main streets are structured like a chessboard in the Roman style. The lake includes three islands: Isola Maggiore, Isola Polvese and Isola Minore.



*Meeting point: Centro Congressi Quattrotorri at 9.00. Return to Perugia at about 19.00.*

*The participation fee (70.00 EUR) includes bus transfer, English speaking hostess and local guides, served lunch and ferry ticket.*

## **SPOLETO & MONTEFALCO**

*Wednesday June 6, full day  
9.30 - 19.00*

Spoletos, (Latin Spoletium) is an ancient city in the Perugia district located at the head of a large, broad valley, surrounded by mountains. The town has long occupied a strategic geographical position. It appears to have been an important town to the original Umbri tribes, who built walls around their settlement in the 5th century BC, some of which are visible today. An ancient Roman colony, after Ostrogoth



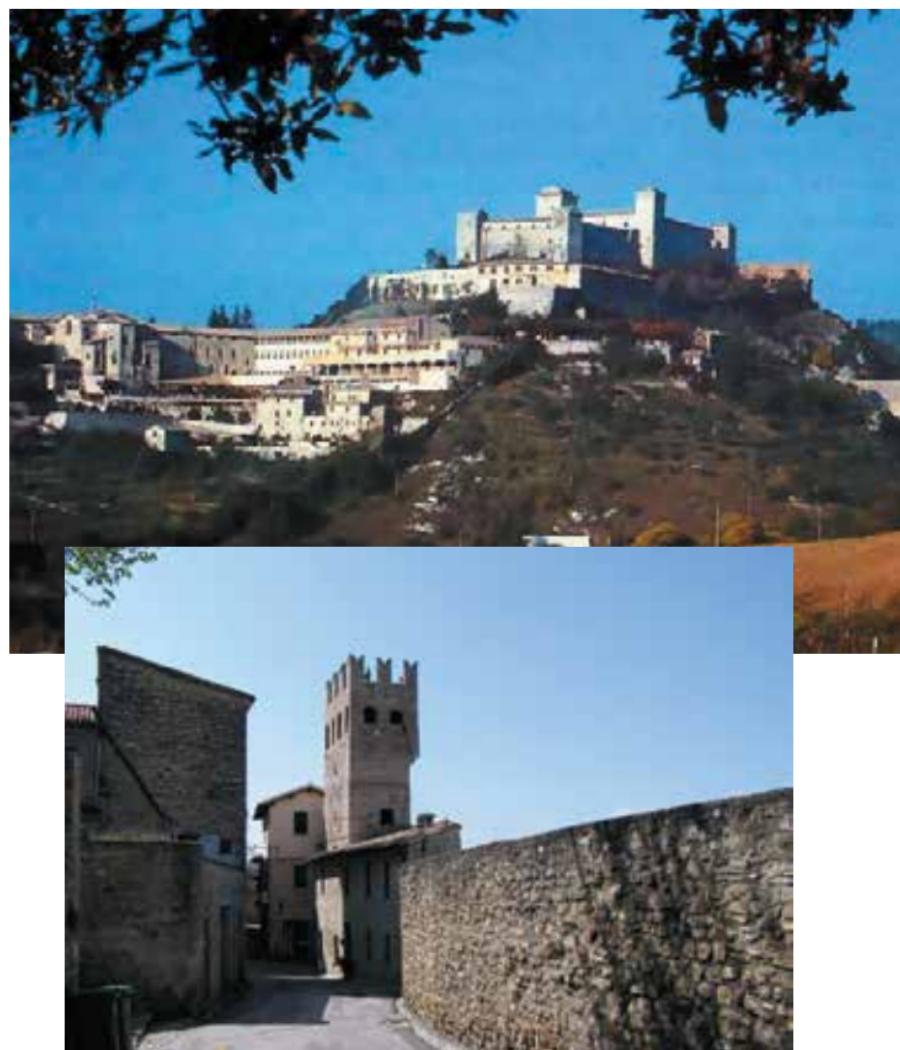
and Lombard, medieval town contended between the Pope and the Emperor, between Guelfs and Ghibellines, cultural centre during the Renaissance and Bishop seat, the history of the City has left an exceptional architectonic and art cultural heritage within a splendid naturalistic context. The Acquedotto delle Torri (Towers Aqueduct) with its majesty and beauty welcomes us when joining Spoleto.

The tour includes:

- Town walls, "Torre dell'Olio" (Oil Tower) and Porta Fuga (Fuga Door)
- Roman Theatre
- Domus of Flavia Vespasia Pollia Domus, mother of Roman Emperor Vespasiano
- Arco di Druso (Arch of Drusus)
- Roman church of Sant'Eufemia
- Cathedral square
- Ponte delle torri (Tower Bridge) connecting the historical centre. The bridge, built in between the 12th and 13th Century, is 280 meters long and 82 meters high.

*Lunch: Restaurant in Spoleto*

Montefalco, a charming tow built on a hill overlooking the valley linking Perugia with Spoleto, has been settled since the times of the Umbri. It has been under the successive domination of the Romans, Lombards, being called Coccorone in the Middle Ages. In 1249 it



was sacked by Frederick II, but was soon rebuilt with the modern name. From the 13th century it had been a free comune under the domination of local nobles and merchants, but later, as with many other Umbrian locales, the comune gave way to government by a signoria (1383-1439). In 1446 it fell under the rule of the Papal States where it remained until the unification of Italy in 1861. Montefalco has several churches, some in the Romanesque, some in the Gothic and some in the Renaissance style. The 13th century Palazzo Comunale ("Town Hall") has a mullioned window from the original edifice and a 15th-century portal. Also notable are the gates in the walls, including Porta Sant'Agostino, Porta Camiano and Porta Federico II.

#### The tour includes:

- Saint Francis Church
- Architectural lodges
- Main Square
- Consuls Palace and Palace of the Podestà
- Cathedral
- Ducal Palace
- Medieval street sand panoramic views

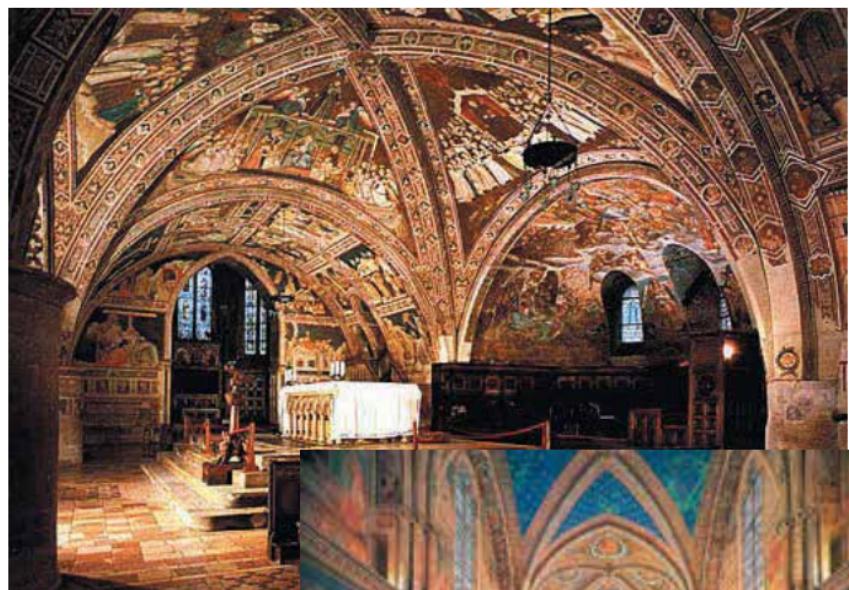
*Meeting point: Centro Congressi Quattrotorri at 9.00. Return to Perugia at about 19.00.*

*The participation fee (60.00 EUR) includes bus transfer, English speaking hostess and local guides, and served lunch.*

## **ASSISI & SPELLO**

*Thursday June 7, full day  
9.30 - 19.00*

Placed on the slope of Subasio Mountain (Monte Subasio), Assisi (<https://en.wikipedia.org/wiki/Assisi>) is without any doubt the most internationally renowned city from Umbria Region its fame mainly deriving from being the birth place of San Francis (San Francesco) the patron saint of Italy. UNESCO collectively designated the Franciscan structures of Assisi as a World Heritage Site in 2000. The city retains vestiges of the Roman age whereas the Middle Ages urban planning remains practically untouched.



The Basilica of San Francesco d'Assisi (St. Francis) is the major sight in Assisi. The Franciscan monastery, il Sacro Convento, and the lower and upper church (Italian: Basilica inferiore and Basilica superiore) of St Francis were begun in 1228, and completed in 1253. The lower church has frescoes by the late-medieval artists Cimabue and Giotto; the upper church houses frescoes of scenes in the life of St. Francis previously ascribed to Giotto, but now thought to be by artists of the circle of Pietro Cavallini from Rome.

The visit includes:

- Basilica di San Francesco (St. Francis Church)
- Piazza del Comune (Town Hall square)
- Tempio della Minerva (Minerva Temple)
- Chiesa Nuova (New Church built over the presumed parental home of St. Francis)
- Oratorio di San Francesco piccolino (Oratory of St. Francis)
- Basilica di Santa Chiara (Basilica of St. Clare)

*Lunch: Restaurant in Assisi*

Spello (in Antiquity: Hispellum) (<https://en.wikipedia.org/wiki/Spello>) is an ancient town placed on the lower southern flank of Mt. Subasio, about 6 km from Assisi. The old walled town lies on a regularly NW-SE sloping ridge that eventually meets the plain. From the top of the ridge, Spello commands a good view of the Umbrian plain towards Perugia; at the bottom of the ridge, the town spills out of its walls into a small modern section (or Borgo).



Spello remains four monumental gates and a long track of walls of Roman Age, besides the ruins of Roman amphitheatre and holy buildings. The Middle Ages town is one of the more fascinating of the Umbria Region.

The visit includes:

- Porta Urbica (Urbica Gate)
- Mura Romane (Roman Walls)
- Porta Consolare (Consular Gate)
- Chiesa Collegiata di Santa Maria Maggiore (Santa Maria Maggiore Church with Pinturicchio frescoes)
- Palazzo Comunale (Medieval Town Hall)
- Palazzo Cruciali (Cruciali Palace)
- Belvedere (panoramic viewpoint)
- Porta Venere con Torri di Propezzio (Venere Gate and Propezzio Towers)



*Meeting point: Centro Congressi Quattrotorri at 9.00. Return to Perugia at about 19.00.*

*The participation fee (60.00 EUR) includes transportation, city entrance taxes, English speaking hostess and local guides, and lunch.*

## **GUBBIO**

*Friday June 8, morning  
9.30 - 13.00*

Gubbio (<https://en.wikipedia.org/wiki/Gubbio>), located on the lowest slope of Mt. Ingino, a small mountain of the Apennines, is among the best preserved splendid Middle Ages city of Umbria Region. The city's origins are very ancient. The hills above the town were already occupied in the Bronze Age, followed by Umbrian people and Roman conquest in the 2nd century BC. Gubbio became very powerful in the beginning of the Middle Ages and became part of the Papal States in 1631. The historical centre of Gubbio has a decidedly medieval aspect: the town is austere in appearance because of the dark grey stone, narrow streets, and Gothic architecture. Many houses in central Gubbio date to the 14th and 15th centuries, and were originally the dwellings of wealthy merchants.

Among most important buildings and sites in the city are: Roman Theater and Roman Mausoleum, Palazzo dei Consoli, Duomo, Palazzo Ducale and several others.

The visit includes:

- Chiesa di San Francesco (St. Francis Church)
- Logge (Open galleries)
- Piazza Grande (Main Square)
- Palazzo dei Consoli e Palazzo del Podestà (Middle Ages public palaces)
- Cattedrale (Cathedral)
- Palazzo Ducale (Dukes Palace)
- Middle Ages alleys and panoramic views



*Meeting point: Centro Congressi Quattrotorri at 9.00. Return to Perugia at about 13.00.*

*The participation fee (30.00 EUR) includes transportation, city taxes, English speaking guide.*





Comune di  
Perugia

