

SESSIONS BY DAY

8th Forum on
New Materials



Perugia, Italy • June 10-14, 2018



CIMTEC2018

CIMTEC 2018

Flowsheet		JUNE 10		JUNE 11		JUNE 12		JUNE 13		JUNE 14	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
8 th FORUM ON NEW MATERIALS	REGISTRATION										
	SYMPOSIUM FA			FA	FA	FA	FA	FA	FA	FA	
	SYMPOSIUM FB			FB	FB	FB		FB			
	FOCUSED SESSION FB-6							FB-6		FB-6	
	SYMPOSIUM FC			FC	FC	FC	FC	FC	FC	FC	
	SYMPOSIUM FD			FD	FD	FD	FD	FD	FD	FD	
	SYMPOSIUM FE			FE	FE	FE	FE	FE	FE	FE	FE
	SYMPOSIUM FF			FF	FF	FF	FF	FF	FF	FF	FF
	SYMPOSIUM FG			FG	FG	FG	FG	FG	FG	FG	FG
	SYMPOSIUM FH			FH	FH	FH	FH	FH	FH	FH	
	SYMPOSIUM FI			FI	FI	FI	FI	FI	FI	FI	FI
	SYMPOSIUM FJ			FJ	FJ	FJ	FJ	FJ	FJ	FJ	FJ
	SYMPOSIUM FK			FK	FK	FK	FK	FK	FK	FK	FK
	FOCUSED SESSION FK-10					FK-10	FK-10	FK-10			
	SYMPOSIUM FL			FL	FL	FL	FL	FL	FL	FL	FL
	CONFERENCE FM			FM	FM	FM	FM	FM	FM	FM	FM
	CONFERENCE FN			FN	FN	FN	FN	FN	FN	FN	FN
	CONFERENCE FO			FO	FO	FO	FO	FO	FO	FO	FO
	CONFERENCE FP			FP	FP	FP	FP	FP	FP	FP	
	POSTER MOUNTING										
POSTER DISCUSSION											
SOCIALS											



WELCOME RECEPTION



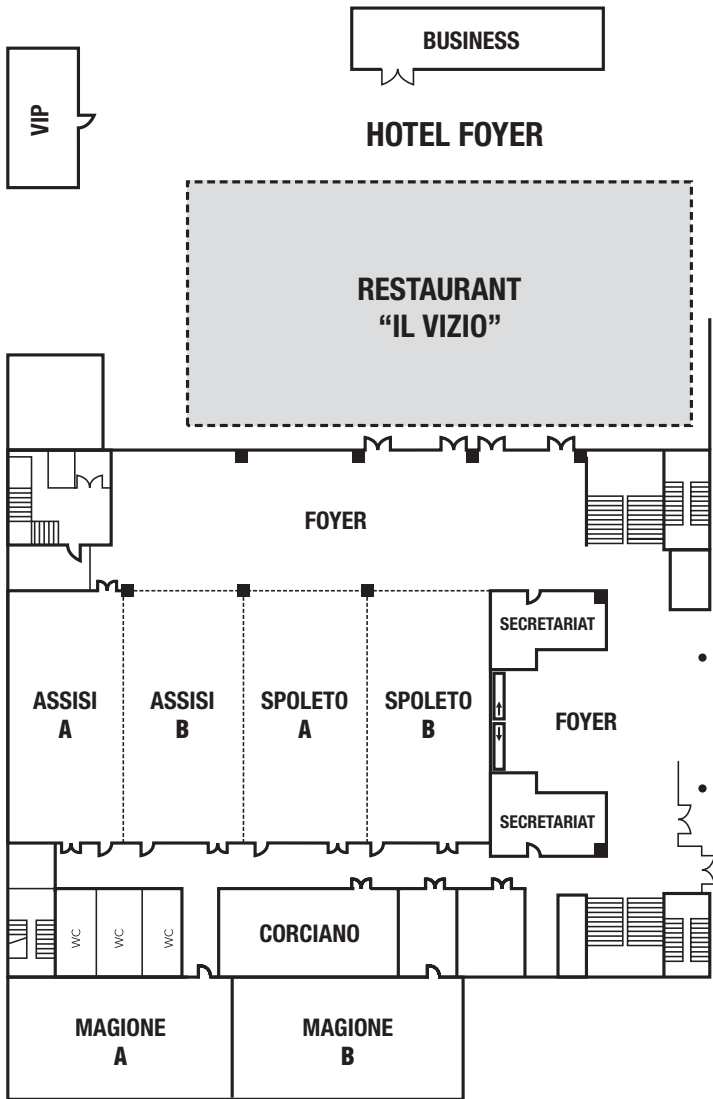
GALA CONCERT



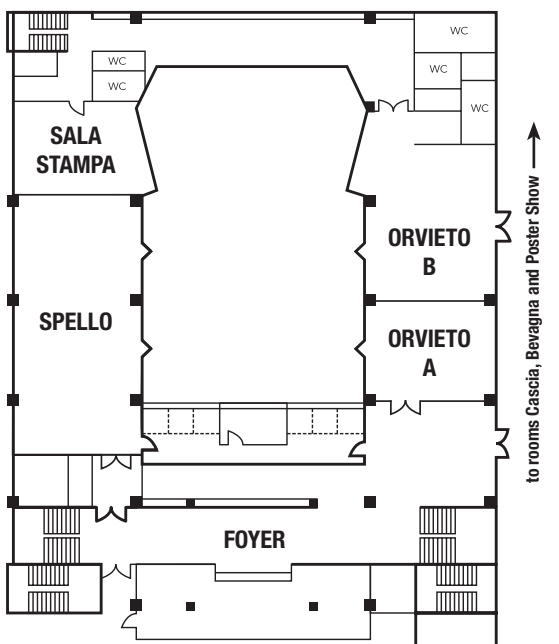
CONFERENCE DINNER

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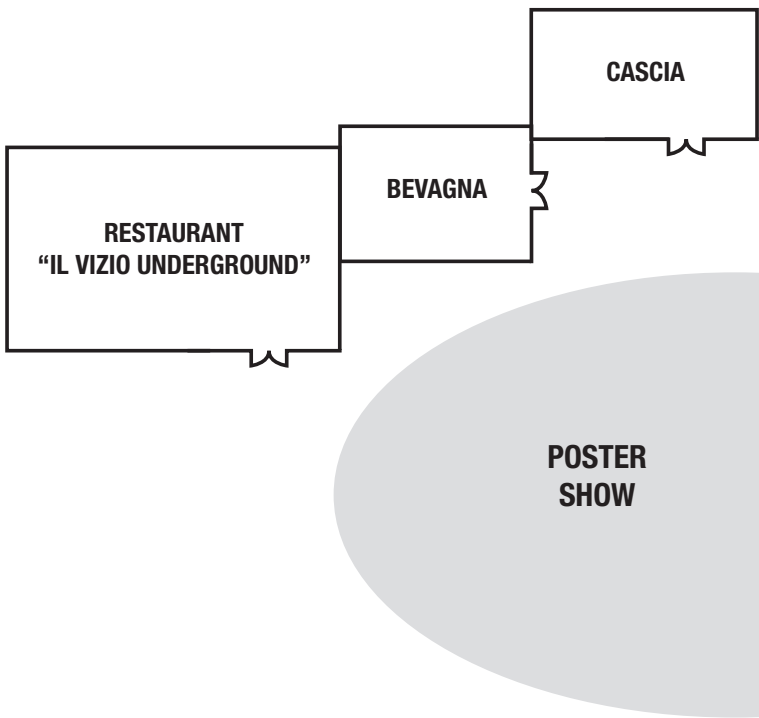
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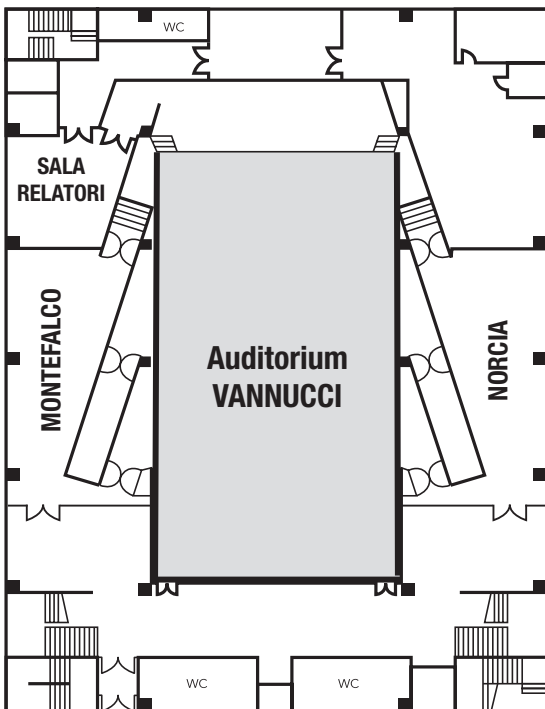
Ground Floor



Level -1



Level -1



Level -2

FORUM OUTLINE

SYMPOSIUM **FA**

Materials Issues in Flexible and Stretchable Electronics

SYMPOSIUM **FB**

Towards Next Generation Solar Cells: Emerging Materials, Phenomena and Device Architectures

Focused Session **FB-6**

Perovskite Photovoltaics

SYMPOSIUM **FC**

Hydrogen Production and Storage

SYMPOSIUM **FD**

Materials Demands Towards New Generation Electrochemical Energy Storage Systems

SYMPOSIUM **FE**

Fuel Cells: Materials and Technology Challenges

SYMPOSIUM **FF**

Progress in Materials and Devices for Direct Thermal-to-Electric Energy Conversion

SYMPOSIUM **FG**

Magnetic Materials for Energy

SYMPOSIUM **FH**

Advanced Photocatalytic Materials for Energy Transition, Solar-driven Chemistry and Environmental Applications

SYMPOSIUM **FI**

Materials and Technologies for Next Generation Solid State Lighting

SYMPOSIUM **FJ**

Development and Application of New Functional
Transparent Conducting and Semiconducting
Inorganic Materials

SYMPOSIUM **FK**

Materials Challenges for Sustainable Nuclear
Fission and Fusion Technologies

Focused Session **FK-10**

Materials Issues in Nuclear Waste Treatment and Disposal

SYMPOSIUM **FL**

Biological, Biohybrid and Bioinspired Materials:
From Electronics and Photonics to Medicine

Serial Conferences

FM

3rd International Conference

Emerging Materials, Technologies and
Applications for Non-volatile Memory Devices

FN

6th International Conference

Novel Functional Carbon Nanomaterials

FO

8th International Conference

Science and Engineering of Novel
Superconductors

FP

12th International Conference

Medical Applications of Advanced Biomaterials
and Nano-biotechnology

Meeting Rooms by Symposia

OPENING SESSION	AUDITORIUM
Symposium FA	CORCIANO
Symposium FB	ASSISI A
Focused Session FB-6	ASSISI A
Symposium FC	ASSISI B
Symposium FD	NORCIA
Symposium FE	SPELLO
Symposium FF.....	SALA RELATORI
Symposium FG	SPOLETO A
Symposium FH	SALA STAMPA
Symposium FI	BEVAGNA
Symposium FJ	CASCIA
Symposium FK	SPOLETO B
Focused Session FK-10	VIP
Symposium FL.....	MAGIONE A
Conference FM	ORVIETO A
Conference FN	ORVIETO B
Conference FO	MONTEFALCO
Conference FP	MAGIONE B

Events by Day

Sunday June 10

15.00-19.00

REGISTRATION

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

Monday June 11

Morning: 9.30-13.00

Opening Session

Welcome Addresses

Plenary Lectures (F:PL1-PL3)

8.30-13.00

POSTER MOUNTING

Monday June 11

Afternoon: 14.25-18.30

- Symposium FA (FA-1:IL01-IL04)
Symposium FB (FB-1.1:IL01-IL02)
(FB-1.2:IL02-IL04)
Symposium FC (FC-1.1:IL01-IL02)
(FC-1.3:IL01-L03)
(FC-2.7:IL01)
Symposium FD (FD-1:IL01-L03)
(FD-1:IL04-L05)
Symposium FE (FE-1:IL01-IL02)
(FE-1:IL03-IL04)
Symposium FF (FF-1:IL01-IL02)
(FF-1:IL03-IL04)
Symposium FG (FG-1:IL01-IL03)
(FG-1:IL04-IL05)
(FG-3:IL03)
Symposium FH (FH-1:IL01-IL02)
(FH-1:IL03-IL04)
Symposium FI (FI-1:IL01+IL04)
Symposium FJ (FJ-1:IL01+IL03)
(FJ-1:IL04)
Symposium FK (FK-1:IL01-IL02)
(FK-3:IL01-IL02)
Symposium FL (FL-1:IL01-IL02)
(FL-1:IL03-IL04)
Conference FM (FM-3:IL01-IL04)
(FM-3:IL05-L07)
Conference FN (FN-1:IL01-IL03)
(FN-1:IL05-IL06)
Conference FO (FO-1:IL01-IL03)
(FO-2:IL01-IL03)
Conference FP (FP-1:IL01-IL02)
(FP-1:IL03+IL05)

14.30-18.30

POSTER MOUNTING

20.30 - 22.00
Welcome Party

Tuesday June 12

Morning: 9.00-13.00

- Symposium FA (FA-1:IL05-L07)
(FA-2:IL06-IL07)
(FA-3:IL07)
- Symposium FB (FB-2:IL01-IL03)
(FB-5:IL01)
(FB-1.2:IL05-L08)
- Symposium FC (FC-1.2:IL02+IL04)
(FC-1.1:IL04-L05)
(FC-1.4:L01)
- Symposium FD (FD-1:IL06-L08)
(FD-1:IL09-IL10)
(FD-2:IL04)
- Symposium FE (FE-1:L06-L10)
(FE-1:L11-L12)
- Symposium FF (FF-1:IL05-IL06)
(FF-1:IL07)
(FF-2:IL02)
- Symposium FG (FG-1:IL07-IL09)
(FG-1:IL10-IL12)
- Symposium FH (FH-1:IL05-IL07)
(FH-2:IL01-IL02+L07)
- Symposium FI (FI-1:IL05-L07)
(FI-1:IL08-L09)
- Symposium FJ (FJ-1:IL06-IL08)
(FJ-1:IL09-IL10)
- Symposium FK (FK-1:IL04-L08)
(FK-2:IL01-L04)
(FK-10.1:IL01-L03)
(FK-10.1:IL04-L06)
- Symposium FL (FL-1:IL05-IL06)
(FL-1:L07-L08)
- Conference FM (FM-1:IL01)
(FM-3:IL08+L12)
(FM-3:IL09-L10+L16)
- Conference FN (FN-1:IL07-IL09)
(FN-1:IL12-L15)
- Conference FO (FO-1:IL04-L06)
(FO-3:IL01-IL04)
- Conference FP (FP-1:IL06-IL08)
(FP-1:L09)
(FP-2:IL02)

Tuesday June 12

Afternoon: 14.30-18.30

Symposium FA	(FA-1:IL11-L13) (FA-2:IL01-IL02)
Symposium FB	(FB-1.3:IL01-L04) (FB-3:IL01-L03)
Symposium FC	(FC-2.6:IL01-L02) (FC-2.1:IL01-IL02)
Symposium FD	(FD-1:IL14-IL15) (FD-1:IL21)
Symposium FE	(FE-1:L14) (FE-2:IL01) (FE-2:IL02)
Symposium FF	(FF-2:IL04+IL09) (FF-1:IL08+L10+IL09)
Symposium FG	(FG-2:IL02-IL04)
Symposium FH	(FH-1:IL08-L10) (FH-2:IL03-IL04)
Symposium FI	(FI-1:IL10-L13)
Symposium FJ	(FJ-2:IL01-IL02) (FJ-2:L03) (FJ-3:IL04)
Symposium FK	(FK-3:IL03-IL06) (FK-5:IL01-L03) (FK-10.2:IL01-IL04)
Symposium FL	(FL-1:IL10-IL11) (FL-2:IL01-IL02)
Conference FM	(FM-3:IL17-IL19) (FM-2:IL01-L04)
Conference FN	(FN-2:IL02-IL03) (FN-4:IL01-L04+L11)
Conference FO	(FO-2:IL04-IL05) (FO-3:L06-L08)
Conference FP	(FP-1:IL12-L16) (FP-3:IL01-IL02)

Wednesday June 13

Morning: 9.00-13.00

Symposium FA	(FA-2:IL04-IL05) (FA-1:IL08-L09)
Symposium FB	(FB-6.1:IL01-L04) (FB-6.3:IL01-L02)
Symposium FC	(FC-2.2:IL02-L05) (FC-2.3:IL01-IL03)
Symposium FD	(FD-1:IL16-L18) (FD-1:IL19-IL20)
Symposium FE	(FE-2:IL04-IL06) (FE-2:IL07-IL08)
Symposium FF	(FF-3:IL01-L04) (FF-2:IL03+IL08)
Symposium FG	(FG-2:IL05-IL07) (FG-2:IL08) (FG-3:IL02)
Symposium FH	(FH-2:IL05-L06) (FH-3:IL01-IL02)
Symposium FI	(FI-2:IL01-IL03) (FI-2:IL04-L05)
Symposium FJ	(FJ-2:IL06-IL08) (FJ-2:IL09-L11)
Symposium FK	(FK-5:IL04-L07) (FK-5:L09-L10) (FK-10.3:IL01-IL02) (FK-10.3:IL03) (FK-10.4:IL01)
Symposium FL	(FL-3:IL01-IL02) (FL-3:IL04)
Conference FM	(FM-2:IL10-L14) (FM-2:IL05-L09)
Conference FN	(FN-3:IL02-IL05) (FN-3:IL06-L09)
Conference FO	(FO-3:IL10-IL11) (FO-4:IL02-IL03) (FO-5:IL03)
Conference FP	(FP-2:IL04-L08) (FP-4:IL01-IL03)

Wednesday June 13

Afternoon: 14.30-18.30

- Symposium FA (FA-3:IL01+IL04)
(FA-3:L05-L06)
- Symposium FB (FB-3:L06)
(FB-4:IL01)
(FB-4:IL02)
(FB-5:IL02)
- Symposium FC (FC-2.2:IL06-IL07)
(FC-2.2:IL08)
(FC-2.5:IL02)
- Symposium FD (FD-2:IL01-L03)
- Symposium FE (FE-2:IL11-L12)
- Symposium FF (FF-2:IL10-L12)
(FF-3:IL05-L06)
- Symposium FG (FG-3:IL04-IL06)
(FG-3:L07-IL09)
- Symposium FH (FH-2:IL08+IL11)
- Symposium FI (FI-2:IL07-IL08)
(FI-2:IL09-L10)
- Symposium FJ (FJ-2:IL12b-IL15)
(FJ-2:IL16-L17)
- Symposium FK (FK-6:IL01-IL03)
(FK-8:IL01-IL02)
- Symposium FL (FL-3:IL06-IL07)
(FL-3:IL08-IL09)
- Conference FM (FM-2:IL15-IL19)
(FM-2:L20-L22)
(FM-3:IL14)
- Conference FN (FN-2:IL04-L08)
(FN-4:IL05-IL06)
- Conference FO (FO-4:IL06-IL07)
(FO-6:IL01)
- Conference FP (FP-3:IL03+IL05)
(FP-3:IL04)
(FP-5:IL01)

21.30-23.30
Opera Concert

Thursday June 14

Morning: 9.00-13.00

Symposium FA	(FA-3:IL08-L09) (FA-3:IL10-IL11)
Symposium FB	(FB-6.2:IL01-IL02) (FB-6.4:IL01-L02) (FB-6.5:IL01+L04)
Symposium FC	(FC-2.1:IL04-L06) (FC-2.4:IL01+IL03) (FC-2.7:L03)
Symposium FD	(FD-2:IL05) (FD-3:IL02-IL03)
Symposium FE	(FE-3:L01-L03) (FE-3:IL04-IL05)
Symposium FF	(FF-2:IL05-IL07) (FF-3:IL02+IL09)
Symposium FG	(FG-3:IL10-IL12) (FG-3:IL13-IL14)
Symposium FH	(FH-3:IL03-L05) (FH-3:IL06-IL07)
Symposium FI	(FI-3:IL01-L02) (FI-3:IL04)
Symposium FJ	(FJ-2:IL18-L21) (FJ-3:IL01-L02)
Symposium FK	(FK-6:IL05-L09) (FK-6:IL10-L14)
Symposium FL	(FL-3:IL10-IL11) (FL-4:IL01-L03)
Conference FM	(FM-2:IL23-IL25) (FM-1:IL10+L02-IL06)
Conference FN	(FN-4:IL07-IL10) (FN-4:IL12-L15)
Conference FO	(FO-5:IL01-IL02) (FO-5:L04-IL05)
Conference FP	(FP-4:IL04+L07) (FP-5:IL04+IL07)

Thursday June 14

Afternoon: 14.30-18.30

- Symposium FE (FE-3:IL06-IL07)
- Symposium FF (FF-3:IL10-IL12)
- Symposium FG (FG-4:IL01-IL04)
- Symposium FI (FI-4:IL01-IL03)
- Symposium FJ (FJ-1:IL02)
(FJ-3:IL05)
(FJ-3:IL06-IL07)
- Symposium FK (FK-7:IL02-L03)
(FK-7:IL04-IL06)
- Symposium FL (FL-4:IL06-IL08)
- Conference FM (FM-1:IL07+IL11-L12)
- Conference FN (FN-4:L16-IL19)
(FN-4:IL20-IL22)
- Conference FO (FO-7:IL01-IL04)

16.30-18.30

POSTER DISCUSSION

20.30-23.00

Conference Dinner

SESSIONS FLOWSHEET

June 10-14

8th Forum on

New Materials

Chair

Pietro Vincenzini

World Academy of Ceramics
National Research Council, Italy

Co-Chair

Robert P.H. Chang

Northwestern University, USA
International Union of Materials Research Societies

Conveners

Symposium FA: **Mario Caironi**, Italy

Symposium FB: **Santosh Shrestha**, Australia

Focused Session FB-6: **Tsutomu Miyasaka**, Japan

Symposium FC: **Andreas Züttel**, Switzerland

Symposium FD: **Arumugam Manthiram**, USA

Symposium FE: **Antonino S. Aricò**, Italy

Symposium FF: **Yuzuru Miyazaki**, Japan

Symposium FG: **Franca Albertini**, Italy

Symposium FH: **Gabriele Centi**, Italy

Symposium FI: **Michele Muccini**, Italy

Symposium FJ: **Andriy Zakutayev**, USA

Symposium FK: **Hua-Tay Lin**, China

Focused Session FK-10: **Kevin Fox**, USA

Symposium FL: **Gianluca Farinola**, Italy

Conference FM: **Sabina Spiga**, Italy

Conference FN: **Yury Gogotsi**, USA

Conference FO: **Davor Pavuna**, Switzerland

Conference FP: **Thomas Webster**, USA

OPENING SESSION

AUDITORIUM

Chair:

Morinobu ENDO, Japan

9.30 - 10.00

Welcome Addresses

Michele FIORONI

Deputy Mayor of the Municipality of Perugia

Maurizio PERUZZINI

CNR, National Research Council of Italy

Dario DELLA SALA

ENEA, Italian National Agency for New Technologies,
Energy and the Environment

Robert P.H. CHANG

International Union of Materials Research Societies

Masahiro YOSHIMURA

World Academy of Ceramics

Plenary Lectures

10.00 - 10.55

F:PL1

Integrated Quantum Materials and Devices

Robert M. WESTERVELT

Center for Integrated Quantum Materials, Harvard University,
Cambridge, MA, USA

11.00 - 11.55

F:PL2

**Ultraflexible and Stretchable Electronics for Microvolt
Biosignal Monitoring Systems**

Tsuyoshi SEKITANI

The Institute of Scientific and Industrial Research, Osaka
University, Ibaraki, Osaka, Japan

12.00 - 12.55

F:PL3

**Mesoscopic Photosystems for the Generation of
Electricity and Fuels from Sunlight**

Michael GRAETZEL

Ecole Polytechnique Fédérale de Lausanne (EPFL),
Lausanne, Switzerland

**SYMPOSIUM FA
MATERIALS ISSUES IN FLEXIBLE AND
STRETCHABLE ELECTRONICS**

Room: **CORCIANO**

Chair: Mario CAIRONI, Italy (*Convener*)

14.25 *Welcome*

Session FA-1 - Materials and Fabrication Processes

- 14.30 *FA-1:IL01* **Material Challenges for Printed Electronics in the Microwave Domain**
C. ARMIENTO, Alkim Akyurtlu University of Massachusetts, Lowell, MA, USA
- 15.10 *FA-1:IL02* **Soft and Flexible Bioelectronics**
R.A. GREEN, J.A. GODING, Imperial College London, London, UK
- 15.50 *FA-1:IL04* **Organic Bioelectronic Textiles in Health Monitoring Devices**
E. ISMAILOVA, Department of Bioelectronics, Ecole Nationale Supérieure des Mines de Saint Etienne, CMP-EMSE, MOC, Gardanne, France

SYMPOSIUM FB

**TOWARDS NEXT GENERATION SOLAR CELLS:
EMERGING MATERIALS, PHENOMENA AND
DEVICE ARCHITECTURES**

Room: **ASSISI A**

Chair: Santosh SHRESTHA, Australia (*Convener*)

14.25 *Welcome*

Session FB-1 - Thin-film Photovoltaics

14.30 *FB-1.1:IL01* **Optimal Atomic Structure of Amorphous Silicon Obtained from Density Functional Theory Calculations**
P. PEDERSEN¹, L. PIZZAGALLI², **H. JONSSON**¹, ¹Faculty of Physical Sciences and Science Institute, University of Iceland, Reykjavík, Iceland ²Dept. of Physics and Mechanics of Materials, Institut P¹, CNRS-Université de Poitiers UPR 3346, SP2MI, Futuroscope Chasseneuil Cedex, France

15.00 *FB-1.1:IL02* **Atomic Layer Deposited Nanolayers to Enhance Silicon Photovoltaics**
E. KESSELS, **B. MACCO**, Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands

15.30 *Break*

Chair: Hannes JONSSON, Iceland

16.00 *FB-1.2:IL02* **New Disruptive Design of CIGS(e) Solar Cells Based on Advanced Surface Techniques Structures and Layers used in Silicon Solar Technology**
B. VERMANG et al., University of Hasselt and Imec, Diepenbeek, Belgium

16.30 *FB-1.2:IL03* **Combination of Heat-light Soaking and Light Soaking for Performance Improvement of Cu(In,Ga)(S,Se)₂ Solar Cell**
JAKAPAN CHANTANA¹, TAKUYA KATO², HIROKI SUGIMOTO², TAKASHI MINEMOTO¹, ¹Department of Electrical and Electronic Engineering, Ritsumeikan University, Shiga, Japan; ²Atsugi Research Center, Solar Frontier K. K., Atsugi, Kanagawa, Japan

17.00 *FB-1.2:IL04* **Sprayed Non-doped and Ga-doped ZnO Films for CuInGaSe₂ Solar Cells**
KENJI YOSHINO, University of Miyazaki, Miyazaki, Japan

SYMPOSIUM FC
HYDROGEN PRODUCTION AND STORAGE

Room: **ASSISI B**

Chair: Andreas ZUETTEL, Switzerland (*Convener*)

14.25 *Welcome*

Session FC-1 - Hydrogen Production

14.30 *FC-1.1:IL01* **New Materials and Concepts for Photocatalytic and Photoelectrochemical H₂ Production**

G. MUL, KAI HAN, YUXI GUO, K. WENDERICH, A. BELTRAM*, I. SIRETANU*, B. MEI, F. MUGELE, University of Twente, Faculty of Science and Technology PCS & PCF* groups, Enschede, The Netherlands

15.00 *FC-1.1:IL02* **Solution-processed Photocathode for Direct Solar Water Reduction**

K. SIVULA, Institute of Chemical Sciences and Engineering Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

15.30 *Break*

Chair: Kevin SIVULA, Switzerland

16.00 *FC-1.3:IL01* **Catalytic Power-to-Gas Technologies for Storing Hydrogen with Biomass**

O. KROECHER, F. VOGEL, T. SCHILDHAUER, Paul Scherrer Institute, Villigen PSI, Switzerland

16.30 *FC-1.3:IL02* **Hydrogen Production from Biobased Compounds on Smart Ni Based Catalysts**

L. JALOWIECKI-DUHAMEL, Univ. Lille, CNRS, Centrale Lille, ENSC, Univ. Artois, UMR 8181-UCCS-Unité de Catalyse et Chimie du Solide, Lille, France

17.00 *FC-1.3:L03* **Mixed electronic- and Protonic-conducting Composites for Hydrogen Separation Ceramic Membranes**

Y.N. BESPALKO, V.A. SADYKOV, P.I. SKRYABIN, A.V. KRASNOV, E.M. SADOVSKAYA, N.F. EREMEEV, Boreskov Institute of Catalysis, Novosibirsk, Russia; N.F. UVAROV, A.S. ULIHIN, Institute of Solid State Chemistry and Mechanochemistry, Novosibirsk, Russia

Session FC-2 - Hydrogen Storage

17.20 *FC-2.7:IL01* **Scaled-up Materials Synthesis and Testing of Hydrogen Storage Tanks based on Nanostructured Hydrides**

M. DORNHEIM, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany

SYMPOSIUM FD
**MATERIALS DEMANDS TOWARDS NEW
GENERATION ELECTROCHEMICAL ENERGY
STORAGE SYSTEMS**

Room: **NORCIA**

Chair: Arumugam MANTHIRAM, USA (*Convener*)

14.25 *Welcome*

Session FD-1 - Batteries

14.30 *FD-1:IL01* **Advances in Na-ion Batteries**

T. ROJO, Department of Inorganic Chemistry, Faculty of Science and Technology, University of the Basque Country (UPV/EHU), Bilbao, Spain; and CIC energiGUNE, Parque Tecnológico de Álava, Miñano, Spain

15.10 *FD-1:IL02* **Materials for Advanced Lithium and Lithium-ion Batteries for NASA's Future Missions**

R. BUGGA, M. SMART, W. WEST, E. BRANDON, R. EWELL, R. SURAMPUDI, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

15.50 *FD-1:L03* **MgH₂-TiH₂ Nanocomposites as a Conversion Material for Conventional or Solid State Li-ion Battery Anodes**

F. CUEVAS, J. ZHANG, M. LATROCHE, Université Paris Est, ICMPE, CNRS-UPEC, Thiais, France

16.20 *Break*

Chair: Giuseppe A. ELIA, Germany

16.50 *FD-1:IL04* **Complex Hydrides as Electrolytes for Lithium-ion Batteries**

D. GREGORY, WestCHEM, School of Chemistry, University of Glasgow, Glasgow, UK

17.30 *FD-1:L05* **Li Insertion into Li₄Ti₅O₁₂ Spinel Prepared by Low Temperature Solid State Route: Charge Capability vs Surface Area**

M. ZUKALOVA, L. KAVAN, J. Heyrovsky Institute of Physical Chemistry, CAS, Prague, Czech Republic; M. FABIAN, Institute of Geotechnics, SAS, Košice, Slovak Republic; M. KLEMENTOVA, Institute of Physics of CAS, Prague, Czech Republic; M. SENNA, Faculty of Science and Technology, Keio University, Yokohama, Japan

**SYMPOSIUM FE
FUEL CELLS: MATERIALS AND
TECHNOLOGY CHALLENGES**

Room: **SPELLO**

Chair: Antonino S. ARICÒ, Italy (*Convener*)

14.25 *Welcome*

Session FE-1 - Solid Oxide Fuel Cells (SOFCs)

14.30 *FE-1:IL01* **Development and In-situ Characterization of Fast Ion Conductors for SOFCs**

S. SKINNER, Imperial College London, London, UK

15.10 *FE-1:IL02* **Architecturally Designed La_{2-x}Pr_xNiO_{4+δ} Cathodes for SOFCs**

E. DJURADO, N.I. KHAMIDY, R.K. SHARMA, Institute of Engineering Univ. Grenoble Alpes, LEPMI, Grenoble, France

15.50 *Break*

Chair: Stephen SKINNER, UK

16.20 *FE-1:IL03* **Perovskite Electrodes for SOFCs Powered by Biogas**

E. DI BARTOLOMEO, University of Rome Tor Vergata, Department of Chemical Science and Technologies, Rome, Italy

17.00 *FE-1:IL04* **Metal Supported Fuel Cells: Improved Electrochemical Performance by Improved Processing**

M. BRAM^{1,2}, F. THALER^{1,2}, D.UDOMSILP^{1,2}, C. BISCHOF¹, A.K. OPITZ^{1,3}, ¹Christian Doppler Laboratory for Interfaces in Electrochemical Energy Converters; ²Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research - Materials Synthesis and Processing (IEK-1), Jülich, Germany; ³Vienna University of Technology, Institute of Chemical Technologies and Analytics, Vienna, Austria

SYMPOSIUM FF
**PROGRESS IN MATERIALS AND DEVICES FOR
DIRECT THERMAL-TO-ELECTRIC ENERGY
CONVERSION**

Room: **SALA RELATORI**

Chair: Yuzuru MIYAZAKI, Japan (*Convener*)

14.25 *Welcome*

**Session FF-1 - Theoretical Concepts and Basic
Approaches for High Efficiency Thermal-
to-electrical Energy Conversion**

14.30 *FF-1:IL01* **Thermoelectrics in Strongly Correlated Electron
Systems**
ICHIRO TERASAKI, Department of Physics, Nagoya University,
Nagoya, Japan

15.10 *FF-1:IL02* **Electronic Structure Calculations of Energy
Converting Alloys by KKR-CPA Method**
J. TOBOLA, S. KAPRZYK, M. RYBSKI, B. WIENDLOCHA, AGH
University of Science and Technology, Faculty of Physics and Applied
Computer Science, Krakow, Poland

15.50 *Break*

Chair: Ichiro TERASAKI, Japan

16.20 *FF-1:IL03* **Optimization of Nanostructured Thermoelectrics
through Computer Simulations**
K. TERMENTZIDIS, CETHIL UMR 5008, CNRS, INSA of Lyon,
Villeurbanne, France

17.00 *FF-1:IL04* **High Throughput DFT Calculations - Screening for
New TE Compounds**
G.K.H. MADSEN, Institut für Materialchemie, TU Wien, Vienna,
Austria

**SYMPOSIUM FG
MAGNETIC MATERIALS FOR ENERGY**

Room: **SPOLETO A**

Chair: Franca ALBERTINI, Italy (*Convener*)

14.25 *Welcome*

Session FG-1 - Hard Magnetic Materials

- 14.30 *FG-1:IL01* **New Research Strategies in RE-based Magnets**
A.M. GABAY, **G.C. HADJIPANAYIS**, University of Delaware, Newark, DE, USA
- 15.00 *FG-1:IL02* **High-performance Permanent Magnets without Rare Earths: Challenges and Perspectives**
K.P. SKOKOV, O. GUTFLEISCH, Technische Universität Darmstadt, Institut für Materialwissenschaft, Darmstadt, Germany
- 15.30 *FG-1:IL03* **Multidriver Processing Routes to Chemical Order in FeNi**
L.H. LEWIS, Northeastern University, Boston, MA, USA

16.00 *Break*

Chair: Laura H. LEWIS, USA

- 16.30 *FG-1:IL04* **Heusler Compounds: Towards Rare-Earth-Free Permanent Magnets**
C. FELSER, **A. MARKOU**, Max Planck Institute for Chemical Physics of Solids, Dresden, Germany
- 17.00 *FG-1:IL05* **Intrinsic Magnetic Properties of RFe₁₂ Based Hard Magnetic Phase**
YUSUKE HIRAYAMA, Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology, Nagoya, Japan

Session FG-3 - Magnetocaloric and Multifunctional Magnetic Materials

- 17.30 *FG-3:IL03* **Tuning Magnetocaloric Materials with Stress**
X. MOYA, Department of Materials Science, University of Cambridge, Cambridge, UK

SYMPOSIUM FH
ADVANCED PHOTOCATALYTIC MATERIALS
FOR ENERGY TRANSITION, SOLAR-DRIVEN
CHEMISTRY AND ENVIRONMENTAL
APPLICATIONS

Room: **SALA STAMPA**

Chair: Gabriele CENTI, Italy (*Convener*)

14.25 *Welcome*

Session FH-1 - Design Elements and Advanced Concepts for Photofunctional Materials

14.30 *FH-1:IL01* **Electrochemical Oxygen & Chlorine Production: Enhancing Electro-catalytic Activity Using Atomic Layer Deposition**

M.R. HOFFMANN, Division of Engineering & Applied Science, California Institute of Technology, Pasadena, CA, USA

15.10 *FH-1:IL02* **Ultra-efficient Solar CO₂ Conversion using Oxide Semiconductor Electrodes**

UNSEOCK KANG^{1,2}, SEUNG YO CHOI^{1,2}, HYE WON JEONG^{1,2}, GUANGXIA PIAO^{1,2}, DONG SUK HAN³, **HYUNWOONG PARK**^{1,2},
¹School of Energy Engineering, Kyungpook National University, Daegu, South Korea; ²School of Architectural, Civil, Environmental, and Energy Engineering, Kyungpook National University, Daegu, South Korea; ³Chemical Engineering Program, Texas A&M University at Qatar, Education City, Doha, Qatar

15.50 *Break*

Chair: Michael R. HOFFMANN, USA

16.20 *FH-1:IL03* **Nanocomposite Materials as Photoelectrodes in Solar Fuel Generation: Opportunities and Challenges**

C. JANAKY, E. KECSENOVITY, B. ENDRODI, University of Szeged, Szeged, Hungary

17.00 *FH-1:IL04* **Role of Electron Traps in Photocatalysis: Identification and Characterization of Metal Oxide Particulate Photocatalysts**

BUNSHO OHTANI, Institute for Catalysis, Hokkaido University, Sapporo, Japan

SYMPOSIUM FI
MATERIALS AND TECHNOLOGIES FOR NEXT
GENERATION SOLID STATE LIGHTING

Room: **BEVAGNA**

Chair: Michele MUCCINI, Italy (*Convener*)

14.55 *Welcome*

Session FI-1 - Material Design and Processing

15.00 *FI-1:IL01* **Intramolecular or Intermolecular Charge Transfer Approaches for Highly Efficient TADF Materials and OLEDs**
KEN-TSUNG WONG, Department of Chemistry, National Taiwan University, Taipei, Taiwan

15.40 *FI-1:IL04* **Design of Efficient TADF Materials for OLEDs**
TAKUMA YASUDA, Kyushu University, Fukuoka, Japan

SYMPOSIUM FJ
**DEVELOPMENT AND APPLICATION OF NEW
FUNCTIONAL TRANSPARENT CONDUCTING
AND SEMICONDUCTING INORGANIC
MATERIALS**

Room: **CASCIA**

Chair: Andriy ZAKUTAYEV, USA (*Convener*)

14.25 *Welcome*

Session FJ-1 - Fundamentals

14.30 *FJ-1:IL01* **Interfaces and Defects in Semiconducting Oxides**
A. KLEIN, Technische Universität Darmstadt, Institute of Materials
Science, Darmstadt, Germany

15.10 *FJ-1:IL03* **A Non-oxide p-type Transparent Semiconductor Cul**
NAOOMI YAMADA, Department of Applied Chemistry, Chubu
University, Kasugai, Japan

15.50 *Break*

16.20 *FJ-1:IL04* **Atomic Layer Deposition of Transparent Conducting
and Charge Transport Layers for Photovoltaic Applications**
M. McCARTHY, L. RYAN, S. O'BRIEN, **I.M. POVEY**, Tyndall National
Institute, University College Cork, Cork, Ireland

SYMPOSIUM FK
MATERIALS CHALLENGES FOR SUSTAINABLE
NUCLEAR FISSION AND FUSION
TECHNOLOGIES

Room: **SPOLETO B**

Chair: Hua-Tay LIN, China (*Convener*)

14.25 *Welcome*

Session FK-1 - Structural Components for Nuclear Fission and Fusion Applications

14.30 *FK-1:IL01* **Novel Materials and Advanced Design Concepts for DEMO Divertor Targets**

JEONG-HA YOU, B. BÖSWIRTH, H. GREUNER, M. LI, A.V. MÜLLER, Max Planck Institute for Plasma Physics, Garching, Germany; E. VISCA, F. CRESCENZI, S. ROCCELLA, ENEA, Dept. Fusion & Technology for Nuclear Safety, Frascati, Italy; CH. VORPAHL, EUROfusion, PMU PPPT, Garching, Germany; T. BARRETT, CCFE, Culham Science Centre, Abingdon, UK; F. GALLAY, M. RICHOU, CEA, IRFM, Saint Paul Lez Durance, France; J. REISER, KIT, IAM, Eggenstein-Leopoldshafen, Germany

15.00 *FK-1:IL02* **High-temperature Fracture Behaviour of High Chromium Ferritic-martensitic and Nanostructured Ferritic Alloys**

THAK SANG BYUN, JUNG PYUNG CHOI, Pacific Northwest National Laboratory, Richland, WA, USA; D.T. HOELZER, Oak Ridge National Laboratory, Oak Ridge, TN, USA; S.A. MALOY, Los Alamos National Laboratory, Los Alamos, NM, USA

15.30 *Break*

Chair: Sebastijan BREZINSEK, Germany

Session FK-3 - Materials for First Wall Components of Nuclear Fusion Systems

16.00 *FK-3:IL01* **Tungsten Materials for Plasma Facing Components - Status and Research Directions**

CH HENAGER Jr., RJ KURTZ, BN NGUYEN, PNNL, Richland, WA, USA; GR ODETTE, UCSB, Santa Barbara, CA, USA

16.30 *FK-3:IL02* **Advanced Tungsten Materials for Plasma-facing Components of Future Fusion Devices**

R. NEU, A. FEICHTMAYER, H. GIETL, Max-Planck-Institut für Plasmaphysik, Garching, Germany, and Technische Universität München, Garching, Germany; J. RIESCH, M. BALDEN, S. ELGETI, T. HOESCHEN, M. LI, S. OLBRICH, Max-Planck-Institut für Plasmaphysik, Garching, Germany; J. ALMANSTÖTTER, OSRAM GmbH, SP PRE PLM DMET, Schwabmünchen, Germany; J.W. COENEN, Y. MAO, L. RAUMANN, Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung - Plasmaphysik, Partner of the Trilateral Euregio Cluster (TEC), Jülich, Germany

SYMPOSIUM FL
**BIOLOGICAL, BIOHYBRID AND BIOINSPIRED
MATERIALS: FROM ELECTRONICS AND
PHOTONICS TO MEDICINE**

Room: **MAGIONE A**

Chair: Gianluca FARINOLA, Italy (*Convener*)

14.25 *Welcome*

**Session FL-1 - Classes of Materials and their Synthesis
and Chemical Modification**

14.30 *FL-1:IL01* **Biopolymer based Electrodes for Wooden Batteries
and Super Capacitors**

O. INGANAS, Biomolecular and organic electronics, Dept. Physics,
Chemistry and Biology, Linköpings Universitet, Linköping, Sweden

15.30 *FL-1:IL02* **Biosilica from Diatoms: Smart Materials from
Biomedicine to Photonics**

R. RAGNI, Dipartimento di Chimica, Università degli Studi di Bari
"Aldo Moro", Bari, Italy

16.10 *Break*

Chair: Olle INGANAS, Sweden

16.40 *FL-1:IL03* **Mussel and Plant Polyphenol Inspired Materials:
From Molecular Phenomena to Applications**

P.B. MESSERSMITH, University of California, Berkeley, CA, USA

17.20 *FL-1:IL04* **Molecular Bases of Cadherin-mediated Cell-cell
Adhesion**

E. PARISINI, Center for Nano Science and Technology @Polimi,
Istituto Italiano di Tecnologia, Milano, Italy

FM - 3rd International Conference

**EMERGING MATERIALS, TECHNOLOGIES AND
APPLICATIONS FOR NON-VOLATILE MEMORY
DEVICES**

Room: **ORVIETO A**

Chair: Sabina SPIGA, Italy (*Convener*)

14.25 *Welcome*

**Session FM-3 - Emerging Applications for Non-volatile
Memories**

14.30 *FM-3:IL01* **Learning in Spiking Neural Networks using Phase Change Memory Synapses**
B. RAJENDRAN, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ, USA

15.00 *FM-3:IL15* **Interfacing Organic Memristors with Neurons in a Bio-hybrid Network**
S. IANNOTTA, S. BATTISTONI, V. EROKHIN, CNR-IMEM, Parma, Italy

15.30 *FM-3:IL03* **RRAM Based New Computing Paradigms**
JINFENG KANG, P. HUANG, R.Z. HAN, C. LIU, Y.N. JIANG, Z. ZHOU, Y.C. XIANG, L.F. LIU, X.Y. LIU, Peking University, Beijing, China

16.00 *FM-3:IL04* **Diffusive Memristor as a Building Block for a Novel True Random Number Generator**
QIANGFEI XIA, HAO JIANG, University of Massachusetts Amherst, MA, USA

16.30 *Break*

Chair: Jinfeng KANG, China

17.00 *FM-3:IL05* **Design and CMOS Co-integration of ReRAM Devices and Crossbar Arrays for Neuromorphic Applications**
Y. LEBLEBICI, EPFL, Switzerland

17.30 *FM-3:L06* **Specific Switching Algorithms for Emerging Applications of RRAM based Memories**
E. PEREZ, M.K. MAHADEVAIAH, **Ch. WENGER**, IHP, Frankfurt (Oder), Germany; C. ZAMBELLI, P. OLIVO, Università degli Studi di Ferrara, Ferrara, Italy; F.M. PUGLISI, P. PAVAN, Università di Modena e Reggio Emilia, Modena, Italy; M. ZIEGLER, H. KOHLSTEDT, Kiel University, Kiel, Germany

17.50 *FM-3:L07* **Evolution of a-IGZO Thin-film Transistor Memory: From Incapability of Electrical Erase to Achievement of Multi-level Cell**
SHI-JIN DING, School of Microelectronics, Fudan University, Shanghai, China

**FN - 6th International Conference
NOVEL FUNCTIONAL CARBON
NANOMATERIALS**

Room: **ORVIETO B**

Chair: Yury GOGOTSI, USA (*Convener*)

14.25 *Welcome*

Session FN-1 - Growth and Processing

14.30 *FN-1:IL01* **Light Scattering and Emission from Hetero-structures**

A.C. FERRARI, Cambridge Graphene Centre, University of Cambridge, Cambridge, UK

15.00 *FN-1:IL02* **Highly Efficient Solar-fuel Photocatalysts for CO₂ Reduction to Selective Hydrocarbons**

KUEI-HSIEN CHEN^{1,2}, INDRAJIT SHOWN¹, LI-CHYONG CHEN²,
¹Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan; ²Centre for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan

15.30 *FN-1:IL03* **Preparation and Applications of Hybrid Graphene Hydrogels**

E. VAZQUEZ, Instituto Regional de Investigación Científica Aplicada (IRICA), Universidad de Castilla-La Mancha, Ciudad Real, Spain

16.00 *Break*

Chair: Morinobu ENDO, Japan

16.30 *FN-1:IL05* **Soft Processing (= Green Processing) for Nano Carbons: Direct Fabrication of Functionalized Graphenes and Their Hybrids Inks via Submerged Liquid Plasma [SLP] and Electrochemical Exfoliation [ECE] under Ambient Conditions**

MASAHIRO YOSHIMURA, J. SENTHILNATHAN, K. SANJEEVARAO, E. SATHEESHKUMAR, Promotion Centre for Global Materials Research (PCGMR), Dept. of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan

17.00 *FN-1:IL06* **Graphene Exfoliation and Processing**

A. CIESIELSKI, Institut de Science et d'Ingenierie Supramoléculaires (ISIS), Université de Strasbourg and CNRS, Strasbourg, France

MONDAY JUNE 11 AFTERNOON

FO - 8th International Conference SCIENCE AND ENGINEERING OF NOVEL SUPERCONDUCTORS

Room: **MONTEFALCO**

Chair: Davor PAVUNA, Switzerland (*Convener*)

14.25 *Welcome*

Session FO-1 - Materials, Structure, Physical Chemistry and General Properties

- 14.30 *FO-1:IL01* **Why is T_c in Cuprates so high?**
I. BOZOVIC, Brookhaven National Laboratory, Upton, NY, USA; and
Yale University, New Haven, CT, USA
- 15.00 *FO-1:IL02* **A Tale of Two Metals: Contrasting Criticalities in the
Pnictides and Hole-doped Cuprates**
N.E. HUSSEY, J. BUHOT, S. LICCIARDELLO, High Field Magnet
Laboratory (HFML-EMFL), Radboud University, Nijmegen,
Netherlands
- 15.30 *FO-1:IL03* **High T_c Pairing in Size-selected Metal Nanoclusters**
V. KRESIN, P. EDWARDS, University of Southern California, Los
Angeles, CA, USA; A. HALDER, Argonne National Laboratory, USA

16.00 *Break*

Session FO-2 - New Superconductors of the Pnictides and Related Families

Chair: Vitaly KRESIN, USA

- 16.30 *FO-2:IL01* **Magnet Application of Iron-based Superconductors**
AKIYASU YAMAMOTO, Department of Applied Physics, Tokyo
University of Agriculture and Technology, Tokyo, Japan; J. WEISS,
Department of Physics, University of Colorado, Boulder, CO, USA;
M. AINSLIE, Department of Engineering, University of Cambridge,
UK; A. POLYANSKII, D. LARBALESTIER, E. HELLSTROM, Applied
Superconductivity Center, National High Magnetic Field Laboratory,
Florida State University, USA
- 17.00 *FO-2:IL02* **Laser ARPES Study on High Temperature
Superconductors**
XINGJIANG ZHOU, National Lab for Superconductivity, Institute of
Physics, Chinese Academy of Sciences, Beijing, China
- 17.30 *FO-2:IL03* **Novel Effects in Multilayer Superconductor/Magnet
Films**
C. BERNHARD, University of Fribourg, Department of Physics and
Fribourg Center of Nanomaterials (FriMat), Fribourg, Switzerland

FP - 12th International Conference
**MEDICAL APPLICATIONS OF ADVANCED
BIOMATERIALS AND NANO-BIOTECHNOLOGY**

Room: **MAGIONE B**

Chair: Thomas WEBSTER, USA (*Convener*)

14.25 *Welcome*

Session FP-1 - Advances in Biomaterials

14.30 *FP-1:IL01* **Advanced Bioactive Structures for Intervertebral Disc Repair/Regeneration**

L. AMBROSIO, **A. GLORIA**, Institute of Polymers, Composites and Biomaterials, National Research Council, Naples, Italy

15.00 *FP-1:IL02* **Shape Memory Activated Polyelectrolyte Nanowrinkles Improve Fibroblast Cell Attachment and Alignment**

P.T. MATHER, Chemical Engineering, Bucknell University, Lewisburg, PA, USA; A. ASH-SHAKOOR, J.H. HENDERSON, Biomedical and Chemical Engineering, Syracuse University, USA

15.30 *Break*

Chair: Patrick T. MATHER, USA

16.00 *FP-1:IL03* **Development of a Fish Gelatin-based Soft Tissue Adhesive for Biomedical Applications**

TETSUSHI TAGUCHI, RYO MIZUTA, Biomaterials Field, Research Center for Functional Materials, National Institute for Materials Science, Japan

16.30 *FP-1:IL05* **Cellular and Tissue Modulation via Exploiting Molecularly Movable Polyrotaxane Surfaces**

NOBUHIKO YUI, J.-H. SEO, A. TAMURA, Y. ARISAKA, Tokyo Medical and Dental University, Tokyo, Japan; T. YAMAOKA, S. KAKINOKI, National Cerebral and Cardiovascular Center Research Institute, Osaka, Japan

TUESDAY JUNE 12 MORNING

Room: **CORCIANO**

Session FA-1 - Materials and Fabrication Processes

Chair: Craig ARMIENTO, USA

- 9.00 *FA-1:IL05* **Polymeric Solid-state Ionic Gate Dielectrics for Low-voltage Field-effect Transistors**
YONG-YOUNG NOH, Department of Energy and Materials Engineering, Dongguk University, Seoul, South Korea; **YOONSEUK CHOI**, Department of Electronics, Hanbat National University, Daejeon, South Korea
- 9.40 *FA-1:L06* **Self-organization of pi-extended Heteroacenes for Solution-processable Organic Field-effect Transistors**
TATSUYA MORI, T. YASUDA, Kyushu University, Fukuoka, Japan
- 10.10 *FA-1:L07* **Realizing Flexible High-performance Silver Interconnects on Thin and Ultrathin Substrates by Inkjet-printing and Innovative Laser Treatment**
M. VINNICHENKO¹, D. MAKAROV², M. FRITSCH¹, T. VOITSEKHIVSKA², V. SAUCHUK¹, M. KUSNEZOFF¹, ¹Fraunhofer IKTS, Dresden, Germany; ²Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany
- 10.40 *Break*

Chair: Vid BOBNAR, Slovenia

Session FA-2 - Device Physics, Mechanics and Design

- 11.10 *FA-2:IL06* **Electronic and Thermoelectric Properties of High-performance Polymer Semiconductors and Conductors**
M. KEMERINK, Complex Materials and Devices, Department of Physics, Chemistry and Biology (IFM), Linköping University, Sweden
- 11.50 *FA-2:IL07* **Organic Semiconducting Crystals as Flexible, Ultra-low Voltage, Ionizing Radiation Detectors**
B. FRABONI, Department of Physics and Astronomy, University of Bologna, Bologna, Italy

Session FA-3 - Applications of Flexible/Stretchable Electronics

- 12.30 *FA-3:IL07* **System Design for Flexible All-organic Reflectance Oximeter**
Y. KHAN, DONGGEON HAN, A. PIERRE, J. TING, XINGCHUN WANG, C.M. LOCHNER, **A.C. ARIAS**, Dept. of Electrical Engineering and Computer Sciences, University of California, Berkeley, CA, USA

TUESDAY JUNE 12 MORNING

Room: **ASSISI A**

Chair: Magnus T. BORGSTROM, Sweden

Session FB-2 - III-V Solar Cells

- 9.00 *FB-2:IL01* **High Efficiency Multi-junction Solar Cells for Concentrator Photovoltaics**
G. TIMÒ, N. ARMANI, G. ABAGNALE, RSE, Piacenza, Italy
- 9.30 *FB-2:IL02* **III-V Compound Semiconductor Nano-epitaxial Structures for High-efficiency Multi-junction Solar Cells**
MASAKAZU SUGIYAMA, Research Center for Advanced Science and Technology (RCAST), The University of Tokyo, Japan
- 10.00 *FB-2:IL03* **Efficient Solar Cells and Water Reduction with Nanowires**
D. VAN DAM, YINGCHAO CUI, A. STANDING, S. ASSALI, LU GAO, M.A. VERHEIJEN, P.H.L. NOTTEN, J.E.M. HAVERKORT, E. HENSEN, **E.P.A.M. BAKKERS**, Eindhoven University of Technology, Eindhoven, The Netherlands

Session FB-5 - Excited State Enhanced Solar Cells

- 10.30 *FB-5:IL01* **Photothermoelectric Energy Harvesting and Light Detection in Heterostructure Nanowires**
H. LINKE, NanoLund, Lund University, Lund, Sweden

11.00 *Break*

Session FB-1 - Thin-film Photovoltaics

Chair: Bart VERMANG, Belgium

- 11.20 *FB-1.2:IL05* **Interfaces in CdTe Thin-film Solar Cells**
B.G. MENDIS, A.A. TAYLOR, Durham University, Durham, UK; J.D. MAJOR, K. DUROSE, University of Liverpool, UK
- 11.50 *FB-1.2:IL06* **Low-cost Thin Film Solar Cells for BIPV Applications**
E. GILIOLI, IMEM-CNR, Parma, Italy
- 12.20 *FB-1.2:IL07* **Electronic and Chemical Structure of Interfaces in CIGS and CdTe Thin-film Solar Cells**
C. HESKE, Institute for Photon Science and Synchrotron Radiation (IPS) and Institute for Chemical Technology and Polymer Chemistry (ITCP), Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany; Dept. of Chemistry and Biochemistry, University of Nevada, Las Vegas (UNLV), Las Vegas, NV, USA
- 12.50 *FB-1.2:L08* **Optimization of Pulsed Laser Deposition Parameters for the Growth of High-quality $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$ Thin Films**
CH. NICOLAOU¹, A. ZACHARIA², G. ITSKOS², J. GIAPINTZAKIS¹,
¹Dept. of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus; ²Experimental Condensed Matter Physics Lab, Department of Physics, University of Cyprus, Nicosia, Cyprus

Room: **ASSISI B**

Session FC-1 - Hydrogen Production

Chair: Ronald MICHALSKY, Switzerland

- 9.30 *FC-1.2:IL02* **Hybrid Materials for Photobiological Hydrogen Production**
A. ANTONUCCI, N. SCHUERGERS, **A.A. BOGHOSSIAN**, Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland
- 10.00 *FC-1.2:IL04* **Water Oxidation Catalysts and a Turned Hydrogenase for Solar Hydrogen Production**
S. STYRING, Molecular Biomimetics, Department of Chemistry, Ångström, Uppsala University, Uppsala, Sweden
- 10.30 *Break*

Chair: Guido MUL, Netherlands

- 11.00 *FC-1.1:IL04* **Solar Redox Cycles for Splitting H₂O and CO₂: Status & Perspectives**
R. MICHALSKY, A. STEINFELD, ETH Zürich, Department of Mechanical and Process Engineering, Zürich, Switzerland
- 11.30 *FC-1.1:L05* **3D-printed Porous Ceria Structures for Solar Thermo-chemical Redox Splitting of H₂O and CO₂**
S. ACKERMANN, **M. HOES**, D. THEILER, P. FURLER, A. STEINFELD, ETH Zurich, Department of Mechanical and Process Engineering, Zurich, Switzerland
- 11.50 *FC-1.4:L01* **Methane Enriched Gas Produced via Co-electrolysis of H₂O and CO₂ with a Solid Oxide Cell Operating at Intermediate Temperatures**
M. LO FARO, S. TROCINO, S.C. ZIGNANI, A.S. ARICO', Institute of Advanced Energy Technologies (ITAE) of the Italian National Research Council (CNR), Messina, Italy

Room: **NORCIA**

Session FD-1 - Batteries

Chair: Teofilo ROJO, Spain

- 9.00 *FD-1:IL06* **Aluminum Batteries: Sustainable Alternative to Lithium-ion Systems**
G.A. ELIA, Technische Universität Berlin, Research Center of Microperipheric Technologies, Berlin, Germany
- 9.40 *FD-1:L07* **High-nickel Layered Oxide Cathodes for Next-generation Lithium-ion Batteries**
A. MANTHIRAM, Materials Science and Engineering Program and Texas Materials Institute, The University of Texas at Austin, Austin, TX, USA
- 10.10 *FD-1:L08* **High-temperature Reactivity of Li₇La₃Zr₂O₁₂-based Garnets with Cathode Active Materials**
V. TARNOPOLSKIY, O. HAJNDL, S. CHOMETTE, P. AZAIS, Commissariat à l'Energie Atomique et aux Energies Alternatives, Grenoble, France; M. CHAKIR, Renault, France
- 10.40 *Break*

Chair: Fermin CUEVAS, France

- 11.00 *FD-1:IL09* **Electrochemical Properties of Highly Concentrated Aqueous Na-ion Battery**
SHIGETO OKADA, RYO SAKAMOTO, KOSUKE NAKAMOTO, AYUKO KITAJOU, DAIKI MURAKAMI, HARUKA HIRAI, MASARU TANAKA, Institute for Materials Chemistry and Engineering, Kyushu University, Kasuga, Fukuoka, Japan
- 11.40 *FD-1:IL10* **Layered Oxide Electrode Materials for Sodium-ion Batteries**
C. DELMAS, J. YOSHIDA, B. MORTERMARD, L. VITOUX, M. GUIGNARD, D. CARLIER, ICMCB, Pessac France; J. YOSHIDA, Toyota Motor Europe NV/SA, Zaventem, Belgium

Session FD-2 - Supercapacitors

- 12.20 *FD-2:IL04* **Buffered Solutions as New Electrolytes for Aqueous Supercapacitors**
WATARU SUGIMOTO, SHO MAKINO, DAI MOCHIZUKI, Shinshu University, Faculty of Textile Science and Technology, Ueda, Japan

Room: **SPELLO**

Session FE-1 - Solid Oxide Fuel Cells (SOFCs)

Chair: Elisabeth DJURADO, France

- 9.00 *FE-1:L06* **Analysis of Microstructural Change of Electrodes during Discharge Operation of Solid Oxide Fuel Cells**
KOICHI EGUCHI, HIROKI MUROYAMA, TOSHIAKI MATSUI,
Department of Energy and Hydrocarbon Chemistry, Graduate School
of Engineering, Kyoto University, Kyoto, Japan
- 9.30 *FE-1:L09* **Direct Utilisation of Dry Ethanol in Solid Oxide Fuel Cells Using a Perovskite Anode Modified with Ni-alloy @ FeOx Core-shell Nanoparticles**
M. LO FARO, S.C. ZIGNANI, S. TROCINO, S. MAISANO, **A.S. ARICO**¹, Institute of Advanced Energy Technologies (ITAE) - Italian National Research Council (CNR), Messina, Italy; R.M. REIS, G.G.A. SAGLIETTI, V. OLIVEIRA, E.A. TICIANELLI, Instituto de Quimica de São Carlos - USP, Brazil; N. HODNIK, F. RUIZ-ZEPEDA, National Institute of Chemistry - Ljubljana, Slovenia
- 10.00 *FE-1:L10* **Direct Addition of Lithium and Cobalt Oxide to Ce_{0.8}Gd_{0.2}O_{1.95} Electrolytes to Improve Microstructural an Electrochemical Properties in IT-SOFC at Lower Sintering Temperature**
G. ACCARDO¹, D. FRATTINI², H.C. HAMC¹, S.P. YOON¹, ¹Fuel Cell Research Center, Korea Institute of Science and Technology, Seoul, South Korea; ²Graduate school of Energy and Environment, Seoul National University of Science and Technology, South Korea
- 10.30 *Break*

Chair: Koichi EGUCHI, Japan

- 11.00 *FE-1:L11* **Study of Materials Based on La_{0.6}Sr_{0.4}Fe_{1-y}CoyO_{3-x} for Cathodes of Intermediate Temperature Solid Oxide Fuel Cells, (IT-SOFCs)**
J. TARTAJ SALVADOR, Instituto de Cerámica y Vidrio (CSIC), Madrid, Spain
- 11.30 *FE-1:L12* **Bioethanol Fed Directly to Commercial Solid Oxide Fuel Cells**
S. TROCINO¹, S.C. ZIGNANI¹, R.M. REIS², G.G.A. SAGLIETTI², V. OLIVEIRA², E.A. TICIANELLI², A.S. ARICO¹, M. LO FARO¹, ¹Institute of Advanced Energy Technologies (ITAE) of the Italian National Research Council (CNR), Messina, Italy; ²Instituto de Quimica de São Carlos - USP, Brazil

Room: **SALA RELATORI**

Session FF-1 - Theoretical Concepts and Basic Approaches for High Efficiency Thermal-to-electrical Energy Conversion

Chair: Georg MADSEN, Austria

9.30 *FF-1:IL05* **Electric Power Generation from Waste Heat without Temperature Gradient**

SHINJI MUNETOH, YUKI OSAKABE, OSAMU FURUKIMI, Kyushu University, Fukuoka, Japan

10.10 *FF-1:IL06* **Ab Initio Calculations as a Guiding Tool for the Study of Phase Stability of Thermoelectric Materials**

D. FUKS, Y. GELBSTEIN, Materials Engineering Department, Ben Gurion University of the Negev, Beer Sheva, Israel

10.50 *Break*

Chair: Janusz TOBOLA, Poland

11.20 *FF-1:IL07* **Structuring Intuition with Theory: The High-throughput Way**

M. FORNARI, Department of Physics and Science of Advanced Materials Program, Central Michigan University, Mount Pleasant, MI, USA

Session FF-2 - Novel Materials for High Efficiency Thermal-to-electrical Energy Conversion

12.00 *FF-2:IL02* **Towards a Magnesium-silicide Based Thermoelectric Generator: Material and Contact Development for n- and p-type Magnesium Silicide Based Solid Solutions**

J. DE BOOR¹, H. KAMILA¹, P. PONNUSAMY¹, M. YASSERI^{1,2}, A. SANKHLA¹, N.H. PHAM¹, N. FARAHI¹, E. MÜLLER^{1,2}, ¹Institute of Materials Research, German Aerospace Center, Koeln, Germany, ²Institute of Inorganic and Analytical Chemistry, Justus Liebig University Giessen, Giessen, Germany

Room: **SPOLETO A**

Session FG-1 - Hard Magnetic Materials

Chair: Yusuke HIRAYAMA, Japan

- 9.00 *FG-1:IL07* **Hard Magnetic Materials based on Nanowires**
J. PING LIU, Department of Physics, University of Texas at Arlington,
Arlington, TX, USA
- 9.30 *FG-1:IL08* **Recent Advances in Micro-magnetic Modelling of
Permanent Magnets**
T. SCHREFL, A. KOVACS, J. FISCHBACHER, M. GUSENBAUER,
Danube University Krems, Wiener Neustadt, Austria
- 10.00 *FG-1:IL09* **Novel Developments in Hybrid Ferrite-based Hard
Nano-materials**
C. DE JULIAN FERNANDEZ, IMEM - CNR, Parma, Italy
- 10.30 *Break*

Chair: J. Ping LIU, USA

- 11.00 *FG-1:IL10* **New Processing of RE-based Magnetic Materials**
S. KOBE, Jožef Stefan Institute, Ljubljana, Slovenia
- 11.30 *FG-1:IL11* **Study of Anisotropic Bonded Permanent Magnetic
Materials**
JINBO YANG, JINGZHI HAN, School of Physics, Peking University,
Beijing, China
- 12.00 *FG-1:IL12* **Towards the Optimized Use of Permanent Magnets:
Development of 3d Printed Magnets**
D. SUESS¹, C. HUBER¹, S. SCHUSCHNIGG³, M. GRÖNEFELD³,
¹Christian Doppler Laboratory for Advanced Magnetic Sensing
and Materials, Faculty of Physics, University of Vienna, Vienna,
Austria; ²Magnetfabrik Bonn GmbH, Bonn, Germany; ³Department
of Polymer Engineering and Science, Montanuniversitaet Leoben,
Leoben, Austria

Room: **SALA STAMPA**

Session FH-1 - Design Elements and Advanced Concepts for Photofunctional Materials

Chair: Csaba JANAKY, Hungary

- 9.00 *FH-1:IL05* **Mechanistic Aspects of Photocatalysis - Control of Photoinduced Redox Processes**
W. MACYK, M. KOBIELUSZ, M. TROCHOWSKI, M. SUROWKA, M. PACIA, J. KUNCEWICZ, Faculty of Chemistry, Jagiellonian University in Kraków, Kraków, Poland
- 9.40 *FH-1:IL06* **The Photochemical Reactivity of Polar Surface Domains on Non-polar Surfaces**
G.S. ROHRER, P.A. SALVADOR, Carnegie Mellon University, Dept. of Materials Science and Engineering, Pittsburgh, PA, USA
- 10.20 *FH-1:IL07* **Nano-graphitic Templates and Hierarchical Nanostructures in Multi-functional Electrocatalysts for the Artificial Leaf**
G. VALENTI, A. BONI, M. MARCACCIO, S. RAPINO, M. IURLO, F. PAOLUCCI, University of Bologna, Bologna, Italy; P. FORNASIERO, M. PRATO, University of Trieste, Italy; M. BONCHIO, University of Padua, Italy
- 11.00 *Break*

Session FH-2 - Understanding Fundamentals of Photo-induced Processes and Charge Transport

Chair: Jennifer STRUNK, Germany

- 11.20 *FH-2:IL01* **Atomic Level In situ Microscopy and Spectroscopy of Photocatalyst for Water Splitting**
D. HAIBER, Q. LIU, T. BOLAND, **P. A. CROZIER**, Arizona State University, Tempe, AZ, USA
- 12.00 *FH-2:IL02* **Role of Radical Species and Interparticle Electron Transfer in Photocatalysis**
D. BAHNEMANN, Institut fuer Technische Chemie, Gottfried Wilhelm Leibniz Universitaet Hannover, Hannover, Germany
- 12.40 *FH-2:L07* **Electron Transfer and Energy Transfer in Heterogenous Photocatalysis**
F. PARRINO, L. PALMISANO, Dipartimento di Energia, Ingegneria dell'Informazione e Modelli Matematici (DEIM), Università degli Studi di Palermo, Palermo, Italy

Room: **BEVAGNA**

Session FI-1 - Material Design and Processing

Chair: Ken-Tsung WONG, Taiwan

- 9.00 *FI-1:IL05* **Materials and Device Design for Improving the Stability of OLEDs**
HIROHIKO FUKAGAWA¹, YUKIKO IWASAKI¹, TSUBASA SASAKI¹, MUNEHIRO HASEGAWA², KATSUYUKI MORII², TAKAHISA SHIMIZU¹, ¹Japan Broadcasting Corporation (NHK), Science & Technology Research Laboratories, Setagaya-ku, Tokyo, Japan; ²Nippon Shokubai Co., Ltd., Suita, Osaka, Japan
- 9.40 *FI-1:IL06* **Feasibility of Future GaN Large Area Light Emitting Devices**
HIROSHI FUJIOKA, K. UENO, A. KOBAYASHI, Institute of Industrial Science, The University of Tokyo, Meguro-ku, Tokyo, Japan; ACCEL-JST, Chiyoda-ku, Tokyo, Japan
- 10.20 *FI-1:L07* **Recent Progress and Challenges of InN and In-rich InGaN by RF-MBE**
YASUSHI NANISHI¹, TOMOHIRO YAMAGUCHI², TSUTOMU ARAKI¹, ¹Ritsumeikan University, Kusatsu, Sjiga, Japan; ²Kogakuin University, Hachioji, Tokyo, Japan
- 10.50 *Break*

Chair: Takuma YASUDA, Japan

- 11.20 *FI-1:IL08* **New Blue Organic Emitters for OLED Lightings**
JONGWOOK PARK, Department of Chemical Engineering, Kyung Hee University, Deogyeong, Giheung, Yongin, Kyunggi, South Korea
- 12.00 *FI-1:L09* **Transparent Spinel ceramics for White Light-Emitting Diodes Applications**
M. RADWAN, J. SEDLACEK, Z. LENCES, P. SAJGALIK, Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava, Slovakia

Room: **CASCIA**

Session FJ-1 - Fundamentals

Chair: Ian POVEY, Ireland

9.30 *FJ-1:IL06* **Thio- and Seleno-cyanates: Theory and Applications for an Emerging Class of Multi-functional Materials**

L. TSETSERIS, Department of Physics, National Technical University of Athens, Zografou Campus, Athens, Greece

10.10 *FJ-1:IL08* **Thermal Transport in Transparent Conductive Oxide Films**

NOBUTO OKA¹, Y. SHIGESATO², ¹Kindai University, Iizuka, Fukuoka, Japan; ²Aoyama Gakuin University, Sagami-hara, Kanagawa, Japan

10.50 *Break*

Chair: Nobuto OKA, Japan

11.20 *FJ-1:IL09* **First-principles Modeling of Complex Oxide Interfaces**

C.G. VAN DE WALLE, Materials Department, University of California, Santa Barbara, CA, USA; **A. JANOTTI**, University of Delaware, Newark, DE, USA

12.00 *FJ-1:IL10* **Ab Initio Design of P-type Transparent Conductors: From Oxides to Oxide Chalcogenides**

G. TRIMARCHI, Department of Chemistry, Northwestern University, Evanston, IL, USA

Room: **SPOLETO B**

Session FK-1 - Structural Components for Nuclear Fission and Fusion Applications

Chair: Thak Sang BYUN, USA

- 9.00 *FK-1:IL04* **Tungsten Powder Injection Molding @ KIT: Achievements and Trends**
S. ANTUSCH, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany
- 9.30 *FK-1:IL05* **The Theory of Precipitation Hardening Revisited: The Effect of Crystal Structure on the Obstacle Strength**
YOSHITAKA MATSUKAWA, Tohoku University, Sendai, Japan
- 10.00 *FK-1:L06* **Improvement of Density and Strength of CVI-processed SiCf/SiC Composites by Applying SiC Nanowires**
DAEJONG KIM, HO WOOK LEE, SEUNGHO LEE, HYEON-GEUN LEE, JI YEON PARK, WOEN-JU KIM, Korea Atomic Energy Research Institute, Daejeon, South Korea
- 10.20 *FK-1:L07* **Development of the Nanostructured Ferritic Alloy OFRAC (Fe-12Cr-MoTiNb) for Fast Reactor Advanced Fuel Cladding**
D.T. HOELZER, C.P. MASSEY, K.A. TERRANI, Oak Ridge National Laboratory, Oak Ridge, TN, USA
- 10.40 *FK-1:L08* **Microstructural Evolution of Oxide Dispersion Strengthened Alloys under Temperature and Stress**
JINSUNG JANG, TAE KYU KIM, WOO GON KIM, CHANG HEE HAN, Korea Atomic Energy Research Institute, South Korea; XIAODONG MAO, Institute of Nuclear Energy Safety Technology, CAS, China; MAN WANG, HEUNG NAM HAN, Seoul National University, South Korea
- 11.00 *Break*

Session FK-2 - Low Activation Structural Materials for Nuclear Fusion Systems

Chair: Steffen ANTUSCH, Germany

- 11.20 *FK-2:IL01* **Hydrogen Isotope Retention in Low-activation Structural Materials**
A.V. SPITSYN, N.P. BOBYR, A.V. GOLUBEVA, NRC Kurchatov Institute, Moscow, Russia; V.M. CHERNOV, VNIINM, Moscow; Russia
- 11.50 *FK-2:IL02* **Expanding the Operation Window of RAFM Steels by Optimized Chemical Compositions and Heat Treatments**
J. HOFFMANN, M. RIETH, M. KLIMENKOV, S. BAUMGÄRTNER, Karlsruhe Institute of Technology, Karlsruhe, Germany
- 12.20 *FK-2:IL03* **Sputter-erosion of Low-activation Steel**
M. OBERKOFER¹, R. ARREDONDO PARRA¹, M. BALDEN¹, S. ELGETI¹, H. GREUNER¹, W. JACOB¹, M. MAYER¹, R. NEU¹, T. SCHWARZ-SELINGER¹, T.F. SILVA^{1,2}, KAZUYOSHI SUGIYAMA¹, U. VON TOUSSAINT¹, ¹Max Planck Institute for Plasma Physics, Garching, Germany; ²Instituto de Física da Universidade de São Paulo, São Paulo, Brazil
- 12.50 *FK-2:L04* **Treatment of Constructional Materials of Fuel Rod Cladding and Fuel Assemblies in the Processing of Spent Nuclear Fuel of the Reactor Facility Brest-300**
V. KASCHEEV, High-Tech Institute of Inorganic Materials, Moscow, Russia

Focused Session FK-10
**MATERIALS ISSUES IN NUCLEAR WASTE
TREATMENT AND DISPOSAL**

Room: **VIP**

Chair: Kevin FOX, USA (*Convener*)

9.25 *Welcome*

Session FK-10.1 - Waste Form Development

- 9.30 *FK-10.1:IL01* **Recent Advances in the Immobilization of Low- or Intermediate-level Radioactive Waste in Cementitious Materials**
C. CAU DIT COUMES, J.B. CHAMPENOIS, A. POULESQUEN, D. LAMBERTIN, CEA, DEN, DE2D, SEAD, Bagnols-sur-Cèze, France
- 10.00 *FK-10.1:IL02* **Phosphate-based Glasses and Glass Ceramics for Immobilization of Lanthanides and Actinides**
S.V. STEFANOVSKY, O.I. STEFANOVSKY, Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, Russia; S.E. VINOKUROV, Vernadsky Institute of Geochemistry and Analytical Chemistry RAS, Russia
- 10.30 *FK-10.1:L03* **Synthesis and Thermal Behavior of Thorium-incorporated Rhabdophane**
DANWEN QIN, A. MESBAH, S. SZENKNECT, N. CLAVIER, N. DACHEUX, Institut de Chimie Séparative de Marcoule, Bagnols sur Cèze Cedex, France
- 10.50 *Break*

Chair: Sergey STEFANOVSKY, Russia

- 11.20 *FK-10.1:IL04* **Immobilization of Fission Products in Glass and Glass Ceramic Matrices**
S. SCHULLER, E. REGNIER, J. FOURNIER-RENAUD, H. PABLO, CEA, DEN, DE2D, SEVT, Bagnols-sur-Cèze, France
- 11.50 *FK-10.1:L06* **Thorium Incorporation in the Xenotime Based Ceramic**
A. MESBAH¹, N. CLAVIER¹, S. SZENKNECT¹, J. LOZANO-RODRIGUEZ², N. DACHEUX¹, ¹ICSM, UMR 5257 CNRS - CEA - ENSCM - Université de Montpellier, Site de Marcoule - Bat 426, Bagnols/Cèze, France; ²HZDR, Institute of Resource Ecology, the Rossendorf Beamline at ESRF, Grenoble, France

Room: **MAGIONE A**

Session FL-1 - Classes of Materials and their Synthesis and Chemical Modification

Chair: Guglielmo LANZANI, Italy

- 9.30 *FL-1:IL05* **Synthesis and Characterization of Micro- and Nano-structured Surfaces for Controlling Selective Cell Response**
C. AKTAS, AYMAN HAIDAR, MICHAEL VEITH, FRANZ FAUPEL, HASHIM ABDUL-KHALIQ, Kiel, Germany
- 10.10 *FL-1:IL06* **Photosynthetic Enzymes as Photoactive Soft Materials**
F. MILANO, S. LA GATTA, A. AGOSTIANO, M. DELL'EDERA, R. RAGNI, G.M. FARINOLA, **M. TROTTA**, Istituto per i Processi Chimico Fisici - CNR - Bari; Dipartimento di Chimica, Università di Bari, Bari, Italy
- 10.50 *Break*

Chair: Emilio PARISINI, Italy

- 11.20 *FL-1:L07* **Investigation of Leaf Shape and Edge Design for Faster Evaporation in Biomimetic Heat Dissipation Systems**
P. GRUBER, A. RUPP, University of Akron, Biomimicry Research and Innovation Center BRIC, Akron, OH, USA
- 11.50 *FL-1:L08* **Polymer Brushes Grafted into Supported Porous Oxide Films Generating 3-D Non-fouling Surfaces**
M. ES-SOUNI, Institute for Materials & Surface Technology, Kiel University of Applied Sciences, Kiel, Germany

Room: **ORVIETO A**

Session FM-1 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

Chair: Stefano BRIVIO, Italy

9.00 *FM-1:IL01* **NVM Technologies Based on Ferroelectric Hafnium Oxide**

T. MIKOLAJICK^{1,2}, T. SCHENK¹, T. MITTMANN¹, M. HOFFMANN¹, B. MAX², C. RICHTER¹, M. PESIC¹, F. FENGLER¹, H. MULAOSMANOVIC¹, M.-H. PARK¹, S. SLESAZECK¹, U. SCHROEDER¹, J. MÜLLER³, P. POLAKOWSKI³, S. MÜLLER⁴, R. MATERLIK⁵, A. KERSCH⁵, ¹NaMLab gGmbH, Dresden, Germany; ²Chair of Nanoelectronic Materials, TU Dresden, Dresden, Germany; ³Fraunhofer IPMS-CNT, Dresden; ⁴FMC GmbH, Dresden, Germany; ⁵Munich University of Applied Sciences, Munich, Germany

Session FM-3 - Emerging Applications for Non-volatile Memories

9.30 *FM-3:IL08* **Spintronics Memories for Bio-inspired Computing**

D. QUERLIOZ, A.F. VINCENT, A. MIZRAHI, D. VODENICAREVIC, T. HIRTZLIN, J.S. FRIEDMAN, N. LOCATELLI, J. GROLLIER, University Paris-Sud, Orsay, France

10.00 *FM-3:L12* **Emerging Applications for Electroforming-free Perovskite Memristors**

H. SCHMIDT^{1,2,3,5}, NAN DU^{1,4}, D. BÜRGER^{1,4}, I. SKORUPA³, R. ECKE⁴, S.E. SCHULZ⁴, ¹Materials systems for Nanoelectronics, Chemnitz University of Technology, Chemnitz, Germany; ²Faculty of Physics, Friedrich-Schiller University of Jena, Jena, Germany; ³Leibniz-Institut für Photonische Technologien e.V. (IPHT), Jena, Germany; ⁴Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, Dresden, Germany; ⁵Fraunhofer-Institut für Elektronische Nanosysteme, Abteilung Back-End of Line, Chemnitz, Germany

10.20 *Break*

Chair: Damien QUERLIOZ, France

10.50 *FM-3:IL09* **Spintronic Analog Memory for Neuromorphic Computing**

SHUNSUKE FUKAMI^{1,2,3,4}, W.A. BORDERS¹, A. KURENKOV¹, C. ZHANG^{1,2}, S. DUTTAGUPTA^{1,3}, H. OHNO^{1,2,3,4,5}, ¹Laboratory for Nanoelectronics and Spintronics, RIEC, Tohoku University, Japan; ²Center for Spintronics Integrated Systems, Tohoku University, Japan; ³Center for Innovative Integrated Electronic Systems, Tohoku University, Japan; ⁴Center for Spintronics Research Network, Tohoku University, Japan; ⁵WPI-Advanced Institute for Materials Research, Tohoku University, Japan

11.20 *FM-3:L10* **Understanding Organic Spintronic Devices and their Applications to Neuromorphic Computing**

A. RIMINUCCI¹, ZHI-GANG YU², M. CALBUCCI¹, R. CECCHINI¹, P. GRAZIOSI¹, M. PREZIOSO³, I. BERGENTI¹, A. DEDIU¹, ¹Institute for the Study of Nanostructured Materials, CNR, Bologna, Italy; ²ISP/ Applied Sciences Laboratory, Washington State University, Spokane, WA, USA; ³Department of Electrical and Computer Engineering, University of California at Santa Barbara, Santa Barbara, CA, USA

11.40 *FM-3:L16* **A RRAM-based Self-organizing Neural Network**

M. PEDRO, J. MARTIN-MARTINEZ, R. RODRIGUEZ, M. NAFRIA, Departament d'Enginyeria Electrònica, Universitat Autònoma de Barcelona (UAB), Cerdanyola del Valles, Barcelona, Spain

Room: **ORVIETO B**

Session FN-1 - Growth and Processing

Chair: Ester VAZQUEZ, Spain

- 9.30 *FN-1:IL07* **Controlled Growth of High-quality Graphene and Various 2D Materials for Enhancing their Applications**
HIROKI AGO, Global Innovation Center (GIC), Kyushu University, Fukuoka, Japan and National Institute for Advanced Science and Technology (AIST), Tsukuba, Japan
- 10.00 *FN-1:IL08* **Biomimetic On-surface Growth of Graphene Nanoribbons**
HIROSHI SAKAGUCHI, Institute of Advanced Energy, Kyoto University, Kyoto, Japan
- 10.30 *FN-1:IL09* **Towards the Intrinsic Mobility Limit of CVD Grown Graphene**
C. STAMPFER, JARA-FIT and 2nd Institute of Physics, RWTH Aachen University, Germany
- 11.00 *Break*

Chair: Hiroshi SAKAGUCHI, Japan

- 11.30 *FN-1:IL12* **Epitaxial Graphene on SiC - Status and Prospects**
R. YAKIMOVA, I. SHTEPLIUK, M. VAGIN, I.G. IVANOV, T. IAKIMOV, G.R. YAZDI, J. ERIKSSON, Linköping University, IFM, Linköping, Sweden
- 12.00 *FN-1:L13* **Integrated Synthesis of Nitrogen and Sulfur Co-doped Carbon Spheres from Melamine and Diaminobenzenesulfonic Acid as Superior Catalyst for Selective Oxidation of Aromatic Alkanes**
RONGWEN LYU, M.H. LIU, Dalian University of Technology, Dalian, Liaoning, China
- 12.20 *FN-1:L15* **New Approaches for Preparation of Graphene-based Structures with the Intended Chemical Composition from Graphene Oxide**
M.K. RABCHINSKII, A.T. DIDEIKIN, M.V. BAIDAKOVA, V.V. SHNITOV, D.A. KIRILENKO, S.V. KONIAKHIN, A. YA. VUL', Ioffe Institute, St.Petersburg, Russia; F. Roth, TU Bergakademie, Freiberg, Germany

Room: **MONTEFALCO**

Session FO-1 - Materials, Structure, Physical Chemistry and General Properties

Chair: Dario DAGHERO, Italy

- 9.00 *FO-1:IL04* **Superconductor / Ferromagnet Films and Superconducting Spintronics**
M.G. BLAMIRE, Department of Materials Science, University of Cambridge, Cambridge, UK
- 9.30 *FO-1:IL05* **Phenomenological Interpretations of DFT Calculations for Superconductors**
J.A. ALARCO, P.C TALBOT, I.D.R. MACKINNON, Institute for Future Environments, and Science and Engineering Faculty, Queensland University of Technology, Brisbane, Queensland, Australia
- 9.50 *FO-1:IL06* **New Process for Growing the $\text{HgBa}_2\text{Ca}_2\text{Cu}_3\text{O}_{8+\delta}$ Superconductors with the Highest Critical Temperature at Ambient Pressure**
B. LORET, A. FORGET, J.-B. MOUSSY, **D. COLSON**, SPEC, CEA, CNRS-UMR 3680, Université Paris-Saclay, Gif sur Yvette Cedex, France; S. POISSONNET, P. BONNAILLIE, SRMP, DMN, CEA, Université Paris-Saclay, Gif sur Yvette Cedex, France; G. COLLIN, LPS, C.N.R.S. UMR 8502, Université Paris-Sud, Orsay, France; P. THUÉRY, NIMBE, CEA, CNRS, Université Paris-Saclay, Gif sur Yvette Cedex, France; B. LORET, A. SACUTO, Laboratoire Matériaux et Phénomènes Quantiques, Paris Cedex, France

10.10 *Break*

Session FO-3 - Properties of Superconductors

Chair: Jinho LEE, South Korea

- 10.40 *FO-3:IL01* **Towards Atomic-scale Andreev Reflection**
JOHN Y.T. WEI, University of Toronto & Canadian Institute for Advanced Research, Toronto, Canada
- 11.10 *FO-3:IL02* **What do we Really Understand in all Novel High-Tc Superconductors: Orbitals in Three Dimensions**
D.K. SUNKO, Department of Physics, Faculty of Science, University of Zagreb, Zagreb, Croatia
- 11.40 *FO-3:IL03* **Collapse of High-Tc Superconductivity via Ultrafast Quenching of the Phase Coherence**
F. BOSCHINI¹, E. RAZZOLI¹, E.H. DA SILVA NETO², M. ZONNO¹, G. LEVY¹, G.G. GU³, D.J. JONES¹, G. GIANNETTI⁴, A. DAMASCELLI¹,
¹Quantum Matter Institute, University of British Columbia, Vancouver, Canada; ²UC Davis, Davis, USA; ³Brookhaven National Laboratory, Upton, USA; ⁴Università Cattolica del Sacro Cuore, Brescia, Italy
- 12.10 *FO-3:IL04* **Analyzing Supercurrents with x-ray Eyes**
J. ALBRECHT, Research Institute for Innovative Surfaces FINO, Aalen University, Germany; J. SIMMENDINGER, S. RUOSS, G. SCHÜTZ, MPI for Intelligent Systems, Stuttgart, Germany

Room: **MAGIONE B**

Session FP-1 - Advances in Biomaterials

Chair: James HENDERSON, USA

- 9.30 *FP-1:IL06* **Development of Novel Antibacterial Nanoparticles Suitable for Coating on Intravascular Catheters**
TSUTOMU FURUZONO, Department of Biomedical Engineering, Faculty of Biology-Oriented Science and Technology, Kindai University, Kinokawa, Japan
- 10.00 *FP-1:IL07* **Implementing Multifunctionality in Polymer-based Biomaterials**
A. LENDLEIN^{1,2}, ¹Institute of Biomaterial Science and Berlin-Brandenburg Centre for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany; ²University of Potsdam, Potsdam, Germany
- 10.30 *FP-1:IL08* **Design of Adhesive Growth Factors**
YOSHIHIRO ITO, Nano Medical Engineering Laboratory, RIKEN, Japan Emergent Bioengineering Materials Research Team, RIKEN Center for Emergent Matter Science, Japan
- 11.00 *Break*

Chair: Andreas LENDLEIN, Germany

- 11.30 *FP-1:L09* **Next Generation Nanofiber Structures for Regenerative Engineering**
N. NAGIAH, L.S. NAIR, **C. LAURENCIN**, M. BHATTACHARJEE, The Institute for Regenerative Engineering, University of Connecticut Health Center, University of Connecticut, Farmington, CT, USA

Session FP-2 - Tissue Engineering and Regenerative Medicine

- 11.50 *FP-2:IL02* **Guided Bone/Tendon Regeneration by Growth Factor-Immobilized Asymmetrically Porous Membranes**
JIN HO LEE, Hannam University, Daejeon, South Korea

TUESDAY JUNE 12 AFTERNOON

Room: **CORCIANO**

Session FA-1 - Materials and Fabrication Processes

Chair: Rylie GREEN, UK

- 14.30 *FA-1:IL11* **Rehealable and Recyclable Artificial e-skin**
JIANLIANG XIAO, Department of Mechanical Engineering,
University of Colorado Boulder, CO, USA
- 15.10 *FA-1:L12* **Freestanding Ultrathin and Ultraconformable PVF
Capacitors**
J. BARSOTTI, The Biorobotics Institute, Scuola Superiore
Sant'Anna & Center for Micro-BioRobotics @SSSA, Istituto Italiano
di Tecnologia, Pontedera, Italy; I. HIRATA*, M. CAIRONI, Center
for Nano Science and Technology @PoliMi, Istituto Italiano di
Tecnologia, Milano, Italy; F. GRECO**, V. MATTOLI, Center for Micro-
BioRobotics @SSSA, Istituto Italiano di Tecnologia, Pontedera, Italy;
*At present at Center for Micro-BioRobotics @SSSA, Istituto Italiano
di Tecnologia, Pontedera, Italy; **At present at Institute of Solid State
Physics, Graz University of Technology, Graz, Austria
- 15.40 *FA-1:L13* **Thin Functional Dielectric Elastomer for Stretchable
Devices**
D.M. OPRIS¹, S.J. DÜNKI^{1,2}, YEE SONG KO^{1,2}, E. PERJU^{1,3}, P.
CASPARI^{1,2}, D. DAMJANOVIC², Y. SHEIMA¹, F.A. NÜESCH^{1,2}, ¹Swiss
Federal Laboratories for Materials Science and Technology Empa,
Duebendorf; ²Ecole Polytechnique Fédérale de Lausanne (EPFL),
Switzerland; ³"Petru Poni" Institute of Macromolecular Chemistry of
Romanian Academy, Romania
- 16.10 *Break*

Session FA-2 - Device Physics, Mechanics and Design

Chair: Jonathan REEDER, USA

- 16.40 *FA-2:IL01* **Mechanical Properties of Organic Semiconductors
for Stretchable and Mechanically Robust Electronics**
D.J. LIPOMI, Department of NanoEngineering, University of
California, San Diego, La Jolla, CA, USA
- 17.20 *FA-2:IL02* **Mechanical Reliability of Advanced Thin Films**
TAEK-SOO KIM, Department of Mechanical Engineering, KAIST,
Daejeon, South Korea

TUESDAY JUNE 12 AFTERNOON

Room: **ASSISI A**

Session FB-1 - Thin-film Photovoltaics

Chair: Kenji YOSHINO, Japan

- 14.30 *FB-1.3:IL01* **Development of ZnSnP₂ Solar Cells: A Novel Absorber Material**
YOSHITARO NOSE, SHIGERU NAKATSUKA, Kyoto University, Kyoto, Japan, SHUNSUKE AKARI, JAKAPAN CHANTANA, TAKASHI MINEMOTO, Ritsumeikan University, Japan
- 15.00 *FB-1.3:IL02* **Development of Antimony Selenide Solar Cells by a Scalable Deposition Route**
L.J. PHILLIPS¹, P.J. YATES¹, H. SHIEL¹, O.S. HUTTER¹, M. BIRKETT¹, S. MARIOTTI¹, C. SAVORY², K. DUROSE¹, D.O. SCANLON², T.D. VEAL¹, **J.D. MAJOR**¹, ¹Department of Physics, University of Liverpool, UK; ²Department of Chemistry, University College London, UK
- 15.30 *FB-1.3:IL03* **Kesterite Thin Film Solar Cells Prepared by Chemical Route**
SHIGERU IKEDA¹, THI HIEP NGUYEN², TAKASHI HARADA², ¹Department of Chemistry, Konan University, Kobe, Japan, ²Research Center of Solar Energy Chemistry, Osaka University, Toyonaka, Japan
- 16.00 *FB-1.3:L04* **Silicon Heterojunction with Organic Thin Layer (HOT) Solar Cells**
HAJIME SHIRAI, RYO ISHIKAWA, TAKUYA MIURA, Saitama University, Saitama, Japan
- 16.20 *Break*

Session FB-3 - Organic, Dye Sensitised and Nanoparticle Photovoltaics

Chair: Budhika MENDIS, UK

- 16.50 *FB-3:IL01* **Design of Molecular Donor and Acceptor Materials for Organic Solar Cells**
P. BLANCHARD, MOLTECH-Anjou, UMR CNRS 6200, University of Angers, Angers, France
- 17.20 *FB-3:L03* **Improve the Photo-stability by Controlling the Chemical Structures of Photoactive Materials for Polymer Solar Cells**
VU VAN DOAN^{1,2}, QUOC VIET HOANG^{1,2}, RASOOL SHAFKAT^{1,2}, CHANG EUN SONG^{1,2}, **WON SUK SHIN**^{1,2}, ¹Energy Materials Research Center, Advanced Materials Division, Korea Research Institute of Chemical Technology (KRICT), Daejeon, South Korea; ²Department of Advanced Materials and Chemical Engineering, University of Science and Technology (UST), Daejeon, South Korea

Room: **ASSISI B**

Session FC-2 - Hydrogen Storage

Chair: Andrea BALDI, Netherlands

14.30 *FC-2.6:IL01* **Proton Transfer through the Bulk and Near Surface Catalysis in Nickel Oxides**

M. CASPARY TOROKER, Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Technion City, Israel

15.00 *FC-2.6:L02* **Theoretical Analysis of Alkali Metal and Magnesium Closo-Boranes**

A.E. MANIADAKI, Z. LODZIANA, Institute of Nuclear Physics - PAS, Kraków, Poland

15.20 *Break*

Chair: Michel LATROCHE, France

15.50 *FC-2.1:IL01* **Metallic Nanoparticles in Hydrogen Storage and Conversion**

N. PATELLI, M. CALIZZI¹, **L. PASQUINI**, Department of Physics and Astronomy, University of Bologna, Bologna, Italy; ¹Present address: Institut des Sciences et Ingénierie Chimiques, EPFL, Lausanne, Switzerland

16.20 *FC-2.1:IL02* **Hydrogen Storage in Individual Nanoparticles**

A. BALDI, DIFFER - Dutch Institute for Fundamental Energy Research, Eindhoven, Netherlands

Room: **NORCIA**

Session FD-1 - Batteries

Chair: Steve G. GREENBAUM, USA

14.30 *FD-1:IL14* **New Polyanionic Electrodes for Secondary Batteries: Few Case Studies**

P. BARPANDA, Indian Institute of Science, Bangalore, India

15.10 *FD-1:IL15* **Singlet Oxygen in Non-aqueous Battery Chemistries**

N. MAHNE, L. SCHAFZAHN, E. MOURAD, Y. PETIT, B. SCHAFZAHN, C. SLUGOVIC, S. BORISOV, **S.A. FREUNBERGER**, Graz University of Technology, Graz, Austria; O. FONTAINE, University of Montpellier, France; D. KRAMER, University of Southampton, UK

15.50 *Break*

16.20 *FD-1:IL21* **Ionic Liquid-based Electrolytes for Safe Lithium-ion Batteries**

A. MORETTI, **S. PASSERINI**, Helmholtz Institute Ulm, Karlsruhe Institute of Technology, Ulm, Germany

Room: **SPELLO**

Chair: K. Andreas FRIEDRICH, Germany

Session FE-1 - Solid Oxide Fuel Cells (SOFCs)

- 14.30 *FE-1:L14* **Robust Nano-particles on Active Perovskite Oxide Anode for Solid Oxide Electrochemical Cells**
TAE HO SHIN, HANBIT KIM, Korea Institute of Ceramic Engineering & Technology, Jinju-si, South Korea

Session FE-2 - Proton-conducting (PEFCs) and Alkaline (AFCs) Polymer Electrolyte Fuel Cells

- 15.10 *FE-2:IL01* **Anion Exchange Membranes, Stable in Hot Caustic Solutions**
S. HOLDCROFT, Department of Chemistry, Simon Fraser University, Burnaby, Greater Vancouver, BC, Canada

15.50 *Break*

- 16.20 *FE-2:IL02* **Möbbauser Spectroscopy in Fuel Cell Electrocatalysis of Non-precious Metal Catalysts**
U.I. KRAMM, TU Darmstadt, Catalysts and Electrocatalysts, Darmstadt, Germany

TUESDAY JUNE 12 AFTERNOON

Room: SALA RELATORI

Session FF-2 - Novel Materials for High Efficiency Thermal-to-electrical Energy Conversion

Chair: Johannes DE BOOR, Germany

- 14.30 *FF-2:IL04* **Thermoelectric Properties in Dirac/Weyl Semimetals**
QIANG LI, Condensed Matter Physics & Materials Science Department, Brookhaven National Laboratory, Upton, New York, USA
- 15.10 *FF-2:IL09* **Thermal Conductivity over Engineered Inorganic-organic Interfaces**
M. KARPPINEN, Aalto University, Department of Chemistry and Materials Science, Espoo, Finland
- 15.50 *Break*

Session FF-1 - Theoretical Concepts and Basic Approaches for High Efficiency Thermal-to-electrical Energy Conversion

Chair: David FUKS, Israel

- 16.20 *FF-1:IL08* **Ab Initio Calculations of the Thermal Conductivity, Discovery of New Materials, and Multi-scale Modeling**
L. CHAPUT, LEMTA, CNRS UMR-7563, Univ. Lorraine, Vandoeuvre les Nancy, France
- 17.00 *FF-1:L10* **Advanced Protective Layers for Improved Chemical Stability and Corrosion Resistance in CoSb₃ and Mg₂Si Based Materials - Experimental and Theoretical Aspects**
A. KOLEZYNSKI, J. LESZCZYNSKI, P. NIERODA, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland
- 17.30 *FF-1:IL09* **Thermal Transport and Chemical Bonding in Clathrates**
Y. GRIN, Max-Planck-Institut für Chemische Physik fester Stoffe, Dresden, Germany

Room: **SPOLETO A**

Session FG-2 - Soft Magnetic Materials

Chair: Eva M. PELLICER, Spain

- 14.30 *FG-2:IL02* **Magnetic Sensors and Actuators Based on Soft Magnetic Materials**
C. GOMEZ-POLO, I. ROYO-SILVESTRE, J.M. JIMENEZ-RUIZ, J.J. BEATO-LOPEZ, Physics Department & Institute for Advanced Materials (INAMAT), Universidad Pública de Navarra, Pamplona, Spain
- 15.00 *FG-2:IL03* **Engineering of Soft Magnetic Properties of Amorphous and Nanocrystalline Magnetic Microwires for Sensor Applications**
A. ZHUKOV^{1,2,3}, M. IPATOV^{1,2}, A. TALAAT^{1,2}, J.M. BLANCO², M. CHURYUKANOVA⁴, V. ZHUKOVA^{1,2}, ¹Dept. Phys. Mater., University of Basque Country, UPV/EHU San Sebastián, Spain; ²Dpto. de Física Aplicada, EUPDS, UPV/EHU, San Sebastian, Spain; ³IKERBASQUE, Basque Foundation for Science, Bilbao, Spain; ⁴National University of Science and Technology «MISIS», Moscow, Russia
- 15.30 *FG-2:IL04* **Effect of Stress Components on Magnetostatic and Magnetostrictive Properties of Amorphous Microwires**
V. RODIONOVA^{1,2}, K. CHICHAY¹, I. BARABAN¹, A. LITVINOVA¹, ¹STP "Fabrika" and Center for Functionalized Magnetic Materials (FunMagMa), Immanuel Kant Baltic Federal University, Kaliningrad, Russia; ²National University of Science and Technology «MISIS», Moscow, Russia

Room: **SALA STAMPA**

Session FH-1 - Design Elements and Advanced Concepts for Photofunctional Materials

Chair: Bunsho OHTANI, Japan

- 14.30 *FH-1:IL08* **Advanced Organic/Inorganic Hybrid Materials Derived from Tunable Si-based NanoBuilding Blocks**
S. DIRÉ, E. CALLONE, M. D'ARIENZO, B. DI CREDICO, R. SCOTTI, F. RIBOT, University of Trento, Dept. Industrial Engineering, Trento, Italy; University of Milano-Bicocca, Dept. Materials Science, Milano, Italy; Université Pierre et Marie Curie, CMCP, UMR7574 -UPMC / CNRS / Collège de France, Paris, France
- 15.10 *FH-1:L09* **Transient Behavior of Ni/NiO Modified Mg:SrTiO₃ in Photocatalytic Overall Water Splitting**
KAI HAN, B. MEI, G. MUL, University of Twente, Enschede, The Netherlands
- 15.40 *FH-1:L10* **Coupling Between Enzymes and a Photoactive Sulphide for Photoproduction of H₂ and O₂**
C. TAPIA, **J.C. CONESA**, A.L. DE LACEY, M. PITA, Inst. de Catálisis y Petroleoquímica, CSIC, Madrid, Spain; S. SHLEEV, Biomed. Sci., Fac. Health & Society, Malmö University, Malmö, Sweden
- 16.10 *Break*

Session FH-2 - Understanding Fundamentals of Photo-induced Processes and Charge Transport

Chair: Peter CROZIER, USA

- 16.40 *FH-2:IL03* **Enhancing Photoelectrochemical Water Splitting Performance using Hematite Anode through Doping and Morphology Control**
XIN ZHAO, **ZHONG CHEN**, School of Materials Science and Engineering, Nanyang Technological University, Singapore
- 17.20 *FH-2:IL04* **Mechanistic Aspects of Photocatalytic CO₂ Reduction**
M. DILLA, A. MATEBLOWSKI, S. RISTIG, Max-Planck-Institute for Chemical Energy Conversion, Muelheim/Ruhr, Germany; N. MOUSTAKAS, T. PEPPEL, **J. STRUNK**, Leibniz Institute for Catalysis (LIKAT), Rostock, Germany

Room: **BEVAGNA**

Session FI-1 - Materials Design and Processing

Chair: Hirohiko FUKAGAWA, Japan

- 14.30 *FI-1:IL10* **Enhanced Performance of Luminescent Powders due to Coating of Phosphor Particles by Atomic Layer Deposition in a Fluidized Bed Reactor**
H.T. HINTZEN¹, O.M. TEN KATE², Y. ZHAO^{2,3}, L.J. YIN^{2,4}, Z. ZHOU^{2,5}, J.R. VAN OMMEN², ¹Luminescent Materials, Faculty of Applied Sciences, Delft University of Technology, Delft, The Netherlands; ²Product & Process Engineering, Faculty of Applied Sciences, Delft University of Technology, Delft, The Netherlands; ³College of Materials, Xiamen University, Xiamen, China; ⁴School of Energy Science and Engineering, University of Electronic Science and Technology of China, Chengdu, China; ⁵Science College of Hunan Agricultural University, Changsha, China
- 15.10 *FI-1:IL11* **Single-phased Eu²⁺-activated Phosphors with High Color Rendering for Near-UV LED Chips**
PENG PENG DAI¹, XINTONG ZHANG¹, YICHUN LIU¹, **XIAOJUN WANG**², ¹Key Laboratory for UV Light-Emitting Materials and Technology of Ministry of Education, Northeast Normal University, Changchun, China; ²Department of Physics, Georgia Southern University, Statesboro, GA, USA
- 15.50 *FI-1:L13* **Design Strategies for Materials Showing Thermally Activated Delayed Fluorescence and Beyond - Towards the Fourth Generation OLED Mechanism**
H. YERSIN, University of Regensburg, Regensburg, Germany

TUESDAY JUNE 12 AFTERNOON

Room: **CASCIA**

Chair: Yaroslav ROMANYUK, Switzerland

Session FJ-2 - Material Design and Device Development

14.30 *FJ-2:IL01* **Amorphous Semiconductor Mobility Physics**
J.F. WAGER, School of EECS, Oregon State University, Corvallis,
OR, USA

15.10 *FJ-2:IL02* **High-throughput Development of Wide Bandgap
Conductive Sulfides**
A. ZAKUTAYEV, National Renewable Energy Laboratory, Golden,
CO, USA

15.50 *Break*

Chair: Junjun JIA, Japan

16.20 *FJ-2:L03* **Low-dimensional Multi-layer Metal Oxide
Semiconductors for Transistor Applications**
T. ANTHOPOULOS, King Abdullah University of Science and
Technology (KAUST), Division of Physical Sciences and Engineering,
Thuwal, Saudi Arabia

Session FJ-3 - Applications

16.50 *FJ-3:IL04* **Wide Band Gap ZnO Applications**
TETSUYA YAMAMOTO, Materials Design Center, Research
Institute, Kochi University of Technology, Kami-shi, Kochi, Japan

Room: **SPOLETO B**

Session FK-3 - Materials for First Wall Components of Nuclear Fusion Systems

Chair: Rudolf NEU, Germany

- 14.30 *FK-3:IL03 Tungsten Alloys for Reduced Oxidation under Accident Conditions in Fusion*
C. GARCIA-ROSALES, A. CALVO, N. ORDÁS, I. ITURRIZA, Ceit-IK4 and Tecnun (Univ. of Navarra), San Sebastian, Spain; K. SCHLÜTER, R. NEU, M. BALDEN, H. GREUNER, Max-Planck-Institut für Plasmaphysik, Garching, Germany; K. SCHLÜTER, R. NEU, Technische Univ. München, Garching, Germany; F. KLEIN, G. PINTSUK, A. LITNOVSKY, T. WEGENER, Forschungsz. Jülich GmbH, Inst. f. Energie- und Klimaforschung - Plasmaphysik, Jülich, Germany; E. TEJADO, J.Y. PASTOR, Polytechnic Univ. of Madrid, Madrid, Spain
- 15.00 *FK-3:IL04 Conclusions drawn from Plasma Operation with Beryllium and Tungsten Plasma-facing Components in JET and Linear Plasma Devices*
S. BREZINSEK¹, D. BORODIN¹, M. RUBEL², R. DOERNER³ and PFC and JET contributors, ¹Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung -Plasmaphysik, Jülich, Germany; ²Fusion Plasma Physics, Royal Institute of Technology (KTH), Stockholm, Sweden; ³Center for Energy Research, University of California at San Diego, La Jolla, CA, USA
- 15.30 *FK-3:IL05 Overview of a Comprehensive First Mirror Test in the JET Tokamak for ITER*
M. RUBEL¹, SUNWOO MOON¹, P. PETERSSON¹, A. WIDDOWSON² and JET Contributors, ¹Royal Institute of Technology (KTH), Stockholm, Sweden; ²CCFE, Culham Science Centre, Abingdon, UK
- 16.00 *FK-3:IL06 New Materials and Composites for Fusion Reactor First Wall Components*
Ch. LINSMEIER, J.W. COENEN, J. RIESCH*, M. BRAM, J. ENGELS, S. HEUER, A. HOUBEN, B. JASPER, F. KLEIN, A. LITNOVSKY, Y. MAO, G. PINTSUK, L. RAUMANN, M. RASINSKI, J. SCHMITZ, X. TAN, T. WEGENER, Forschungsz. Jülich GmbH, Inst. f. Energie- und Klimaforschung - Plasmaphysik, Partner of Trilateral Euregio Cluster, Jülich, Germany; *Max-Planck-Inst.f.Plasmaphysik, Garching, Germany
- 16.30 *Break*

Session FK-5 - Nuclear Fuel Materials

Chair: Yutai KATOH, USA

- 17.00 *FK-5:IL01 Development of MA-Zr Hydride for Transmutation of Nuclear Wastes by Fast Reactor*
KENJI KONASHI¹, M. HIRAI², H. MUTA³, K. KUROSAKI³, K. ITOH⁴, K. IKEDA⁵, M. YAMAWAKI⁶, ¹IMR, Tohoku University, Ibaraki, Japan; ²Nippon Nuclear Fuel Dev. Co. Ltd., Ibaraki-ken, Japan; ³Div. of Sustainable Energy and Env. Eng., Osaka Univ., Osaka, Japan; ⁴Nuclear Dev. Corp., Ibaraki, Japan; ⁵Mitsubishi FBR Systems, Inc., Tokyo, Japan; ⁶Research Inst. of Nucl Eng., Univ. of Fukui, Fukui, Japan
- 17.30 *FK-5:L02 Study of Dissolution Mechanisms for Mixed Actinides Oxides*
N. DACHEUX, **S. SZENKNECT**, L. CLAPAREDE, N. CLAVIER, A. MESBAH, R. PODOR, ICSM UMR 5257, France, P. MOISY, CEA Marcoule, France
- 17.50 *FK-5:L03 Impact of PGM Particles during the Dissolution of Uranium Dioxide*
L. CLAPAREDE, T. CORDARA, S. SZENKNECT, A. MESBAH, R. PODOR, N. DACHEUX, ICSM UMR5257, France, C. LAVALETTE, AREVA NC, Paris, France

Room: **VIP**

Session FK-10.2 - Challenging Waste Constituents

Chair: Celine CAU DIT COUMES, France

- 14.30 *FK-10.2:IL01* **X-Ray Diffraction and Adsorption Spectra Reveal Zr and Ti Coordination Environment in Actinides Immobilization by Glass-Ceramics**
CHANGZHONG LIAO, KAIMIN SHIH, Department of Civil Engineering, The University of Hong Kong, Hong Kong SAR, China
- 15.00 *FK-10.2:IL02* **Recovery of Actinides from Nuclear Waste Using Pyro-electrochemical Process**
WEIQUN SHI, Laboratory of Nuclear Energy Chemistry, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China
- 15.30 *FK-10.2:IL04* **Removal of Noble Metals from High Level Liquid Waste by Silica-based Anion Exchangers**
YUEZHOU WEI, X. WANG, S. NING, Guangxi University, Nanning, China; Y. WU, Q. ZOU, Shanghai Jiao Tong University, Shanghai, China

Room: **MAGIONE A**

Session FL-1 - Classes of Materials and their Synthesis and Chemical Modification

Chair: Phillip B. MESSERSMITH, USA

14.30 *FL-1:IL10* **From Melanins to OLED Devices: Designing Electroluminescent Materials Inspired to Human Pigments**

P. MANINI, C.T. PRONTERA, V. CRISCUOLO, A. PEZZELLA, O. CRESCENZI, M. PAVONE, M. D'ISCHIA, Department of Chemical Science, University of Naples Federico II, Napoli, Italy; M.G. MAGLIONE, P. TASSINI, C. MINARINI, Lab. Nanomaterials and Devices, ENEA C.R. Portici, Portici, Italy

15.10 *FL-1:IL11* **Bioinspired Self-organization of Functional Materials**

L. HELMBRECHT, H.C. HENDRIKSE, A. VAN DER WEIJDEN, **W.L. NOORDUIN**, AMOLF, Amsterdam, The Netherlands

15.50 *Break*

Session FL-2 - Electronic Devices with Biological and Bio-inspired Materials

Chair: Paola MANINI, Italy

16.20 *FL-2:IL01* **Self-organized and Self-assembled Organic Bioelectronics for Applications in Medicine and Plant Biology**

M. BERGGREN, Laboratory of Organic Electronics, Linköping University, Norrköping, Sweden

17.00 *FL-2:IL02* **Electronic Interface with Plants**

E. STAVRINIDOU, Linköping University, Norrköping, Sweden

Room: **ORVIETO A**

Session FM-3 - Emerging Applications for Non-volatile Memories

Chair: Michael KOZICKI, USA

- 14.30 *FM-3:IL17* **Computational Memory: The First Step Towards Non-von Neumann Computing?**
A. SEBASTIAN, IBM Research - Zurich, Rueschlikon, Switzerland
- 15.00 *FM-3:IL19* **Dynamics of HfO₂-based Resistive Memory for Neuromorphic Computation**
S. BRIVIO, J. FRASCAROLI, E. COVI, S. SPIGA, Laboratorio MDM, IMM-CNR, Agrate Brianza, Italy
- 15.30 *Break*

Session FM-2 - Resistance Switching (RRAM) and Phase Change (PCM) Memories

Chair: Yusuf LEBLEBICI, Switzerland

- 16.00 *FM-2:IL01* **Simplified Resistive Memory for CMOS Integration**
M.N. KOZICKI, School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, USA
- 16.30 *FM-2:L02* **Impact of the Transistor Current Control on the Multiple Resistive Switching Properties in 1T1R RRAM Devices**
E. PEREZ, M.K. MAHADEVAIAH, Ch. WENGER, IHP, Frankfurt (Oder), Germany; C. ZAMBELLI, P. OLIVO, Università degli Studi di Ferrara, Ferrara, Italy
- 16.50 *FM-2:L03* **Atomic Layer Deposition of Oxygen Deficient TaOx Dielectrics for Resistive Switching Memory Applications**
A.M. MARKEEV¹, K.V. EGOROV¹, **D.S. KUZMICHEV**¹, D.I. MYKOTA¹, V.A. GRITSENKO², T.V. PEREVALOV², C.S. HWANG^{1,3}, ¹Moscow Institute of Physics and Technology, Dolgoprudny, Moscow region, Russia; ²Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia; ³Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, Seoul, South Korea
- 17.10 *FM-2:L04* **Tuning the Switching Properties of ZnO Thin Film Memristors by Al Doping via ALD**
C. GIOVINAZZO, C. RICCIARDI, S. PORRO, Politecnico di Torino, Department of Applied Science and Technology, Torino, Italy

Room: **ORVIETO B**

Session FN-2 - Structural Characterization

Chair: Vasily T. LEBEDEV, Russia

- 14.30 *FN-2:IL02* **Vibrational Spectroscopy Characterization of Nanographenes and Polyynes**
M. TOMMASINI, Dipartimento di Chimica, Materiali e Ingegneria Chimica, Politecnico di Milano, Milano, Italy
- 15.00 *FN-2:IL03* **Advanced Electron Microscopy Techniques applied to Carbon Nanomaterials and Composites**
O. ERSEN, G. MELINTE, Institut de Physique et Chimie des Matériaux de Strasbourg (IPCMS), UMR 7504 CNRS - Université de Strasbourg, Strasbourg Cedex, France

15.30 *Break*

Session FN-4 - Applications

Chair: Etienne GHEERAERT, France

- 16.00 *FN-4:IL01* **BDD Multi-electrode e-tongue for Analytical Detection in Complex Media**
B. ZRIBI, D. KAMOUNI BELGHITI, E. SCORSONE, **P. BERGONZO**, CEA-LIST, Diamond Sensors Laboratory, Gif-sur-Yvette, France
- 16.30 *FN-4:IL02* **Synthesis, Properties and Applications of Carbon Nanodots**
M. PRATO, University of Trieste, Trieste, Italy
- 17.00 *FN-4:IL03* **Nanocarbons and Carbon Nanotubes -Safe Innovation and Promise for the Future-**
MORINOBU ENDO, Shinshu University, Nagano, Japan
- 17.30 *FN-4:L04* **Understanding the Kinetics of Heavy Metals on Epitaxial Graphene: Towards Monitoring the Water Quality**
I. SHTEPLIUK, M. VAGIN, I. IVANOV, T. IAKIMOV, R. YAKIMOVA, Department of Physics, Chemistry and Biology, Linköping University, Linköping, Sweden
- 17.50 *FN-4:L11* **Graphene-based Materials for the Fast Adsorption of Biomolecules**
M. SEREDYCH¹, F. MENG¹, L. MIKHALOVSKA², S. MIKHALOVSKY², V. MOCHALIN³, **Y. GOGOTSI**¹, ¹Department of Materials Science & Engineering and A.J. Drexel Nanomaterials Institute, Drexel University, Philadelphia, PA, USA; ²Department of Chemistry, Missouri University of Science & Technology, Rolla, MO, USA; ³School of Pharmacy and Biomolecular Sciences, University of Brighton, Lewes Road, Brighton, UK

Room: MONTEFALCO

Session FO-2 - New Superconductors of the Pnictides and Related Families

Chair: Xingjiang ZHOU, China

- 14.30 *FO-2:IL04* **Irradiation-induced Decoupling between Critical Temperature and Energy Gaps in P-doped Ba-122 Films**
D. DAGHERO, M. TORTELLO, L. GOZZELINO, R.S. GONNELLI, Dipartimento di Scienza Applicata e Tecnologia, Politecnico di Torino, Torino, Italy; T. HATANO, T. KAWAGUCHI, H. IKUTA, Department of Crystalline Materials Science, Nagoya University, Nagoya, Japan
- 15.00 *FO-2:IL05* **Electronic and Magnetic Structures of H-doped 1111-type High T_c Superconductors**
SOSHI IIMURA, HIDEO HOSONO, Tokyo Institute of Technology, Yokohama, Japan
- 15.30 *Break*

Session FO-3 - Properties of Superconductors

Chair: John WEI, Canada

- 16.00 *FO-3:L06* **Comprehensive Phase Diagram of Two-dimensional Space Charge Doped Bi₂Sr₂CaCu₂O_{8+x}**
E. STERPETTI¹, J. BISCARAS¹, A. ERB², A. SHUKLA¹, ¹Institut de Minéralogie, de Physique des Matériaux et de Cosmochimie, Sorbonne Université Paris 06, UMR CNRS 7590, MNHN, IRD UMR 206, Paris, France; ²Walther Meissner Institut für Tieftemperaturforschung, Bayerische Akademie der Wissenschaften, Garching Germany
- 16.20 *FO-3:L07* **Effects of Dy₂O₃ doping on the Anisotropy and Transport of MgB₂ Wires**
M.D. SUMPTION, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH, USA
- 16.40 *FO-3:L08* **Properties and Structure of MgB₂-based Superconductors**
T. PRIKHNA¹, V. ROMAČKA², M. EISTERER³, A. KOZYREV¹, A. SHAPOVALOV¹, A. SHATERNIK¹, ¹V. Bakul Institute for Superhard Materials of the National Academy of Sciences of Ukraine (NASU), Kiev, Ukraine; ²Lviv Polytechnic National University, Lviv, Ukraine; ³Atominstytut, TU Wien, Vienna, Austria

TUESDAY JUNE 12 AFTERNOON

Room: **MAGIONE B**

Session FP-1 - Advances in Biomaterials

Chair: Tsutomu FURUZONO, Japan

- 14.30 *FP-1:IL12* **Calcium Phosphate Surfaces and Bone Regeneration**
C. STAEHLI, M. BOHNER, RMS Foundation, Bettlach, Switzerland
- 15.00 *FP-1:IL13* **Programmable Biomaterials for Mechanobiology**
J.H. HENDERSON, Syracuse Biomaterials Institute, Syracuse University, Syracuse, NY, USA
- 15.30 *FP-1:L14* **Fabrication and Evaluation of Beta-tricalcium Phosphate Granules Cement**
KUNIO ISHIKAWA, Dept. of Biomaterials, Faculty of Dental Science, Kyushu University, Fukuoka, Japan
- 15.50 *FP-1:L16* **Synthesis and Characterization of Copper Oxide Based Polymeric Nano-systems for Biomedical Imaging**
I.S. WEITZ¹, O. PERLMAN², S.S. SIVAN¹, H. AZHARI², ¹Department of Biotechnology Engineering, ORT Braude College, Karmiel, Israel; ²Department of Biomedical Engineering, Technion-Israel Institute of Technology, Technion City, Haifa, Israel
- 16.10 *Break*

Session FP-3 - New Therapeutics and Intelligent Drug/ Biomolecule/Gene Delivery Systems

Chair: Vladimir TORCHILIN, USA

- 16.40 *FP-3:IL01* **Rational Design of Polyrotaxanes as a Therapeutic Agent to Metabolic Diseases**
ATSUSHI TAMURA, NOBUHIKO YUI, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
- 17.10 *FP-3:IL02* **Novel Multifunctional Drug and Gene Delivery Systems based on Supramolecular Self-assembled Macromolecules**
JUN LI, Department of Biomedical Engineering, National University of Singapore, Singapore

Room: **CORCIANO**

Session FA-2 - Device Physics, Mechanics and Design

Chair: Darren LIPOMI, USA

- 9.30 *FA-2:IL04* **A Highly Sensitive Flexible Sensor Analog to Human Skin Via Air-assembled Motile Electronic Whiskers**
J. REEDER, T. KANG, S. RAINS, W. VOIT, University of Texas at Dallas, Richardson, TX, USA
- 10.10 *FA-2:IL05* **Soft Platinum-silicone Coating for the Epidural Stimulation of the Spinal Cord**
G. SCHIAVONE, S.P. LACOUR, LSBI, EPFL Campus Biotech, Laboratory for Soft Bioelectronic Interfaces, School of Engineering, Geneva, Switzerland
- 10.50 *Break*

Session FA-1 - Materials and Fabrication Processes

Chair: Mario CAIRONI, Italy

- 11.20 *FA-1:IL08* **Semiconducting: Insulating Polymer Blends: Towards Flexible, Robust Organic Optoelectronic Devices**
N. STINGELIN, Georgia Institute of Technology, Atlanta, GA, USA
- 12.00 *FA-1:L09* **Designing Novel Polymer Systems with Enhanced Dielectric Response**
V. BOBNAR, Condensed Matter Physics Department, Jozef Stefan Institute, Ljubljana, Slovenia; Y. BEERAN, S. THOMAS, Mahatma Gandhi University, International University Centre for Nanoscience and Nanotechnology, Kottayam, Kerala, India; Y. GROHENS, Universite de Bretagne, Sud LIMATB Laboratory, Lorient, France; V. KOKOL, University of Maribor, Institute for Engineering Materials and Design, Maribor, Slovenia; Y. THAKUR, Q. ZHANG, Electrical Engineering Department and Materials Research Institute, The Pennsylvania State University, University Park, PA, USA

Focused Session FB-6
PEROVSKITE PHOTOVOLTAICS

Room: **ASSISI A**

Chair: Tsutomu MIYASAKA, Japan (*Convener*)

9.25 *Welcome*

Session FB-6.1 - Material Synthesis and Processing

- 9.30 *FB-6.1:IL01* **Efficient Sulfur-based Hole Transporting Materials for Perovskite Solar Cells**
N. MARTIN, Depto de Química Orgánica, Facultad de Química, Universidad Complutense, Madrid, Spain; IMDEA-Nanoscience, Madrid, Spain
- 10.00 *FB-6.1:L04* **Understanding the Effect of Precursor Solution Aging in Triple-cation Lead Perovskite**
P. BOONMONGKOLRAS, DAEHAN KIM, **BYUNGHA SHIN**, Dept. of Materials Science and Eng., Korea Advanced Institute of Science and Technology, Daejeon, South Korea
- 10.20 *FB-6.1:IL03* **Molecular Engineering of Hole-transporting Materials for Perovskite Solar Cells**
A. MOLINA-ONTORIA¹, I. ZIMMERMANN², J. URIETA³, J. ARAGO⁴, E. ORTI⁴, M.K. NAZEERUDDIN², N. MARTÍN^{1,3}, ¹IMDEA-Nanoscience, Campus de Cantoblanco, Madrid, Spain; ²Ecole Polytechnique Fédérale de Lausanne, Sion, Switzerland; ³Dept. of Organic Chemistry, Faculty of Chemistry, University Complutense, Madrid, Spain; ⁴Instituto de Ciencia Molecular, Universidad de Valencia, Paterna, Spain
- 10.50 *Break*

Session FB-6.3 - Material and Device Stability

Chair: Agustin MOLINA ONTORIA, Spain

- 11.20 *FB-6.3:IL01* **Novel Materials for Stable Perovskite Solar Cells**
A. ABATE, Helmholtz-Zentrum Berlin, Berlin, Germany
- 11.50 *FB-6.3:L02* **How to Assess Operational Stability of Perovskite Solar Cells with Reversible Degradation?**
M.V. KHENKIN¹, K.M. ANOOP¹, I. VISOLY-FISHER^{1,2}, Y. GALAGAN³, F. DI GIACOMO³, B. RAMESH PATIL⁴, G. SHERAFATIPOUR⁴, V. TURKOVIC⁴, M. MADSEN⁴, T. MERCKX⁵, G. UYTTERHOEVEN⁵, J.P. A. BASTOS^{5,6}, T. AERNOUTS⁵, F. BRUNETTI⁷, M. LIRA-CANTU⁸, **E.A. KATZ**^{1,2}, ¹Dept. of Solar Energy and Environmental Physics, Swiss Inst. for Dryland Environmental and Energy Research, J. Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Midreshet Ben-Gurion, Israel; ²Ilse Katz Inst. for Nanoscale Science and Technology, Ben-Gurion University of the Negev, Beersheva, Israel; ³Holst Centre - Solliance, Eindhoven, Netherlands; ⁴SDU NanoSYD, Mads Clausen Inst., University of Southern Denmark, Sønderborg, Denmark; ⁵IMEC-a partner in Solliance, Leuven, Belgium; ⁶Dept. Electrical Eng., KU Leuven, Leuven, Belgium; ⁷CHOSE (Centre for Hybrid and Organic Solar Energy), Dept. of Electronic Eng., University of Rome Tor Vergata, Rome, Italy; ⁸Catalan Inst. of Nanoscience and Nanotechnology (ICN2), CSIC and The Barcelona Inst. of Sci. and Tech., Campus UAB, Bellaterra, Barcelona, Spain

Room: **ASSISI B**

Session FC-2 - Hydrogen Storage

Chair: Yaroslav FILINCHUK, Belgium

- 9.30 *FC-2.2:IL02* **Stability of Complex Hydrides**
HEENA YANG, A. ZUETTEL, LMER, ISIC, SB, École polytechnique fédérale de Lausanne (EPFL) Valais/Wallis, Energypolis, Sion, Switzerland; Empa Materials Science and Technology, Dübendorf, Switzerland
- 10.00 *FC-2.2:L03* **Mesoporous Carbons for the Nano-confinement of Hydrogen Storage Materials**
R. JANOT, Laboratoire de Réactivité et Chimie des Solides (LRCS), UMR 7314 CNRS, Amiens, France
- 10.20 *FC-2.2:L04* **Mg(BH₄)₂ : Synthesis, Nano-confinement and Catalysis**
D. CLEMENÇON, J-N. CHOTARD, R. JANOT, Laboratoire de Réactivité et Chimie des Solides (LRCS), UMR 7314 CNRS, Université de Picardie Jules Verne, Amiens, France
- 10.40 *FC-2.2:L05* **Thermodynamic Stability of Multi-cation Complex Hydrides**
E.M. DEMATTEIS, M.G. POLETTI, M. BARICCO, University of Turin & NIS, Torino, Italy; A. SANTORU, C. PISTIDDA, M. DORNHEIM, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany
- 11.00 *Break*

Chair: Luca PASQUINI, Italy

- 11.30 *FC-2.3:IL01* **Borohydride-water Based Chemical Hydrogen Carriers for On-board Hydrogen Storage**
U.B. DEMIRCI, University of Montpellier IEM, UMR5635, CNRS-ENSCM-UM, Montpellier, France
- 12.00 *FC-2.3:IL03* **Chemical Hydrides as Precursors for the Growth of 2D Materials**
F. LEARDINI, Departamento de Física de Materiales, Universidad Autónoma de Madrid, Madrid, Spain

Room: **NORCIA**

Session FD-1 - Batteries

Chair: Duncan GREGORY, UK

9.00 *FD-1:IL16* **New Developments in Three-dimensional Microbatteries**

E. COHEN¹, S. MENKIN¹, H. RAGONES¹, M. LIFSHITS¹, Y. KAMIR², G. KOSA², **D. GOLODNITSKY**¹, ¹School of Chemistry, Tel Aviv University, Tel Aviv, Israel; ²Department of Biomedical Engineering, University of Basel, Switzerland

9.40 *FD-1:IL17* **Liquid and Solid State NMR Investigations of Low MW Polyether and Non-polyether Polymer Electrolytes for Supercapacitor and Battery Applications**

M. GOBET, JING PENG, S. MUNOZ, D. MORALES, **S.G. GREENBAUM**, Hunter College of CUNY, New York, NY, USA; L. CARBONE, J. HASSOUN, University of Ferrara, Ferrara, Italy; R. RUTHER, J. NANDA, Oak Ridge National Laboratory, Oak Ridge, TN, USA; M. ZIMMERMAN, R. LEISING, Ionic Materials, Inc. Woburn, MA, USA

10.20 *FD-1:L18* **Polymeric Electrode Materials for Organic Batteries**

A. LEX-BALDUCCI, S. MÜNCH, C. FRIEBE, R. BURGESS, M.D. HAGER, U.S. SCHUBERT, Laboratory of Organic and Macromolecular Chemistry (IOMC), Friedrich Schiller University Jena, Jena, Germany; Center for Energy and Environmental Chemistry Jena (CEEC Jena), Friedrich Schiller University Jena, Jena, Germany

10.50 *Break*

Chair: Shigeto OKADA, Japan

11.20 *FD-1:IL19* **Challenging the Fabrication of Ultra-thick Electrodes for Higher Energy Density Batteries**

L. ZOLIN, W. PORCHER, CEA Grenoble - Liten, Grenoble, France; J. GAUBICHER, D. GUYOMARD, **B. LESTRIEZ**, IMN CNRS/ University of Nantes, Nantes, France

12.00 *FD-1:IL20* **Ions, Electrons, and Phonons: On the Movement of Charge through Solids**

B.C. MELOT, Department of Chemistry, University of Southern California, Los Angeles, CA, USA

Room: **SPELLO**

Session FE-2 - Proton-conducting (PEFCs) and Alkaline (AFCs) Polymer Electrolyte Fuel Cells

Chair: Dario R. DEKEL, Israel

- 9.00 *FE-2:IL04* **Nano-structured Hydrogen Oxidation Electrocatalysts for Anion Exchange Membrane Fuel Cells**
H.A. MILLER, A. LAVACCHI, F. VIZZA, M. BELLINI, M. FOLLIERO, M. PAGLIARO, J. FILPI, A. MARCHIONNI, M. MARELLI, F. DI BENEDETTO, F. D'ACAPITO, D.R. DEKEL, CNR-ICCOM, Sesto Fiorentino, Italy
- 9.40 *FE-2:IL05* **Proton Conductivity in Intermediate Temperature Electrolyte Membranes - New Insights and Perspectives**
QINGFENG LI, D. AILI, H. BECKER, L.N. CLEEMANN, J.O. JENSEN, Section of Proton Conductors, Department of Energy Conversion and Storage, Technical University of Denmark, Lyngby, Denmark
- 10.20 *FE-2:IL06* **State-of-the-art polymer Electrolyte Fuel Cells (PEFC): The Remaining Research Challenges**
K.A. FRIEDRICH, P. GAZDZICKI, J. MITZEL, M. SCHULZE, German Aerospace Center (DLR), Institute of Engineering Thermodynamics, Stuttgart, Germany; R. HIESGEN, University of Applied Sciences Esslingen, Department of Basic Science, Esslingen, Germany

11.00 *Break*

Chair: Qing Feng LI, Denmark

- 11.30 *FE-2:IL07* **Ti-based Perovskite Materials as Co-catalysts and Membrane Additives in Proton-conducting Polymer Electrolyte Fuel Cells**
M.A. NAVARRA, L. MAZZAPIODA, S. PANERO, Department of Chemistry, Sapienza University of Rome, Rome, Italy
- 12.10 *FE-2:IL08* **Cobalt Platinum Bronze as a Catalyst for Polymer Electrolyte Fuel Cells**
YUJI KAMITAKA, **YU MORIMOTO**, Toyota Central R&D Labs., Inc., Nagakute, Aichi, Japan

Room: SALA RELATORI

Session FF-3 - Devices Technologies and Applications for Thermoelectrics, Thermionics, and Thermophotovoltaics

Chair: Woochul KIM, South Korea

- 9.30 *FF-3:IL01* **Next Generation Thermionic Energy Conversion for Space Application**
V.I. KUZNETSOV, Ioffe Institute, St. Petersburg, Russia
- 10.10 *FF-3:L03* **STEALS a Modular Direct Conversion Thermal System with Integrated Storage**
D. GINLEY¹, P. PARILLA¹, J. ALLEMAN¹, J. VIDAL¹, G. GLATZMAIER¹, A. ZAKUTAYEV¹, J. REA², C. OSHMAN², A. SINGH², N. SIEGEL³, J. SHARP⁴, M. WHITE⁵, P. BREHM⁶, S. DRANEY⁵, G. BUCHHOLZ⁵, E. TOBERER², ¹NREL, Golden, CO, USA; ²CSM, Golden, CO, USA; ³Bucknell University; ⁴Marlow, ⁵Infinia Tech Corp.
- 10.40 *FF-3:L04* **Radioisotope Thermoelectric Generators for the European Space Nuclear Power Programme**
R. AMBROSI¹, H. WILLIAMS¹, E.J. WATKINSON¹, A. BARCO¹, R. MESALAM¹, M. REECE², KAN CHEN², K. SIMPSON³, M. ROBBINS³, R. TULEY³, C. BURGESS⁴, M.-C. PERKINSON⁴, A. WALTON⁴, C. STROUD⁵, A. GODFREY⁵, S. GIBSON⁵, K. STEPHENSON⁶, T. CRAWFORD¹, C. BICKNELL¹, J. SYKES¹, M. SARFIELD⁷, T. TINSLEY⁷, C. FONGARLAND⁸, D. KRAMER⁹, ¹University of Leicester, Leicester, UK; ²Queen Mary University of London, London, UK; ³European Thermodynamics, Kibworth, Leicester, UK; ⁴Airbus Defence and Space, Stevenage, UK; ⁵Lockheed Martin, Amptill, UK; ⁶European Space Agency, ESTEC, Netherlands; ⁷National Nuclear Lab., Sellafield, UK; ⁸Ariane Group, Paris, France; ⁹University of Dayton Research Institute, Dayton, OH, USA
- 11.10 *Break*

Session FF-2 - Novel Materials for High Efficiency Thermal-to-electrical Energy Conversion

Chair: Ernst BAUER, Austria

- 11.40 *FF-2:IL03* **High Electron Mobility and Stability of n-type Mg₃(Sb,Bi)₂**
TSUTOMU KANNO, H. TAMAKI, H.K. SATO, Panasonic Corporation, Seika, Kyoto, Japan; Y. MIYAZAKI, Tohoku University, Sendai, Miyagi, Japan
- 12.20 *FF-2:IL08* **Development of Thermoelectric Borides toward Topping Cycles**
TAKAO MORI, National Institute for Materials Science (NIMS), Tsukuba, Japan

Room: **SPOLETO A**

Session FG-2 - Soft Magnetic Materials

Chair: Cristina GOMEZ-POLO, Spain

- 9.30 *FG-2:IL05* **Magnetic Properties of Electrocatalytically Active 3D Nanoporous Fe-containing Metallic Films Prepared by Micelle-assisted Electrodeposition**
E. PELLICER¹, E. ISARAIN-CHÁVEZ¹, M.D. BARÓ¹, J. SORT^{1,2},
¹Departament de Física, Universitat Autònoma de Barcelona, Bellaterra, Spain; ²Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain
- 10.00 *FG-2:L06* **Multi-parameter Search of Optimal Properties of Soft Magnetic Microwires**
A. CHIZHIK¹, J. GONZALEZ¹, A. ZHUKOV^{1,2}, A. STUPAKIEWICZ³,
¹Universidad del País Vasco, UPV/EHU, San Sebastián, Spain; ²IKERBASQUE, Basque Foundation for Science, Bilbao, Spain; ³Laboratory of Magnetism, University of Białystok, Białystok, Poland
- 10.20 *FG-2:IL07* **Soft Magnetic Ferrites for Biomedical Applications**
P. TIBERTO, G. BARRERA, F. CELEGATO, M. COISSON,
Nanoscience and Materials Division, INRIM, Torino, Italy
- 10.50 *Break*

Chair: Paola TIBERTO, Italy

- 11.20 *FG-2:IL08* **Magnetite Nanoparticles Biosynthesized by Magnetotactic Bacteria for Biomedical Application**
M.L. FERNANDEZ-GUBIEDA, Departamento de Electricidad y Electrónica, Universidad del País Vasco UPV/EHU, Leioa, Spain

Session FG-3 - Magnetocaloric and Multifunctional Magnetic Materials

- 11.50 *FG-3:IL02* **Thermodynamics of Multicaloric Materials**
T. CASTAN, LL. MAÑOSA, A. PLANES, Departament de Física de la Matèria Condensada, Facultat de Física, Universitat de Barcelona, Spain; A. SAXENA, Los Alamos National Laboratory, NM, USA; E. STERN, Department of Material Sciences, University of Cambridge, UK

Room: **SALA STAMPA**

Session FH-2 - Understanding Fundamentals of Photo-induced Processes and Charge Transport

Chair: Detlef BAHNEMANN, Germany

- 9.30 *FH-2:IL05* **Recent Advances in the Search of Effective Materials for Photo-electrochemical Water Splitting**
J. AUGUSTYNSKI, Centre for New Technologies, University of Warsaw, Warsaw, Poland
- 10.10 *FH-2:L06* **Conduction Band Engineering in TiO₂ and SnO₂: Photocatalysis, Solar Fuel and Solar Cells**
L. KAVAN, J. Heyrovsky Institute of Physical Chemistry, Prague, Czech Republic

10.40 *Break*

Session FH-3 - Design Approaches for Advanced Applications

Chair: Ladislav KAVAN, Czech Republic

- 11.10 *FH-3:IL01* **Design Rules for Photoactive Materials for Photo Electrochemical Solar Energy Conversion**
W. JAEGERMANN, Surface Science Division, TU Darmstadt Materials Science, Darmstadt Germany
- 11.50 *FH-3:IL02* **Strategies for Stable Water Splitting via Protected Photoelectrodes**
I. CHORKENDORFF, SurfCat, Department of Physics, The Technical University of Denmark, Kongens Lyngby, Denmark

Room: **BEVAGNA**

Session FI-2 - Optoelectronic and Photonic Processes

Chair: Yasushi NANISHI, Japan

- 9.00 *FI-2:IL01* **Metal Halide Perovskites Light Emitting Devices and Interface Stability**
B.P. RAND, Department of Electrical Engineering and Andlinger Center for Energy and the Environment, Princeton University, Princeton, NJ, USA
- 9.40 *FI-2:IL02* **Realization of High Performance UV Emitters by using AlGaIn Materials**
MOTOAKI IWAYA¹, TETSUYA TAKEUCHI¹, SATOSHI KAMIYAMA¹, ISAMU AKASAKI^{1,2}, ¹Faculty of Science and Technology, Meijo University, Japan; ²Akasaki Research Center, Nagoya University, Japan
- 10.20 *FI-2:IL03* **Deep UV LEDs**
M.P. HOFFMANN, C. BRANDL, M. TOLLABI-MAZRAEHNO, M. JAMA, N. TILLNER, M.J. DAVIES, C. FRANKERL, G. ROSSBACH, S. ALARCON VILLASECA, **H.-J. LUGAUER**, OSRAM Opto Semiconductors GmbH, Regensburg, Germany
- 11.00 *Break*

Chair: Barry RAND, USA

- 11.30 *FI-2:IL04* **Indirect Excitons in Group III-Nitride-Based Quantum Wells**
P. LEFEBVRE, B. JOUAULT, T. GUILLET, C. BRIMONT, P. VALVIN, T. BRETAGNON, M. VLADIMIROVA, Laboratoire Charles Coulomb (L2C), CNRS, University of Montpellier, France; L. LAHOURECADE, N. GRANDJEAN, Institute of Condensed Matter Physics, EPFL, Lausanne, Switzerland; B. DAMILANO, CRHEA-CNRS, Valbonne, France
- 12.10 *FI-2:L05* **Enhancing the Electroluminescence of Organic Light-emitting Transistors by Modifying the Metal/Organic Interface with Conjugated Polar Polymers**
M. PROSA¹, E. BENVENUTI¹, M.C. PASINI², F. GALEOTTI², U. GIOVANELLA², M. MUCCINI¹, S. TOFFANIN¹, ¹ISMN - CNR, Bologna, Italy; ²ISMAL - CNR, Milano, Italy

Room: **CASCIA**

Session FJ-2 - Material Design and Device Development

Chair: Demosthenes KOUTSOGEORGIS, UK

- 9.00 *FJ-2:IL06* **Investigating the Effects of Nanostructured Dielectric Lithium Fluoride and Plasmonic Gold Interlayers in Organic Photovoltaics**
H. KURT, Istanbul Medipol University, Istanbul, Turkey; **CLEVA W. OW-YANG**, Sabanci University, Istanbul, Turkey
- 9.40 *FJ-2:IL07* **Alternative Transparent Conductors for Flexible CIGS Thin Film Solar Cells**
Y.E. ROMANYUK, L. GREUTER, T. FEURER, R. CARRON, S. NISHIWAKI, S. BUECHELER, A.N. TIWARI, Empa - Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland
- 10.20 *FJ-2:IL08* **Flexible, Transparent and Conductive Ag Nanowire Networks**
D. BELLET¹, T. SANNICOLO^{1,2}, S. AGHAZADEHCHORS^{1,3}, T. PAPANASTASIOU¹, H. VIET-NGUYEN^{1,4}, D. MUÑOZ-ROJAS¹, C. JIMÉNEZ¹, N.D. NGUYEN³, ¹Univ. Grenoble Alpes, LMGP, CNRS, Grenoble, France; ²Univ. Grenoble Alpes, CEA LITEN, Grenoble, France; ³Univ. of Liège, Département de Physique, Liège, Belgium; ⁴CEA-INES, LITEN, Le Bourget-du-Lac, France
- 11.00 *Break*
- Chair: Daniel BELLET, France
- 11.20 *FJ-2:IL09* **Computational Approach to Synthesis of Functional Polymorphs**
D. GINLEY¹, A. ZAKUTAYEV¹, K. PERSSON², L. GARTEN¹, P. SELVARASU¹, J. PERKINS¹, WENHAO SUN², K. POPOV², S. DWARAKNATH², G. CEDER², J. MANGUM³, B. GORMAN³, L. SCHELHAS⁴, M. TONEY⁴, M. AYKOL², Z. CHAN⁵, D. NOCERA⁵, J. HAGGERTY⁶, O. AGIRSEVEN⁶, J. TATE⁶, D. KITCHAEV⁷, W. TUMAS¹, ¹National Renewable Energy Laboratory, Golden, CO, USA; ²Lawrence Berkeley National Laboratory, USA; ³Colorado School of Mines, USA; ⁴SLAC National Accelerator Laboratory, USA; ⁵Harvard University, USA; ⁶Oregon State University; ⁷Massachusetts Institute of Technology, USA
- 12.00 *FJ-2:IL10* **Graphene Films as Transparent Electrodes**
D. NEUMAIER, AMO GmbH, Aachen, Germany
- 12.40 *FJ-2:L11* **Response to Mechanical Bending Stress of AZO/Ag/AZO Thin Films**
G. TORRISI^{1,2}, I. CRUPI³, S. MIRABELLA^{1,2}, A. TERRASI^{1,2}, ¹University of Catania, Italy; ²CNR-IMM, Catania, Italy; ³University of Palermo, Italy

Room: **SPOLETO B**

Session FK-5 - Nuclear Fuel Materials

Chair: Kenji KONASHI, Japan

- 9.30 *FK-5:IL04* **Response of Commercial MAX-phases to Neutron Irradiation to Intermediate Fluences**
YUTAI KATOH^{1,2}, CAEN ANG², P. EDMONDSON¹, TAKAAKI KOYANAGI¹, ¹Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA; ²University of Tennessee, Knoxville, TN, USA
- 10.00 *FK-5:L06* **High Temperature X-Ray Diffraction Studies of Surrogates for Americium Oxides**
E.J. WATKINSON, R.M. AMBROSI, J. NAJORKA, Department of Physics and Astronomy, University of Leicester, Leicester, UK; Natural History Museum, London, UK
- 10.20 *FK-5:L07* **Conversion of Surrogate and Uranium Oxide by Solution Combustion Synthesis**
J. MONNIER¹, X. DESCHANELS¹, C. REY¹, E. WELCOMME², ¹CEA Marcoule - Institut de Chimie Séparative de Marcoule (ICSM) - LNER, Bagnols sur Cèze, France; ²CEA Marcoule - ATALANTE - DMRC, France
- 10.40 *Break*

Chair: Viacheslav M. CHERNOV, Russia

- 11.10 *FK-5:L09* **Dissolution of Uranium Thorium Mixed Oxides: The Role of Nitrous Acid**
T. DALGER, S. SZENKNECT, L. CLAPAREDE, N. DACHEUX, Institut de Chimie Séparative de Marcoule, ICSM UMR 5257, CNRS, CEA, Univ. Montpellier, ENSCM, Bagnols sur Cèze cedex, France; P. MOISY, CEA, Nuclear Energy Division, Research Department of Mining and Fuel Recycling Processes, Bagnols-sur-Cèze, France
- 11.30 *FK-5:L10* **Zirconium Carbide (ZrC) for High Temperature Nuclear Environments - Probing the Local Structure using NMR**
DHAN-SHAM RANA, I. FARNAN, Department of Earth Sciences, University of Cambridge, Cambridge, UK

Room: **VIP**

Session FK-10.3 - Waste Form Performance Testing, and Characterization

Chair: Sophie SCHULLER, France

10.30 *FK-10.3:IL01* **Modern Irradiation Testing Techniques to Simulate the Irradiation Performance of Waste Forms**

S. PEUGET¹, A.H. MIR¹, S. MIRO², Y. SERRUYS², I. MONNET³, C. JEGOU¹, ¹CEA, DEN, DE2D, SEVT, LMPA, Laboratoire d'Étude des Matériaux et Procédés Actif, Bagnols-sur-Cèze, France; ²CIMAP-GANIL (CEA-CNRS-ENSICAEN-Univ. Caen), Caen Cedex, France; ³CEA, DEN, Service de Recherches de Métallurgie Physique, Laboratoire JANNUS, Gif-sur-Yvette, France

11.00 *FK-10.3:IL02* **Impact of Near Field Evolution on the Stability of Vitrified Waste and Spent Nuclear Fuel**

K. LEMMENS, C. CACHOIR, K. FERRAND, T. MENNECART, S. CAES, E. VALCKE, Belgian Nuclear Research Centre, Mol, Belgium

11.30 *Break*

Chair: Kevin FOX, USA

12.00 *FK-10.3:IL03* **Synchrotron-based Three-dimensional X-ray Imaging of Crystalline Ceramic Waste Form Materials**

WILSON K.S. CHIU, Department of Mechanical Engineering, University of Connecticut, Storrs, CT, USA

Session FK-10.4 - Waste Immobilization Facilities and Repository Design

12.30 *FK-10.4:IL01* **International Experience in Radioactive Waste Vitrification**

M.I. OJOVAN, R.A. ROBBINS, International Atomic Energy Agency (IAEA), Vienna, Austria

Room: **MAGIONE A**

Session FL-3 - Photonic Devices with Biological and Bio-inspired Materials

Chair: Matjaz HUMAR, Slovenia

- 9.30 *FL-3:IL01* **Photonic Crystals Composed of 99% Water and 1% Inorganic Nanosheet**
YASUHIRO ISHIDA, RIKEN Center for Emergent Matter Science, Japan
- 10.10 *FL-3:IL02* **Biologically Inspired Soft and Fluid Optical Materials**
M. KOLLE, S. NAGELBERG, J. SANDT, Massachusetts Institute of Technology, Cambridge, MA, USA
- 10.50 *Break*
- 11.20 *FL-3:IL04* **Fluorescent Proteins and Carbon Nanotubes: Unconventional Materials for Strong Light-matter Interaction and Solid-state Lasers**
C. DIETRICH^{1,2}, A. GRAF^{1,3}, L. TROPF¹, M. KARL¹, A. KÄMPF¹, M. SCHUBERT¹, N.M. KRONENBERG¹, Y. ZAKHARKO³, S. HÖFLING^{1,2}, J. ZAUMSEIL³, **M.C. GATHER**¹, ¹School of Physics and Astronomy, University of St Andrews, St Andrews, UK; ²Technische Physik, Universität Würzburg, Würzburg, Germany; ³Institute for Physical Chemistry, Universität Heidelberg, Heidelberg, Germany

Room: **ORVIETO A**

Session FM-2 - Resistance Switching (RRAM) and Phase Change (PCM) Memories

Chair: Hugh BARNABY, USA

- 9.00 *FM-2:IL10* **Mechanisms and Nanoscale Processes in Resistive Switching Memories**
I. VALOV, Research Centre Juelich, Electronic Materials (PGI-7), Juelich, Germany
- 9.30 *FM-2:L11* **MIS Structures with Interfacial Graphene for RRAM Applications: A Nanoscale and Device Level Characterization**
S. CLARAMUNT, QIAN WU, M. PORTI, M. NAFRIA, X. AYMERICH, Electronic Eng. Dept., Univ. Autònoma de Barcelona, Bellaterra, Spain
- 9.50 *FM-2:L12* **An Electrochemical Metallization Memory Cell Based on a Single ZnO Nanowire**
G. MILANO^{1,2}, S. PORRO¹, C. RICCIARDI¹, ¹Politecnico di Torino, Dept. of Applied Science and Tech., Torino, Italy, ²Istituto Italiano di Tecnologia, Center for Sustainable Future Technologies, Torino, Italy
- 10.10 *FM-2:L14* **Multi-level Resistive Switching in Core-Shell ZnO Nanowires Exhibiting Tunable Surface States**
S. PORRO, F. RISPLENDI, G. MILANO, G. CICERO, C. RICCIARDI, Politecnico di Torino, Dept. of Applied Science and Tech., Torino, Italy
- 10.30 *Break*

Chair: Sabina SPIGA, Italy

- 11.00 *FM-2:IL05* **Resistive Memory Technology and Applications**
H.J. BARNABY, School of Electrical, Computer and Energy Engineering Arizona State University, Tempe, AZ, USA
- 11.30 *FM-2:L06* **Dynamics of the Electroforming Process of Valence Change Memory Cells**
S. MENZEL¹, A. MARCHEWKA², T. HEISIG¹, C. BÄUMER¹, R. DITTMANN¹, R. WASER^{1,2}, ¹Forschungszentrum Jülich, Peter Grünberg Institut (PGI-7), Jülich, Germany; ²RWTH Aachen, Institut für Werkstoffe der Elektrotechnik (IWE 2), Aachen, Germany
- 11.50 *FM-2:L07* **Effect of Heavy Ion Radiation on Resistive Switching in HfOx based RRAM Devices Grown by MBE**
S. PETZOLD¹, S.U. SHARATH¹, J. LEMKE¹, E. HILDEBRANDT¹, C. TRAUTMANN², L. ALFF¹, ¹Inst. of Materials Science, Technische Univ. Darmstadt, Darmstadt, Germany; ²Materials Research Dept., Gesellschaft für Schwerionenforschung (GSI), Darmstadt, Germany
- 12.10 *FM-2:L08* **Nonvolatile Impedance Switching in Electroforming-free BFO Memristors**
M. KIANI^{1,4}, NAN DU^{1,4}, N. MANJUNATH¹, D. BÜRGER^{1,4}, I. SKORUPA^{1,3}, S.E. SCHULZ^{4,6}, O.G. SCHMIDT^{1,2}, H. SCHMIDT^{1,4,5}, ¹Matls Systems for Nanoelectronics, Chemnitz Univ. of Tech., Germany; ²Inst. for Integrative Nanosciences, IFW Dresden, Germany; ³Helmholtz-Zentr. Dresden-Rossendorf, Inst. Ion Beam Physics and Matls Res., Dresden, Germany; ⁴Fraunhofer-Inst.f. Elek. Nanosysteme, Abteilung Back-End of Line, Chemnitz, Germany; ⁵Leibniz-Inst.f. Photonische Tech.e.V., Jena, Germany; ⁶Chemnitz Univ. of Technology, Center for Microtechnologies, Germany
- 12.30 *FM-2:L09* **Resistive Switching Modes and Dynamics in Defect Engineered Polycrystalline HfOx based RRAM Devices**
S.U. SHARATH¹, S. PETZOLD¹, E. HILDEBRANDT¹, J. KURIAN¹, P. KOMISSINSKIY¹, C. WENGER², T. SCHROEDER^{2,3}, **L. ALFF**¹, ¹Institute of Materials Science, TU Darmstadt, Darmstadt, Germany; ²IHP, Frankfurt (Oder), Germany; ³Brandenburgische Technische Universität, Cottbus, Germany

Room: **ORVIETO B**

Session FN-3 - Properties

Chair: Andrew WEE, Singapore

- 9.30 *FN-3:IL02* **Electronic and Magnetic Structures of 3D Disordered Network of Nanographene Sheets under Heat Treatment at High Temperatures**
TOSHIKI ENOKI, Department of Chemistry, Tokyo Institute of Technology, Tokyo, Japan
- 10.00 *FN-3:IL03* **Carbon Materials for Sodium-ion Batteries – and the Intriguing Case of Reversibly Intercalating Solvated Ions into Graphite**
P. ADELHELM, Jena University, Jena, Germany
- 10.30 *FN-3:IL05* **Functionalization in Graphene and Related Hybrids for Applications in Hydrogen Evolution Reaction**
LI-CHYONG CHEN, Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; **KUEI-HSIEN CHEN**, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan

11.00 *Break*

Chair: Philipp ADELHELM, Germany

- 11.30 *FN-3:IL06* **The Organic-2D Transition Metal Dichalcogenide Interface**
ANDREW T.S. WEE, Department of Physics, National University of Singapore, Singapore
- 12.00 *FN-3:L08* **Oxide Ceramics Toughened by the Addition of Graphene flakes**
M. BONIECKI, P. GOLEBIEWSKI, K. KASZYCA, W. WESOŁOWSKI, M. WOLUNTARSKI, A. PIATKOWSKA, M. ROMANIEC, P. CIEPIELEWSKI, K. KRZYŻAK, Institute of Electronic Materials Technology, Warsaw, Poland
- 12.20 *FN-3:L09* **Detonation Nanodiamonds. Particles, Hydrosols and Gels**
A.Ya. VUL, E.D. EIDELMAN, A.E. ALEKSEENSKIY, A.V. SHVIDCHENKO, A.T.DIDEIKIN, V.S.YUFEREV, Ioffe Institute, St.Petersburg, Russia; V.T. LEBEDEV, YU.V. KUL'VELIS, B.P. KONSTANTINOV, Petersburg Nuclear Physics Institute, National Research Centre "Kurchatov Institute", Gatchina, Leninradskaya Region, Russia; M.V. AVDEEV, Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research, Dubna, Russia

Room: **MONTEFALCO**

Session FO-3 - Properties of Superconductors

Chair: Fabio BOSCHINI, Canada

9.30 *FO-3:IL10* **Density Waves of HTSC in Atomic Scale**
JINHO LEE, Dept. of Physics and Astronomy, Seoul National University, Republic of Korea
CCES, Institute of Basic Science, South Korea

10.00 *FO-3:IL11* **A Fresh View of the Unusual Properties of the Cuprates**
N. BARISIC, Institute of Solid State Physics, TU Wien, Wien, Austria;
Department of Physics, Faculty of Science, University of Zagreb, Zagreb, Croatia

10.30 *Break*

Chair: James STOREY, New Zealand

Session FO-4 - Theory and Mechanisms

11.00 *FO-4:IL02* **Superconductivity in Time Reversal Symmetry Breaking Compounds**
HUIQIU YUAN, Center for Correlated Matter and Department of Physics, Zhejiang University, China

11.30 *FO-4:IL03* **Superconductivity in Topological Materials: Insights from Superconducting Density Functional Theory**
RYOTARO ARITA, RIKEN Center for Emergent Matter Science, Saitama, Japan

Session FO-5 - Vortex Lattice Physics

12.00 *FO-5:IL03* **Flux Pinning in Oxypnictide Thin Films**
KAZUMASA IIDA^{1,2}, C. TARANTINI³, J. HÄNISCH⁴, F. KURTH⁵, J. JAROSZYNSKI³, T. OHMURA², T. MATSUMOTO¹, T. URATA^{1,2}, T. HATANO^{1,2}, S. MEYER⁴, S. KAUFFMANN-WEISS⁴, B. HOLZAPFEL⁴, D.C. LARBALESTIER³, H. IKUTA^{1,2}, ¹Department of Crystalline Materials Science, Graduate School of Engineering, Nagoya University, Japan; ²Department of Materials Physics, Graduate School of Engineering, Nagoya University, Japan; ³Applied Superconductivity Center, National High Magnetic Field Laboratory, Florida State University, USA; ⁴Institute for Technical Physics, Karlsruhe Institute of Technology, Germany; ⁵Institute for Metallic Materials, IFW Dresden, Germany

Room: **MAGIONE B**

Session FP-2 - Tissue Engineering and Regenerative Medicine

Chair: Jin Ho LEE, South Korea

- 9.30 *FP-2:IL04* **Cell Migration Mediated by Gradient Cues in Biomaterials**
CHANGYOU GAO, Zhejiang University, Hangzhou, China
- 10.00 *FP-2:IL05* **Polymeric and Biomimetic Porous Scaffolds for Tissue Engineering**
GUOPING CHEN, **NAOKI KAWAZOE**, Research Center for Functional Materials, National Institute for Materials Science, Ibaraki, Japan
- 10.30 *FP-2:L07* **Injectable Amnion Membrane Hydrogels for Musculoskeletal Regenerative Engineering**
M. BHATTACHARJEE, J.L. ESCOBAR IVIRICO, H.M. KAN, L.S. NAIR, C.T. LAURENCIN, Institute for Regenerative Engineering, University of Connecticut Health Center, Farmington, CT, USA
- 10.50 *FP-2:L08* **Preparation, Characterization and In Vivo Performance of Decellularized Cornea**
AKIO KISHIDA, Y. HASHIMOTO, J. NEGISHI, K. NAM, T. KIMURA, S. SASAKI, Tokyo Medical and Dental University, Tokyo, Japan; S. SASAKI, T. HONDA, S. HATTORI, H. KOBAYASHI, NIMS, Ibaraki, Japan
- 11.10 *Break*

Session FP-4 - Nanomaterials Systems for Bio-imaging and Theranostics

Chair: Tony Y. HU, USA

- 11.40 *FP-4:IL01* **Surface Modified Nanoparticles for Biomedical Imaging**
PEILIN CHEN, Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan
- 12.10 *FP-4:IL03* **Tumour Environment Responsive Oolymeric Nanomedicine for Multimodality Theranostics**
ZHENGWEI MAO, Department of Polymer Science and Engineering, Zhejiang University, Hangzhou, China

Room: **CORCIANO**

Session FA-3 - Applications of Flexible/Stretchable Electronics

Chair: Francesco GRECO, Austria

- 14.30 *FA-3:IL01* **Ultrathin, Imperceptible Electronics**
M. KALTENBRUNNER, Soft Electronics Laboratory, Linz Institute of Technology, Johannes Kepler University Linz, Austria
- 15.10 *FA-3:IL04* **Wearable Strain Sensors and Power Generators**
I.A. ANDERSON, Biomimetics Lab, Auckland Bioengineering Institute, University of Auckland and StretchSense Ltd., Penrose, Auckland, New Zealand
- 15.50 *Break*
- 16.20 *FA-3:L05* **Metallic Nanoislands on Graphene and Machine Learning for Monitoring Swallowing Activity in Head and Neck Cancer Patients**
J. RAMIREZ¹, D. RODRIQUEZ¹, FANG QIAO³, J. WARCHALL², B.C. MARIN¹, J. RYE¹, E. AKLILE¹, A.S-C. CHIANG¹, P.P. MERCIER², CK CHENG³, K.A. HUTCHESON⁴, E. SHINN⁴, D.J. LIPOMI¹, ¹Dept. of NanoEngineering, University of California, San Diego, La Jolla, CA, USA; Dept. of Electrical and Computer Engineering, University of California, San Diego, La Jolla, CA, USA; Dept. of Computer Science and Engineering, University of California, San Diego, La Jolla, CA, USA; ⁴Dept. of Behavioral Sciences, The University of Texas M.D. Anderson Cancer Center, Unit 1330, Houston, TX, USA
- 16.50 *FA-3:L06* **Development of Lead-free Piezoelectric Ceramic Nanofiber Modules for Flexible Structural Health Monitoring Sensor Application**
SANG HYUN JI, JI SUN YUN, Electronic Convergence Materials Division, Korea Institute of Ceramic Engineering and Technology, Jinju, South Korea

Room: **ASSISI A**

Chair: Santosh SHRESTHA, Australia

Session FB-3 - Organic, Dye Sensitised and Nano-particle Photovoltaics

- 14.30 *FB-3:LO6* **Development of New Narrow Bandgap π -Conjugated Small Molecules for Organic Solar Cells**
SEIICHI FURUKAWA, H. KOMIYAMA, T. YASUDA, Kyushu University, Fukuoka, Japan

Session FB-4 - Multiple Energy Level Devices

- 14.50 *FB-4:IL01* **Two Step Photon Absorption in III-V Solar Cells**
V. TASCO, A. PASSASEO, CNR-Nanotec, Nanotechnology Institute, Campus Ecotekne, Lecce, Italy; A. CRETÌ, M. LOMASCOLO, IMM-CNR Institute for Microelectronic and Microsystems, Campus Ecotekne, Lecce, Italy

15.20 *Break*

- 15.50 *FB-4:IL02* **Recent Advances in Intermediate Band Solar Cells**
A. MARTI, J. VILLA, E. ANTOLIN, P.G. LINARES, C. TABLERO, A. LUQUE, Instituto de Energía Solar, Universidad Politécnica de Madrid, Madrid, Spain; I. RAMIRO, ICFO-Institut de Ciències Fotòniques, Barcelona, Spain; E. LOPEZ, Fraunhofer-Institut für Solare Energiesysteme ISE Freiburg, Germany

Session FB-5 - Excited State Enhanced Solar Cells

- 16.20 *FB-5:IL02* **Nanowires for Tandem Junction Solar Cells**
M.T. BORGSTRÖM, Solid State Physics, Lund University, Lund, Sweden

Room: **ASSISI B**

Session FC-2 - Hydrogen Storage

Chair: Umit DEMIRCI, France

- 14.30 *FC-2.2:IL06* **Metal Borohydrides and Derivatives - Synthesis, Structure and Properties**
T.R. JENSEN, iNANO and Chemistry Department, Aarhus University, Aarhus, Denmark
- 15.00 *FC-2.2:IL07* **Nanoconfined Complex Metal Hydrides for Hydrogen and Ammonia Storage and Catalysis**
P. NGENE, P.E. DE JONGH, Inorganic Chemistry and Catalysis, Debye Institute for Nanomaterials Science, Utrecht University, Netherlands
- 15.30 *Break*
- 16.00 *FC-2.2:IL08* **Physisorption in Porous Mg(BH₄)₂**
Y. FILINCHUK, Institute of Condensed Matter and Nanosciences, Université Catholique de Louvain, Louvain-la-neuve, Belgium
- 16.30 *FC-2.5:IL02* **Storage of Renewable Energy by Reduction of CO₂ with Hydrogen**
A. ZUETTEL, HEENA YANG, LMER, ISIC, SB, Ecole Polytechnique Fédérale de Lausanne (EPFL) Valais/Wallis, Energypolis, Sion, Switzerland, Empa Materials Science and Technology, Dübendorf, Switzerland

Room: **NORCIA**

Session FD-2 - Supercapacitors

Chair: Andrea BALDUCCI, Germany

- 14.30 *FD-2:IL01* **Cost-effective and High-capacity Spinel Pseudo-capacitive Oxides**
NAE-LIH WU, M. ABDOLLAHIFAR, Y.C. LIN, Department of Chemical Engineering, National Taiwan University, Taipei, Taiwan
- 15.10 *FD-2:IL02* **Environmentally Friendly Materials for Supercapacitors**
A. VARZI, S. PASSERINI, Karlsruhe Institute of Technology (KIT) - Helmholtz Institute Ulm (HIU), Ulm, Germany
- 15.50 *FD-2:L03* **3D-printing Electrodes for Electrical Energy Storage**
M. WORSLEY, Lawrence Livermore National Laboratory, Livermore, CA, USA

Room: **SPELLO**

Session FE-2 - Proton-conducting (PEFCs) and Alkaline (AFCs) Polymer Electrolyte Fuel Cells

Chair: Yu MORIMOTO, Japan

14.30 *FE-2:IL11* **Platinum Dissolution: From Model Surfaces to Applied Fuel Cell Catalysts**

S. CHEREVKO, Forschungszentrum Jülich GmbH, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Erlangen, Germany

15.10 *FE-2:L12* **Remaining Challenges in Anion Exchange Membrane Fuel Cells**

D.R. DEKEL, Technion - Israel Institute of Technology, Haifa, Israel

Room: SALA RELATORI

Session FF-2 - Novel Materials for High Efficiency Thermal-to-electrical Energy Conversion

Chair: Qiang LI, USA

- 14.30 *FF-2:IL10* **Solar Thermoelectric Materials Development**
A. WEIDENKAFF, WENJIE XIE, XINGXING XIAO, University of Stuttgart, Stuttgart, Germany
- 15.10 *FF-2:IL11* **Structural Features and Transport Properties in Ternary and Quaternary Thermoelectric Sulfides**
E. GUILMEAU¹, C. BOURGES¹, V. PAVAN KUMAR¹, L. PARADIS-FORTIN^{1,2}, P. LEMOINE², O.I. LEBEDEV¹, T. BARBIER¹, B. RAVEAU¹, B. MALAMAN³, G. LE CAER⁴, M. OHTA⁵, K. SUEKUNI⁶, A.R. SUPKA⁷, R. AL RAHAL AL ORABI⁷, M. FORNARI⁷, ¹Lab. CRISMAT, Caen, France; ²Institut des Sciences Chimiques de Rennes (ISCR), Rennes, France; ³Institut Jean Lamour, Vandœuvre-lès-Nancy, France; ⁴Institut de Physique de Rennes (IPR), Rennes, France; ⁵Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; ⁶Dept. of Applied Science for Electronics and Materials, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Japan; ⁷Dept. of Physics and Science of Advanced Materials Program, Central Michigan University, USA
- 15.50 *FF-2:L12* **Thermoelectric Properties of Mn₂V(Al_{1-x}Si_x) Full-Heusler Alloys**
HEZHANG LI, KEI HAYASHI, YUZURU MIYAZAKI, Tohoku University, Sendai, Japan
- 16.20 *Break*

Session FF-3 - Devices Technologies and Applications for Thermoelectrics, Thermionics, and Thermophotovoltaics

Chair: Victor I. KUZNETSOV, Russia

- 16.50 *FF-3:IL05* **Variation in Device Design for Low \$/W and Flexible System**
WOOCHUL KIM, Yonsei University, Seoul, South Korea
- 17.30 *FF-3:L06* **Importance of Electrical Impedance Matching on Efficiency and Power in Integrated Thermoelectric Generator Circuits**
MARK LEE, Department of Physics, The University of Texas at Dallas, Richardson, TX, USA

Room: **SPOLETO A**

Session FG-3 -Magnetocaloric and Multifunctional Magnetic Materials

Chair: Simone FABBRICI, Italy

- 14.30 *FG-3:IL04* **Materials with Giant Mechanocaloric Effects: Cooling by Strength**
L. MANOSA, A. PLANES, Departament de Física de la Matèria Condensad, Universitat de Barcelona, Barcelona, Spain
- 15.00 *FG-3:IL05* **Structural Instabilities of Heusler Alloys**
P. ENTEL, University Duisburg-Essen, Duisburg, Germany; **V. SOKOLOVSKIY**, Chelyabinsk State University, Chelyabinsk, Russia
- 15.30 *FG-3:IL06* **Shell Magnetism in Heusler Compounds**
M. ACET¹, A. CAKIR², ¹Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; ²Department of Metallurgical and Materials Engineering, Mugla Sitki Kocman University, Mugla, Turkey
- 16.00 *Break*

Chair: Mehmet ACET, Germany

- 16.30 *FG-3:L07* **Ni-Mn-In Heusler Alloys Showing both Direct and Inverse Magnetocaloric Effect for Room Temperature Magnetic Refrigeration**
S. FABBRICI, MIST E-R scrI, Bologna, Italy; C. BENNATI, R. CABASSI, D. CALESTANI, F. ALBERTINI, IMEM-CNR, Parma, Italy; F. CUGINI, N. SARZI AMADE, M. SOLZI, SMFI Department, University of Parma, Parma, Italy; A. PEPICIELLO, C. VISIONE, Engineering dep., University of Sannio, Benevento, Italy
- 16.50 *FG-3:IL09* **Kinetics of the Heat Flux Avalanches at the First Order Magnetic Transitions in Magnetocaloric Materials**
V. BASSO¹, M. PIAZZI^{1,2}, C. BENNATI³, ¹Istituto Nazionale di Ricerca Metrologica, Torino, Italy; ²Università degli Studi di Pavia, Pavia, Italy; ³Istituto dei Materiali per l'Elettronica ed il Magnetismo - CNR, Parma, Italy

Room: **SALA STAMPA**

Session FH-2 - Understanding Fundamentals of Photo-induced Processes and Charge Transport

Chair: Jan AUGUSTYNSKI, Poland

- 14.30 *FH-2:IL08* **Studying Mobile Charge-Carriers in Photocatalytic Particles by Time Resolved Microwave Conductivity: Recent Developments**
C. COLBEAU-JUSTIN, A. HERISSAN, A.L. LUNA BARRON, M.G. MENDEZ MEDRANO, H. REMITA, Laboratoire de Chimie Physique, CNRS UMR 8000, Université Paris-Sud, Université Paris-Saclay, Orsay, France
- 15.10 *FH-2:IL11* **Photocarrier Transport and Transfer in Emerging Transition Metal Oxide Photoelectrodes**
I.D. SHARP^{1,2}, J.K. COOPER², CHANG-MING JIANG², G. SEGEV²,
¹Walter Schottky Institut and Physik Department, Technische Universität München, Garching, Germany; ²Joint Center for Artificial Photosynthesis and Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

Room: **BEVAGNA**

Session FI-2 - Optoelectronic and Photonic Processes

Chair: Pierre LEFEBVRE, France

14.30 *FI-2:IL07* **Fabrication of High-quality AlN Template by High-temperature Annealing**

HIDETO MIYAKE, SHIYU XIAO, YUSUKE HAYASHI, KANAKO SHOJIKI, Mie University, Tsu, Japan

15.10 *FI-2:IL08* **Simultaneous Tenfold Brightness Enhancement and Emitted-light Spectral Tunability in Transparent Ambipolar Organic Light-emitting Transistor by Integration of High-k Photonic Crystal**

S. TOFFANIN, Istituto per lo Studio dei Materiali Nanostrutturati (ISMN), Consiglio Nazionale delle Ricerche (CNR), Bologna, Italy

15.50 *Break*

Chair: Hideto MIYAKE, Japan

16.20 *FI-2:IL09* **THz-QCLs toward High Output Power near Liquid Nitrogen Temperature Operation**

TSUNG-TSE LIN, HIDEKI HIRAYAMA, Center for Advanced Photonics, RIKEN, Sendai, Japan

17.00 *FI-2:L10* **Omni-friendly Low Color Temperature OLED**

JWO-HUEI JOU, M. SINGH, H.-F. LIN, Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

Room: **CASCIA**

Session FJ-2 - Material Design and Device Development

Chair: John F. WAGER, USA

14.30 *FJ-2:IL12b* **Transparent Diluted Magnetic and Plasmonic Metal Oxide Nanocrystals**

P.V. RADOVANOVIC, Department of Chemistry, University of Waterloo, Waterloo, ON, Canada

15.10 *FJ-2:IL13* **Physical Properties and Applications of Doped BaSnO₃ Semiconductors with High Electrical Mobility and Optical Transparency**

KEE HOON KIM, Center for Novel States of Complex Materials Research and Institute of Applied Physics, Department of Physics and Astronomy, Seoul National University, Seoul, South Korea

15.50 *FJ-2:IL15* **Photonic Processing for Metal Oxide Thin Films**

D.C. KOUTSOGEORGIS, Nottingham Trent University, Nottingham, UK

16.30 *Break*

Chair: Kee Hoon KIM, South Korea

17.00 *FJ-2:IL16* **Interface Chemistry for Organic Electronics and Opto-electronics**

S.R. MARDER, School of Chemistry and Biochemistry, School of Materials Science and Engineering, and Center for Organic Photonics and Electronics, Georgia Institute of Technology, Atlanta, GA, USA

17.40 *FJ-2:L17* **In-Ga-Zn-O Thin Films with Tunable Optical and Electrical Properties Prepared by Reactive High-power Impulse Magnetron Sputtering**

J. REZEK, J. HOUSKA, M. PROCHAZKA, S. HAVIAR, Department of Physics and NTIS - European Centre of Excellence, University of West Bohemia, Plzen, Czech Republic

Room: **SPOLETO B**

Session FK-6 - Radiation Effects

Chair: Xavier DESCHANELS, France

14.30 *FK-6:IL01* **A Real Space Multiscale Model for the Deformation and Swelling of Components under High-energy Neutron Irradiation**

S.L. DUDAREV^{1,2}, D.R. MASON¹, E. TARLETON², P-W. MA^{1,3}, A.E. SAND⁴, ¹UK Atomic Energy Authority, Oxfordshire, UK; ²Department of Materials, University of Oxford, Oxford, UK; ³Department of Engineering Science, University of Oxford, Oxford, UK; ⁴Department of Physics, University of Helsinki, Finland

15.00 *FK-6:IL02* **Hydrogen Isotope Retention in Neutron-irradiated Tungsten Exposed to High Flux Plasma**

MASASHI SHIMADA, Idaho National Laboratory, Idaho Falls, ID, USA

15.30 *FK-6:IL03* **Pancake-like Growth and Coalescence of Intergranular Helium Bubbles: In situ Observation and Analytical Modelling**

HEFEI HUANG¹, JIE GAO^{1,2}, XIANG LIU³, YAN LI¹, ¹Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai, China; ²School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China; ³Department of Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA

16.00 *Break*

Session FK-8 - Crosscutting Materials Issues for Nuclear Fission and Fusion Systems

Chair: Marek RUBEL, Sweden

16.30 *FK-8:IL01* **Low Activation Structural Materials for Nuclear Fission and Fusion Reactors - the RF R&D**

V.M. CHERNOV, M.V. LEONTIEVA-SMIRNOVA, A.A. BOCHVAR, High-technology Research Institute of Inorganic Materials, Moscow, Russia

17.00 *FK-8:IL02* **Challenges of Simulating Neutron-induced Radiation Damage Using Ion Beams**

G.S. WAS, University of Michigan, Ann Arbor, MI, USA

Room: **MAGIONE A**

Session FL-3 - Photonic Devices with Biological and Bio-inspired Materials

Chair: Yasuhiro ISHIDA, Japan

14.30 *FL-3:IL06* **Peptide Integrated Optics: From Optical Waveguides To Implantable BioChips**

G. ROSENMAN, N. LAPSHINA, School of Electrical Engineering, Faculty of Engineering, Tel Aviv University, Israel; B. APTER, A. HANDEMAN, Faculty of Engineering, Holon Institute of Technology, Holon, Israel

15.10 *FL-3:IL07* **Circular Polarization Reflections from Beetles - What do they tell us?**

K. WEIR, Blackett Laboratory, Department of Physics, Imperial College London, London, UK

15.50 *Break*

Chair: Gil ROSENMAN, Israel

16.20 *FL-3:IL08* **Lasers and Optical Cavities Made out of Biological Materials**

M. HUMAR, J. Stefan Institute, Ljubljana, Slovenia; and Faculty of Mathematics and Physics, University of Ljubljana, Ljubljana, Slovenia

17.00 *FL-3:IL09* **Up-scaling of Bio-inspired Polymer Films for Optical Applications**

F. VÜLLERS, S. SCHAUER, J. SYURIK, M. KAVALENKA, **H. HÖLSCHER**, Karlsruhe Institute of Technology, Karlsruhe, Germany

Room: **ORVIETO A**

Session FM-2 - Resistance Switching (RRAM) and Phase Change (PCM) Memories

Chair: Abu SEBASTIAN, Switzerland

- 14.30 *FM-2:IL15* **Exploiting Nanoscale Effects in Phase Change Memories**
M. SALINGA, RWTH Aachen University, Aachen, Germany
- 15.00 *FM-2:IL16* **Ovonic Threshold Switching Selector: From Material Engineering to Device Performance Improvement**
G. NAVARRO, **A. VERDY**, V. SOUSA, M. BERNARD, G. BOURGEOIS, F. FILLOT, N. CASTELLANI, C. SABBIONE, P. NOE, J. GARRIONE, L. FELLOUH, G. MOLAS, M.C. CYRILLE, E. NOWAK, CEA-LETI, Grenoble, France
- 15.30 *FM-2:IL17* **Atomistic Simulations of Crystallization and Aging of GeTe Nanowires**
S. GABARDI, E. BALDI, E. BOSONI, D. CAMPI, S. CARAVATI, **M. BERNASCONI**, Dip. Scienza dei Materiali, Università di Milano-Bicocca, Milano, Italy; G.C. SOSSO, Dept. of Physics and Astronomy, University College London, UK; J. BEHLER, Inst. f. Physikalische Chemie, Theoretische Chemie, Univ. Goettingen, Germany
- 16.00 *FM-2:IL19* **Van der Waals Gap Reconfiguration and Switching Mechanism in Ge-Sb-Te Superlattices**
A.V. KOLOBOV, P. FONS, Y. SAITO, J. TOMINAGA, Nanoelectronics Research Institute, National Institute of Advanced Industrial Science & Technology, Tsukuba Central 5, Tsukuba, Ibaraki, Japan
- 16.30 *Break*

Chair: Ilia VALOV, Germany

- 16.50 *FM-2:L20* **Unipolar Resistive Switching in Pt/MgO/TaOx/Ta/Ru Thin Films**
C. DIAS, L.M. GUERRA, B.D. BORDALO, J. VENTURA, IFIMUP-IN and Dept. of Physics and Astronomy, Faculty of Sciences, Porto, Portugal; HUA LV, S. CARDOSO, P.P. FREITAS, INESC-MN and IN - Institute of Nanoscience and Nanotechnology, Lisboa, Portugal; A.M. FERRARIA, A.M. BOTELHO DO REGO, Centro de Química-Física Molecular and IN, IST, Universidade de Lisboa, Lisboa, Portugal
- 17.10 *FM-2:L21* **Epitaxial Stabilization of Single Crystalline Semiconducting and Metallic NbO₂**
J.E. BOSCHKER, S. BIN ANOOZ, T. MARKURT, M. ALBRECHT, J. SCHWARZKOPF, Leibniz Inst. for Crystal Growth, Berlin, Germany; S. BIN ANOOZ, Physics Dept., Fac. of Science, Hadhramout University, Mukalla, Yemen; P. PETRIK, B. KALAS, Inst. of Technical Physics and Materials Science, Budapest, Hungary; M. RAMSTEINER, Paul-Drude-Inst. f. Festkörperelektronik, Berlin, Germany
- 17.30 *FM-2:L22* **Magnetism as a Probe of the Origin of Memristive Switching in Oxide Semiconductors**
X.L. WANG, **A. RUOTOLO**, Dept. of Materials Science and Eng., City University of Hong Kong, Kowloon, Hong Kong SAR, China

Session FM-3 - Emerging Applications for Non-volatile Memories

- 17.50 *FM-3:IL14* **Memory Systems in Biology Modeled by Analog Electronics**
R. DANIEL, Biomedical Engineering Dept., Israel Institute of Technology (Technion), Israel

Room: **ORVIETO B**

Session FN-2 - Structural Characterization

Chair: Ovidiu ERSEN, France

- 14.30 *FN-2:IL04* **Small Angle Neutron Scattering for Characterization of Carbon Nanostructures**
V.T. LEBEDEV, Saint-Petersburg Nuclear Physics Institute, National Research Center "Kurchatov Institute", Saint-Petersburg, Russia
- 15.00 *FN-2:IL05* **Interface and Properties of Nanocrystalline CVD diamond on AlGaIn/GaN Heterostructures**
K. HAENEN, Hasselt University, Institute for Materials Research (IMO), Diepenbeek, Belgium; IMEC vzw, IMOMEK, Diepenbeek, Belgium
- 15.30 *FN-2:IL06* **Potential Environmental Impact of Carbon Nanomaterials**
E. FLAHAUT¹, L. LAGIER², L. EVARISTE², A. MOTTIER², F. MOUCHET², P. LONCHAMBON¹, G. CHIMOWA¹, B. SOULA¹, A.-M. GALIBERT¹, E. PINELLI², L. GAUTHIER², ¹CIRIMAT, Interuniversity Engineering and Research Centre on Materials UMR CNRS-UPS-INPT N°5085, Toulouse, France; ²ECOLAB, University of Toulouse, CNRS, INPT, UPS, Castanet-Tolosan, France
- 16.00 *FN-2:IL07* **Measurement of Graphene/Metal Contact Resistance using Kelvin Probe Force Microscopy**
W. MERTIN, G. BACHER, Universität Duisburg-Essen, Werkstoffe der Elektrotechnik and CENIDE, Duisburg, Germany; C. ALVARADO CHAVARIN, present address: Innovations for High Performance Microelectronics IHP GmbH, Frankfurt (Oder), Germany
- 16.30 *FN-2:IL08* **Laser-induced Breakdown Spectroscopy: A Perspective Method for Nanocarbon Materials Characterization**
V.F. LEBEDEV, N.V. NIKONOROV, ITMO University, Saint-Petersburg, Russia; M.K. RABCHINSKII, A.V. SHVIDCHENKO, A.Ya. VUL', Ioffe Institute, St. Petersburg, Russia
- 16.50 *Break*

Session FN-4 - Applications

Chair: Maurizio PRATO, Italy

- 17.10 *FN-4:IL05* **Carbon Nano-onions as Nanoprobe for Cancer Therapy**
S. GIORDANI, Department OF CHEMISTRY, UNIVERSITÀ DI TORINO, TURIN, ITALY; AND NANO CARBON MATERIALS, Istituto Italiano di Tecnologia, Turin, Italy
- 17.40 *FN-4:IL06* **Side-gated Nanoscale Diamond Transistors**
A.C. PAKPOUR-TABRIZI, **R.B. JACKMAN**, London Centre for Nanotechnology and the Department of Electronic and Electrical Engineering, University College London, London, UK

Room: **MONTEFALCO**

Session FO-4 - Theory and Mechanisms

Chair: Ryotaro ARITA, Japan

14.30 *FO-4:IL06* **Robust Dynamical Charge Density Waves in High-Tc Superconducting Cuprates**

M. GRILLI, Dipartimento di Fisica, Università di Roma "Sapienza", Rome, Italy

15.00 *FO-4:IL07* **Fermi Surface Reconstruction in the Pseudogap State**

J. STOREY, Robinson Research Institute, Victoria University of Wellington, Wellington, New Zealand

15.30 *Break*

Session FO-6 - Synthesis and Processing

16.00 *FO-6:IL01* **Growth and Properties of Novel Superconducting Materials**

G. LOGVENOV, **GIDEOK KIM**, Max Planck Institute for Solid State Research, Stuttgart, Germany

Room: **MAGIONE B**

**Session FP-3 - New Therapeutics and Intelligent Drug/
Biomolecule/Gene Delivery Systems**

Chair: Atsushi TAMURA, Japan

14.30 *FP-3:IL03* **Intracellular Delivery of Nanocarriers and Targeting to Subcellular Organelles**

V. TORCHILIN, Center for Pharmaceutical Biotechnology and Nanomedicine, Northeastern University, Boston, MA, USA

15.00 *FP-3:IL05* **Targeted and Controlled Delivery of an Anti-tumor Chelator to Brain Cancer Cells**

S. MAJD, University of Houston, Houston, TX, USA

15.30 *Break*

Chair: Sheereen MAJD, USA

16.00 *FP-3:IL04* **“Borono-lectin” Engineering as a Versatile Platform for Intelligent Drug Delivery Systems**

AKIRA MATSUMOTO, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan

Session FP-5 - Clinical Translations in Diagnosis and Therapy, and in Implantable Prostheses and Micro-nano Devices

16.30 *FP-5:IL01* **Advanced Nanobiomaterials for Neural Interfaces**

M.R. ABIDIAN, Biomedical Engineering, University of Houston, Houston, TX, USA

Room: **CORCIANO**

Session FA-3 - Applications of Flexible/Stretchable Electronics

Chair: Martin KALTENBRUNNER, Austria

- 9.30 *FA-3:IL08* **Temporary Tattoo Ink-jet Printed Multi-Electrode Array for Electrophysiology Applications**
F. GRECO, Institute of Solid State Physics, Graz University of Technology, Austria
- 10.10 *FA-3:L09* **The Glass Transition Temperature as a Means of Kinesthetic Feedback**
C.W. CARPENTER, SIEW TING M. TAN, D. RODRIQUEZ, K. SKELIL, D.J. LIPOMI, University of California, San Diego, Dept. of Nanoengineering, South Pasadena, CA, USA
- 10.40 *Break*

Chair: Mario CAIRONI, Italy

- 11.10 *FA-3:IL10* **Wearable Electronic Dystem Based on Stretchable Carbon Nanotube Electronics and Ultrathin Organic Light Emitting Diodes**
JA HOON KOO^{1,2}, DAE-HYEONG KIM^{1,2,3}, ¹Center for Nanoparticle Research, Institute for Basic Science (IBS), Seoul, South Korea; ²Interdisciplinary Program for Bioengineering, Seoul National University, Seoul, South Korea; ³School of Chemical and Biological Engineering, Institute of Chemical Processes, Seoul National University, Seoul, South Korea
- 11.50 *FA-3:IL11* **Soft and Inert Composites and Devices for Neural Interfaces**
K. TYBRANDT, Laboratory of Organic Electronics, Linköping University, Norrköping, Sweden

Room: **ASSISI A**

Session FB-6.2 - Theoretical Modelling of Materials and Devices

Chair: Trystan WATSON, UK

- 9.30 *FB-6.2:IL01* **Device Physics of Perovskite Solar Cells**
W. TRESS, EPFL, Lausanne, Switzerland
- 10.00 *FB-6.2:IL02* **Charge Carrier Diffusion and Trapping Models in Lead Halide Perovskites**
HIROKI URATANI, **KOICHI YAMASHITA**, Department of Chemical System Engineering, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan
- 10.30 *Break*

Chair: Tsutomu MIYASAKA, Japan

Session FB-6.4 - Design of Lead-free New Materials

- 11.00 *FB-6.4:IL01* **Enhancement of Sn-perovskite Solar Cells from View Point of Hetero-interface Design and Crystal Defect Density**
SHUZI HAYASE, Kyushu National Institute of Technology, Kitakyushu, Japan
- 11.30 *FB-6.4:L02* **Bismuth and Antimony-based Lead Free Double Perovskites in Solar Cells**
M. PANTALER, C. FETTKENHAUER, I. ANUSCA, D.C. LUPASCU, Institute for Materials Science, University of Duisburg-Essen, Essen, Germany

Session FB-6.5 - Scale up, Module Development and Measurement Protocols

- 11.50 *FB-6.5:IL01* **Carbon Perovskite Solar Cells from Laboratory to Factory**
T. WATSON, SPECIFIC Swansea University, Swansea, UK
- 12.20 *FB-6.5:L04* **Development of Pb-free Perovskites and their Application for Solar Cells**
CHU ZHANG¹, LIGUO GAO², SHUZI HAYASE¹, **TINGLI MA**^{1,2},
¹Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology, Kitakyushu, Fukuoka, Japan;
²School Petroleum and Chemical Engineering, Dalian University of Technology, Panjin Campus, Pan-jin, Liaoning, China

Room: **ASSISI B**

Session FC-2 - Hydrogen Storage

Chair: Michael HIRSCHER, Germany

- 9.30 *FC-2.1:IL04* **Influence of Composition and Stoichiometry on the Hydrogenation Properties of Phase Intergrowth Alloys**
M. LATROCHE, N. MADERN, J. MONNIER, JUNXIAN ZHANG,
Université Paris Est, ICMPE, CNRS-UPEC, Thiais, France
- 10.00 *FC-2.1:L05* **Microstructure and Hydrogen Storage Properties of Ti1V0.9Cr1.1 alloy with addition of x wt.% Zr (x= 0, 2, 4, 8 and 12)**
S. SLEIMAN, **J. HUOT**, Hydrogen Research Institute, Université du Québec à Trois-Rivières, Trois-Rivières, Québec, Canada
- 10.20 *FC-2.1:L06* **Mg₂FeH₆ for Hydrogen Storage and Lithium Batteries**
A. PAOLONE, **O. PALUMBO**, CNR-ISC, U.O.S. La Sapienza, Roma, Italy; F. TREQUATTRINI, Dipartimento di Fisica, Sapienza Università di Roma, Roma, Italy; P. REALE, ENEA - Centro Ricerche Casaccia, Roma, Italy; S. BRUTTI, Dipartimento di Scienze, Università della Basilicata, Potenza, Italy
- 10.40 *Break*

Chair: Andreas ZUETTEL, Switzerland

- 11.10 *FC-2.4:IL01* **H₂ Sorption in Composite Materials Based on Metal-organic Hybrid Frameworks**
P.A. SZILAGYI, Queen Mary University of London, London, UK
- 11.40 *FC-2.4:IL03* **Gravimetric and Volumetric Hydrogen Storage Capacity in Metal-organic Frameworks**
M. HIRSCHER, M. SCHLICHTENMAYER, R. BALDERAS-XICOHTÉNCATL, Max Planck Institute for Intelligent Systems, Stuttgart, Germany
- 12.10 *FC-2.7:L03* **Nanocluster-based Hydrogen Gas Sensors (CuO/WO₃) Prepared by Advanced Magnetron Sputtering Techniques**
S. HAVIAR, J. CAPEK, University of West Bohemia, Faculty of Applied Sciences, NTIS and Department of Physics, Plzen, Czech Republic

Room: **NORCIA**

Chair: Arumugam MANTHIRAM, USA

Session FD-2 - Supercapacitors

- 10.00 *FD-2:IL05* **Novel Electrolytes for Supercapacitors**
A. BALDUCCI, L. HENNING HESS, C. SCHÜTTER, J. KRUMMACHER, Friedrich-Schiller-University Jena, Institute for Technical Chemistry and Environmental Chemistry, Center for Energy and Environmental Chemistry, Jena (CEEC Jena), Jena, Germany

Session FD-3 - Application Engineering

- 10.40 *FD-3:IL02* **Materials Engineering Challenges for Viable Li-S Battery Electrodes and Cells**
S. TRABESINGER, Electrochemistry Laboratory, Paul Scherrer Institute, Villigen PSI, Switzerland
- 11.20 *FD-3:IL03* **Economic and Ecological Sustainability Analysis of Batteries for Stationary Applications**
M. WEIL, M. BAUMANN, KIT/ITAS, Karlsruhe, Germany; J. PETERS, KIT/HIU, Ulm, Germany

Room: SPELLO

Session FE-3 - Direct Alcohol Fuel Cells (DAFCs)

Chair: Maria V. MARTINEZ-HUERTA, Spain

9.00 *FE-3:L01* **Ru-modified Carbons by Organometallic Functionalization as Support for Nanostructured Pt: High Performance Pt-Ru Catalysts for the Oxidation of Methanol and Ethanol in Alkaline Media**

E. CANDIA-GARCIA¹, J.A. DIAZ-GUILLEN¹, J.C. MARTINEZ-LOYOLA², A.A. SILLER-CENICEROS³, M.E. SANCHEZ-CASTRO³, M. SANCHEZ-VAZQUEZ⁴, B. ESCOBAR-MORALES⁵, I.L. ALONSO-LEMUS⁶; **F.J. RODRIGUEZ-VARELA**³, ¹Instituto Tecnológico de Saltillo, Saltillo, Coahuila, México; ²Universidad Tecnológica de Coahuila, Ramos Arizpe, Coahuila, México; ³Sustentabilidad de los Recursos Naturales y Energía, Cinvestav Unidad Saltillo, Ramos Arizpe, Coahuila, México; ⁴Centro de Investigación en Materiales Avanzados, PIIT, Apodaca, NL, México; ⁵CONACYT, Centro de Investigación Científica de Yucatán, Mérida, Yucatán, México; ⁶CONACYT, Sustentabilidad de los Recursos Naturales y Energía, Cinvestav Unidad Saltillo, México

9.30 *FE-3:L02* **Synthesis and Characterization of Co-N-C and Fe-N-C for Application as Methanol Tolerant Catalysts in DMFCs**

C. LO VECCHIO, G. MONFORTE, A.S. ARICÒ, **V. BAGLIO**, Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano" (ITAE-CNR), Messina, Italy

10.00 *FE-3:L03* **Activity and Degradation Study of a Fe-N-C Catalyst for ORR in Direct Methanol Fuel Cell (DMFC)**

I. MARTINAIOU^{1,2}, A.H.A. MONTEVERDE VIDELA³, S. SPECCHIA³, U.I. KRAMM^{1,2}, ¹TU Darmstadt, Catalysts and Electrocatalysts, Dept. of Materials- and Earth Science and Dept. of Chemistry, Darmstadt, Germany; ²Graduate School of Excellence Energy Science and Engineering, Darmstadt, Germany; ³Politecnico di Torino, Dip. Scienza Applicata e Tecnologia, Torino, Italy

10.30 *Break*

Chair: Vincenzo BAGLIO, Italy

11.00 *FE-3:IL04* **Electrocatalyst Supports for Direct Methanol Fuel Cells**

M.V. MARTINEZ-HUERTA, Institute of Catalysis and Petrochemistry, CSIC, Madrid, Spain

11.40 *FE-3:IL05* **Understanding Water and Methanol Transport Properties in Ionomers and Composite Membranes Based on Non-fluorinated Polymers for Fuel Cell Applications**

I. NICOTERA, C. SIMARI, Dept. of Chemistry and Chemical Technology, University of Calabria, Rende (CS), Italy; A. ENOTIADIS, National Center for Scientific Research "Demokritos", Athens, Greece

Room: SALA RELATORI

Session FF-2 - Novel Materials for High Efficiency Thermal-to-electrical Energy Conversion

Chair: Maarit KARPPINEN, Finland

- 9.00 *FF-2:IL05* **Highly Efficient Silicides Based Thermoelectric Materials**
T. KYRATSI, Department of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus
- 9.40 *FF-2:IL06* **Transport Properties of Homologous Compounds (PbSe)₅(Bi₂Se₃)_{3m} (m = 1, 2 and 3)**
S. SASSI, **C. CANDOLFI**, A. DAUSCHER, B. LENOIR, Institut Jean Lamour, UMR 7198 CNRS, Université de Lorraine, Campus Artem, Nancy Cedex, France
- 10.20 *FF-2:IL07* **Renewed Interest for Heusler and Half-Heusler Alloys for Thermoelectric Applications**
E. BAUER, B. HINTERLEITNER, I. KNAPP, A. GRYSIV, Technische Universität Wien, Institute of Solid State Physics, Vienna, Austria; P. ROGL, G. ROGL, University of Vienna, Institute of Material Chemistry; A. TAVASSOLI, University of Vienna, Institute of Material Chemistry and C. Doppler Laboratory for Thermoelectricity, Vienna, Austria
- 11.00 *Break*

Session FF-3 - Devices Technologies and Applications for Thermoelectrics, Thermionics, and Thermophotovoltaics

Chair: Ryoji FUNAHASHI, Japan

- 11.30 *FF-3:IL02* **Ultra High Temperature Thermophotovoltaic Technology Combined with Thermionic Energy Conversion**
A. DATAS, E. ANTOLIN, P.G. LINARES, J. VILLA, A. MARTI, Instituto de Energía Solar, Universidad Politécnica de Madrid, Madrid, Spain; D.M. TRUCCHI, **A. BELLUCCI**, M. GIROLAMI, Istituto di Struttura della Materia - Consiglio Nazionale delle Ricerche, Monterotondo Scalo, Rome, Italy; A. VITULANO, G. SABBATELLA, Ionvac Process SRL. Colli di Enea, Rome, Italy
- 12.10 *FF-3:IL09* **Thermoelectric Power Generation from Nanostructured PbTe and Colusite: Materials and Modules**
MICHIHIRO OHTA, P. JOOD, ATSUSHI YAMAMOTO, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan; KOICHIRO SUEKUNI, Kyushu University, Kasuga, Fukuoka, Japan; M.G. KANATZIDIS, Northwestern University, Evanston, Illinois, USA, and Argonne National Laboratory, Argonne, Illinois, USA

Room: SPOLETO A

Session FG-3 - Magnetocaloric and Multifunctional Magnetic Materials

Chair: Lluís MANOSA, Spain

- 9.30 *FG-3:IL10* **Efficient Energy-conversion near Room-temperature with Transition Metal Based Magnetic Materials**
E. BRUECK, N. VAN DIJK, Fundamental Aspects of Materials and Energy, Faculty of Science, TU Delft, Delft, Netherlands
- 10.00 *FG-3:IL11* **Magnetocaloric Performance of La(FeSi)₁₃ Compounds**
L.E. COHEN, Imperial College London, London, UK
- 10.30 *FG-3:IL12* **Molecular Spin Crossover Crystals as Barocalorics**
S. VALLONE^{1,2}, A.M. DOS SANTOS³, J. MOLAISSON³, M. HALCROW⁴, **K. SANDEMAN**^{1,2}, ¹The Graduate Center of The City University of New York, USA; ²Brooklyn College of The City University of New York, USA; ³Oak Ridge National Laboratory, USA; ⁴University of Leeds, USA
- 11.00 *Break*

Chair: Lesley COHEN, UK

- 11.30 *FG-3:IL13* **Manipulating Magnetic Frustration for Caloric Effects**
J.B. STAUNTON, E. MENDIVE-TAPIA, Department of Physics, University of Warwick, Coventry, UK
- 12.00 *FG-3:IL14* **Tuning Magnetism and Functional Properties in Ferromagnetic Shape Memory Films and Nanodisks**
F. CASOLI, M. TAKHSHA GHAFAROKHI, L. NASI, R. CABASSI, F. ALBERTINI, IMEM - CNR, Parma, Italy; S. FABBRICI, MIST E-R Laboratory, Bologna, Italy; F. CELEGATO, G. BARRERA, P. TIBERTO, INRIM, Torino, Italy; M. CAMPANINI, EMPA, Dübendorf, Switzerland; C. MAGEN, Instituto de Nanociencia de Aragón, Zaragoza, Spain; V. GRILLO, NANO - CNR, Modena, Italy

Room: SALA STAMPA

Session FH-3 - Design Approaches for Advanced Applications

Chair: Ib CHORKENDORFF, Denmark

- 9.00 *FH-3:IL03* **Transient Phenomena in Photocatalysis, as Studied by Ultrafast FTIR Measurements**
Y. PAZ, I. BENISTI, A. BEN REFAEL, Department of Chemical Engineering, Technion, Haifa, Israel
- 9.40 *FH-3:L04* **New Strategy for Micro-plastic Degradation: Green Photocatalysis Using a Protein-based Porous N-TiO₂ Semiconductor**
M.C. ARIZA-TARAZONA, J.F. VILLAREAL-CHIU, Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., Mexico; C. MUGONI, V. BARBIERI, C. SILIGARDI, Università degli Studi di Modena e Reggio Emilia, Dipartimento di Ingegneria "Enzo Ferrari", Modena, Italy; E.I. CEDILLO-GONZÁLEZ, Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., Mexico
- 10.10 *FH-3:L05* **Optical Emission from Catalytic Combustion of MeOH/air on Yb₂O₃ Supported Metal Catalysts**
J. TERRENI^{1,2}, A. WENGER¹, R. HOLZNER³, A. BORGSCHULTE^{1,2},
¹Laboratory of Advanced Analytical Technologies, Empa, Dübendorf, Switzerland; ²University Zürich, Department of Chemistry, Zürich, Switzerland; ³Econimo-Drive AG, Cham, Switzerland
- 10.40 *Break*

Chair: Gabriele CENTI, Italy

- 11.10 *FH-3:IL06* **Modelling of Solar Water Splitting Devices**
S. HAUSSENER, Laboratory of Renewable Energy Science and Engineering, EPFL, Switzerland
- 11.50 *FH-3:IL07* **Coupling Peroxidase Enzymes with Photocatalytic Hydrogen Peroxide Production**
B.O. BUREK, **J.Z. BLOH**, DECHEMA-Forschungsinstitut, Frankfurt, Germany; D.W. BAHNEMANN, Leibniz Universität Hannover, Germany

Room: **BEVAGNA**

Session FI-3 - Electro-optical-structural Characterization

Chair: Motoaki IWAYA, Japan

- 9.30 *FI-3:IL01* **Light-emitting Electrochemical Cells: Towards Low-cost Fabrication and High-efficiency Operation**
L. EDMAN, The Organic Photonics and Electronics Group, Umeå University, Umeå, Sweden
- 10.10 *FI-3:L02* **Charge Injection Investigation at the Interface between Metal Contact and Active Layer in Organic Field-effect Transistors**
M. NATALI, S.D. QUIROGA, A. LONGO, E. BENVENUTI, F. MERCURI, F. PRESCIMONE, S. TOFFANIN, ISMN-CNR, Bologna, Italy; M. BUONOMO, N. LAGO, A. CESTER, UniPd, Padova, Italy
- 10.40 *Break*
- 11.10 *FI-3:IL04* **Inorganic Perovskite Crystals for Fast Color-conversion Applications**
N. LAURAND, Institute of Photonics, Dept. of Physics, SUPA, University of Strathclyde, Glasgow, UK

Room: **CASCIA**

Session FJ-2 - Material Design and Device Development

Chair: Daniel NEUMAIER, Germany

- 9.00 *FJ-2:IL18* **Growth and Properties of Ga₂O₃ Thin Films**
R. FORNARI^{1,2}, A. BARALDI¹, V. MONTEDORO¹, A. PARISINI¹, M. PAVESI¹, M. BOSI², C. FERRARI², E. GOMBIA², D. KLIMM³, F. MEZZADRI⁴, G. CALESTANI⁴, I. CORA⁵, B. PÉCZ⁵, ¹Dept. of Mathematical, Physical and Computer Sciences, University of Parma, Parma, Italy; ²Institute of Electronic and Magnetic Materials (IMEM-CNR), Parma, Italy; ³Leibniz Institute for Crystal Growth (IKZ), Berlin, Germany; ⁴Dept. of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, Italy; ⁵Centre for Energy Research, Hungarian Academy of Sciences, Institute for Technical Physics and Materials Science, Budapest, Hungary
- 9.40 *FJ-2:IL19* **Photosensitive TCO-based Hybrid Materials for Gas Sensor Applications**
M.N. RUMYANTSEVA, A.F. NASRIDINOV, E.V. PAKHOVA, E.V. LUKOVSKAYA, O.A. FEDOROVA, A.M. GASKOV, Moscow State University, Moscow, Russia
- 10.20 *FJ-2:L20* **Use of Electrografted Aryl-layers to Control the Conductivity of ZnO Surfaces**
A.R. McNEILL, A.J. DOWNWARD, **M.W. ALLEN**, University of Canterbury, New Zealand
- 10.50 *FJ-2:L21* **Reactive Dip-coating of Rhombohedral Delafossite CuAlO₂ Based on Mesoporous Alumina Nanofibers**
A. SAFFAR SHAMSHIRGAR¹, M. AGHAYAN¹, T.S. TRIPATHI², M. KARPPINEN², M. GASIK³, I. HUSSAINOVA^{1,4}, ¹Dept. of Mechanical and Industrial Engineering, Tallinn University of Technology, Estonia; ²Dept. of Chemistry, Aalto University, Aalto, Finland; ³School of Chemistry, Material Science and Engineering, AALTO University, Aalto, Finland; ⁴ITMO University, St. Petersburg, Russia
- 11.20 *Break*

Session FJ-3 - Applications

Chair: Roberto FORNARI, Italy

- 11.50 *FJ-3:IL01* **Phonon Engineering on In₂O₃- and ZnO-based Thin Films**
JUNJUN JIA, YUZO SHIGESATO, GRADUATE SCHOOL OF SCIENCE AND ENGINEERING, AOYAMA GAKUIN UNIVERSITY, Sagamihara, Kanagawa, Japan
- 12.30 *FJ-3:L02* **Solution Synthesized Delafossite Nanoparticles for Hole Transport Layer in Organic and Perovskite Solar Cells**
T.B. DAUNIS, JIAN WANG, BOYA ZHANG, D. BARRERA, **JULIA W.P. HSU**, University of Texas at Dallas, Richardson, TX, USA; W. DUNLAP-SHOHL, D. MITZI, Duke University, USA

Room: SPOLETO B

Session FK-6 - Radiation Effects

Chair: Sergei DUDAREV, UK

- 9.00 *FK-6:IL05* **New Conceptual Advances in Diffusion-mediated Modelling of Dislocation-driven Evolution of Radiation Effects in Fission and Fusion Materials**
I. ROVELLI^{1,2}, A.P. SUTTON¹, S.L. DUDAREV², ¹Department of Physics, Imperial College London, London, UK; ²Culham Centre for Fusion Energy, UK Atomic Energy Authority, UK
- 9.30 *FK-6:IL06* **In situ Ion Irradiation Induced Detwinning in Naotwinned Cu Films**
ENGANG FU¹, J.L. DU¹, K.Y. YU², M.M. LI³, M. KIRK³, ¹School of Physics, Peking University, Beijing, China; ²Dept. of Materials Science, Chinese University of Petroleum, Beijing, China; ³Argonne National Laboratory, Argonne, IL, USA
- 10.00 *FK-6:L08* **Behaviour of Spent Nuclear Fuel during Long-term Storage: Accelerated Radiation Damage with ²³⁸Pu-doped UO₂**
E. DE BONA, M. COLOGNA, T. WISS, R.J.M. KONINGS, JRC-Karlsruhe, Eggenstein-Leopoldshafen, Karlsruhe, Germany; G. BALDINOZZI, CentraleSupélec, Gif-sur-Yvette, Paris, France
- 10.20 *FK-6:L09* **Are Mesoporous Silica Radiation Tolerant?**
X. DESCHANELS, Y. LOU, S. DOURDAIN, C. REY, ICSM-UMR5257, CEA/CNRS/UM/ENSCM, Bagnols-sur-Cèze, France
- 10.40 *Break*

Chair: Masashi SHIMADA, USA

- 11.10 *FK-6:IL10* **Effect of Irradiation Defects on SiC Dissolution in Hot Water**
SOSUKE KONDO, YUKI MAEDA, KAZUHIRO FUKAMI, SHINICHIRO MOURI, TATSUYA HINOKI, Kyoto University, Uji, Kyoto, Japan
- 11.40 *FK-6:L12* **Helium Precipitation Study in UO₂ by Transmission Electron Microscopy**
A. MICHEL, G. CARLOT, C. SABATHIER, CEA / DEN / DEC, Saint Paul Lez Durance, France; M. DUMONT, IM2NP, UMR CNRS 7334, Aix-Marseille Université, Marseille, France; M. CABIE, CP2M, Aix-Marseille Université, Marseille, France
- 12.00 *FK-6:L13* **Degradation of Zr Microstructure under Operation as Part of Fuel Assemblies of VVER-type Reactors**
B.A. GUROVICH, E.A. KULESHOVA, **A.S. FROLOV**, D.A. MALTSEV, D.A. ZHURKO, D.V. SAFONOV, E.V. KRIKUN, NRC KI, Moscow, Russia
- 12.20 *FK-6:L14* **Electronic Structure Calculations of Structural, Electronic, Thermodynamic and Defect Properties in Mixed Uranium-plutonium Oxides (U,Pu)O₂**
I.C. NJIFON¹, M. FREYSS¹, R. HAYN², M. BERTOLUS¹, ¹CEA, DEN, DEC, de Cadarache, Saint-Paul-Lez-Durance, France; ²Aix-Marseille Université, IM2NP, Campus Scientifique Saint-Jerôme, Marseille Cedex, France

Room: **MAGIONE A**

Session FL-3 - Photonic Devices with Biological and Bio-inspired Materials

Chair: Mathias KOLLE, USA

9.00 *FL-3:IL10* **Structural Colours in Plants: Mechanisms and Functions**

S. VIGNOLINI, Department of Chemistry, University of Cambridge, Cambridge, UK

9.40 *FL-3:IL11* **Bioabsorbable Polymer Optical Waveguides for Deep-tissue Photomedicine**

S. NIZAMOGLU, Koc University, Istanbul, Turkey

10.20 *Break*

Session FL-4 - Bio-medical Devices with Biological and Bio-inspired Materials

Chair: Sahika INAL, Saudi Arabia

10.50 *FL-4:IL01* **Optoelectronic Cellular Interfaces with Nanocrystalline Organic Semiconductors**

E.D. GLOWACKI, V. DEREK, Laboratory of Organic Electronics, Physics and Electronics Division, Linköping University, Norrköping, Sweden

11.30 *FL-4:IL02* **Photostimulation of Semiconducting Nanoparticles to Control Physiological Functions In Vivo**

M. MOROS¹, M.R. ANTOGNAZZA², C. BOSSIO², G. ONORATO¹, A. BAUDUIN¹, V. MARCHESANO¹, M. ZANGOLI³, A. TINO¹, G. LANZANI², **C. TORTIGLIONE**¹, ¹Istituto di Scienze Applicate e Sistemi Intelligenti "E.Caianiello", CNR, Pozzuoli, Italy; ²Center for Nano Science and Technology@PoliMi, Istituto Italiano di Tecnologia, Italy; ³Istituto per la Sintesi Organica e la Fotoreattività, CNR, Italy

12.10 *FL-4:L03* **Bioengineering Fluorescent Conductive Microfibrils in Vivo**

M. MOROS^{1,2}, F. DI MARIA³, P. DARDANO⁴, M. ZANGOLI³, G. ONORATO², A. BAUDUIN², A. TINO², L. DESTEFANO⁴, G. BARBARELLA³, C. TORTIGLIONE², ¹Aragon Materials Science Institute, CSIC, Zaragoza, Spain; ²Istituto di Scienze Applicate e Sistemi Intelligenti "E.Caianiello", CNR, Napoli, Italy; ³Istituto per la Sintesi Organica e la Fotoreattività, CNR, Bologna, Italy; ⁴Istituto di Microelettronica e Microsistemi, CNR, Napoli, Italy

Room: **ORVIETO A**

Session FM-2 - Resistance Switching (RRAM) and Phase Change (PCM) Memories

Chair: Sabina SPIGA, Italy

- 9.00 *FM-2:IL23* **Random Telegraph Noise in Resistive Switching Memory Devices**
F.M. PUGLISI, University of Modena and Reggio Emilia, Modena, Italy
- 9.30 *FM-2:L24* **Characterization of Low Frequency Noise in Oxygen Engineered Hafnium Oxide-based RRAM Devices**
E. PIROS¹, M. LONSKY², S. PETZOLD¹, S.U. SHARATH¹, E. HILDEBRANDT¹, B. KRAH¹, J. MÜLLER², L. ALFF¹, ¹Technische Universität Darmstadt, Darmstadt, Germany; ²Goethe-Universität Frankfurt, Germany
- 9.50 *FM-2:IL25* **Anionic and Protonic Carriers for Oxide-based Neuromorphic Computing**
J.L.M. RUPP, Electrochemical Materials, Massachusetts Institute of Technology, MIT, USA
- 10.20 *Break*

Session FM-1 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

Chair: Helene BEA, France

- 10.50 *FM-1:IL10* **Negative Capacitance: Theory, Practice and Limitations**
Y.J. KIM, M.H. PARK, **CHEOL SEONG HWANG**, Department of Material Science & Engineering and Inter-University Semiconductor Research Center, Seoul National University, Seoul, South Korea
- 11.20 *FM-1:L02* **Magnetolectric Coupling at Ferromagnet/Ferroelectric-HfO₂ Interface**
A. ZENKEVICH¹, Y. MATVEYEV¹, V. MIKHEEV¹, R. MANTOVAN², A.I. CHUMAKOV³, ¹Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia; ²CNR-IMM Laboratorio MDM, Agrate Brianza (MB), Italy; ³ESRF-The European Synchrotron CS40220, Grenoble Cedex, France
- 11.40 *FM-1:L03* **Effect of Polarization Reversal on the Potential Distribution Across Ferroelectric HfO₂ based Capacitors Revealed in Operando by Hard x-ray Photoemission Spectroscopy**
Y. MATVEYEV, D. NEGROV, V. MIKHEEV, A. CHERNIKOVA, A. ZENKEVICH, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia; A. GLOSKOVSKII, Deutsches Elektronen-Synchrotron, Hamburg, Germany
- 12.00 *FM-1:IL05* **Ultrafast MRAM Strategies for Cache Applications and Beyond**
I.L. PREJBEANU¹, A. TIMOPHEEV¹, M. MIRON¹, G. GAUDIN¹, B. LACOSTE¹, T. DEVOLDER², M. MARINS DE CASTRO¹, R.C. SOUSA¹, L.D. BUDA-PREJBEANU¹, S. AUFFRET¹, U. EBELS¹, B. RODMACQ¹, B. DIENY¹, ¹Univ. Grenoble Alpes, CEA, CNRS, INAC-Spintec, Grenoble, France; ²Univ. Paris-Sud, Orsay, France
- 12.30 *FM-1:IL06* **Sub-ns Current-induced Magnetization Switching Driven by Spin-orbit Torques**
P. GAMBARDILLA, Dept. of Materials, ETH Zürich, Switzerland

Room: **ORVIETO B**

Session FN-4 - Applications

Chair: Sanna ARPIAINEN, Finland

- 9.00 *FN-4:IL07* **Optimization of Gate Oxide for Reliable Diamond Power Transistors**
E. GHEERAERT, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France
- 9.30 *FN-4:IL08* **Graphene-based Micro-supercapacitors by Flash Lamp Technology**
TAEYOUNG KIM, Department of Bionanotechnology, Gachon University, Seongnam, South Korea
- 10.00 *FN-4:IL09* **Carbon Nanofibers as Support for Pt-Catalysts in PEM Fuel Cells**
P.Y. PODLESCHNY, U. ROST, M. BRODMANN, Westphalian University of Applied Sciences, Dortmund, Germany
- 10.30 *FN-4:IL10* **Beyond CMOS Solutions Enabled by Layered Materials**
G. FIORI, Dipartimento Ingegneria dell'Informazione, University of Pisa, Pisa, Italy
- 11.00 *Break*

Chair: TaeYoung KIM, South Korea

- 11.30 *FN-4:IL12* **Applications of Detonation Nanodiamonds: Today and in Future**
A.T. DIDEIKIN, Ioffe Institute, St. Petersburg, Russia
- 12.00 *FN-4:L14* **Black Diamond Technology for Solar Energy Conversion**
A. BELLUCCI¹, M. GIROLAMI¹, M. MASTELLONE¹, S. ORLANDO¹, R. POLINI^{1,2}, **D.M. TRUCCHI**¹, ¹CNR-ISM, Rome, Italy; ²Dept. of Chemical Sciences and Technologies, Univ. di Roma "Tor Vergata", Roma, Italy
- 12.20 *FN-4:L15* **Redox and Magnetically Active Nanoswitches Encapsulated in Hollow Carbon Nanotubes**
M. DEL CARMEN GIMENEZ-LOPEZ, School of Chemistry, University of Nottingham, University Park, Nottingham, UK

Room: **MONTEFALCO**

Session FO-5 - Vortex Lattice Physics

Chair: Maria IAVARONE, USA

- 9.30 *FO-5:IL01* **Anomalous Enhancement of Critical Current Density in Iron-based Superconductors with Splayed Columnar Defects**

TSUYOSHI TAMEGAI, A. PARK, N. ITOH, N. YAMAOKA, S. PYON, Department of Applied Physics, The University of Tokyo, Tokyo, Japan; T. KAMBARA, A. YOSHIDA, Nishina Center, RIKEN, Wako, Saitama, Japan; S. OKAYASU, Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Ibaraki, Japan; A. ICHINOSE, Central Research Institute of Electric Power Industry, Electric Power Engineering Research Laboratory, Yokosuka, Kanagawa, Japan

- 10.00 *FO-5:IL02* **Point-like Defects for Enhanced Flux Pinning in Technical Nb₃Sn Superconductors**

J. BERNARDI, S. PFEIFFER, USTEM, Technische Universität Wien, Wien, Austria; T. BAUMGARTNER, M. EISTERER, Atominstut, Technische Universität Wien, Wien, Austria; L. BOTTURA, C. SCHEUERLEIN, A. BALLARINO, CERN, Geneva, Switzerland

10.30 *Break*

Chair: Tsuyoshi TAMEGAI, Japan

- 11.00 *FO-5:L04* **Nature of the Second Magnetization Peak in Superconducting Single Crystals**

L. MIU, National Institute of Materials Physics, Bucharest-Magurele, Romania

- 11.20 *FO-5:IL05* **STM Studies of Vortices in FeSe Single Crystals**

M. IAVARONE, Department of Physics, Temple University, Philadelphia, PA, USA

Room: **MAGIONE B**

Session FP-4 - Nanomaterials Systems for Bio-imaging and Theranostics

Chair: Thomas WEBSTER, USA

10.00 *FP-4:IL04* **Light-triggered Assembly of Gold Nanoparticles for Tumour Theranostics**

XIAJU CHENG, **HAIBIN SHI**, Soochow University, Suzhou, Jiangsu, China

10.30 *FP-4:L07* **Rational Design of the Nano Bio Interface for Optimal Performance in Nanomedicine**

I. YAROVSKY, P. CHARCHAR, N. TODOROVA, RMIT University, Melbourne Victoria, Australia

10.50 *Break*

Session FP-5 - Clinical Translations in Diagnosis and Therapy, and in Implantable Prostheses and Micro-nano Devices

11.20 *FP-5:IL04* **Nano-ceramics and their Use in Biomaterials, Drug Delivery, Tissue Engineering, and as Novel Antibiotic Agents**

P. GHANNADIAN, **T.J. WEBSTER**, Northeastern University, Department of Chemical Engineering, Boston, MA, USA

11.50 *FP-5:IL07* **Nanoplasmonic Quantification of Tumor-derived Extracellular Vesicles in Plasma Microsamples for Diagnosis and Treatment Monitoring**

K. LIANG, F. LIU, J. FAN, D. SUN, C. LIU, D.W. BERNARD, M.H. KATZ, E. J. KOAY, Z. ZHAO, **TONY Y. HU**, The Biodesign Institute, Arizona State University, Tempe, AZ, USA

Room: **SPELLO**

Session FE-3 - Direct Alcohol Fuel Cells (DAFCs)

Chair: Antonino S. ARICO', Italy

14.30 *FE-3:IL06* **Catalysts with Low Noble Metal Content for Ethanol Electro-oxidation**

N. SHAKIBI NIA, C. RÜDIGER, A. PADUANO, G. GARCÍA, A. MARTUCCI, E. PASTOR, **J. KUNZE-LIEBHÄUSER**, Institut für Physikalische Chemie, Leopold-Franzens-Universität Innsbruck, Innsbruck, Austria; Department of Industrial Engineering, University of Padova, Padua, Italy; Instituto de Materiales y Nanotecnología, Universidad de La Laguna, La Laguna, Spain

15.10 *FE-3:IL07* **Nano-sized Platinum-free Electrocatalysts in Alkaline Direct Alcohol Fuel Cells: Catalyst Design and Principles**

K.I. OZOEMENA, Molecular Sciences Institute, School of Chemistry, University of the Witwatersrand, Johannesburg, South Africa

Room: **SALA RELATORI**

**Session FF-3 - Devices Technologies and Applications
for Thermoelectrics, Thermionics, and
Thermophotovoltaics**

Chair: Yuzuru MIYAZAKI, Japan

14.30 *FF-3:IL10* **Enhancing Solar Energy Conversion by Hybrid
Photovoltaic Thermoelectric Cells**

D. NARDUCCI, Department of Materials Science, University of
Milano Bicocca, Milan, Italy

15.10 *FF-3:IL11* **Power Generation and Durability of Oxide Based
Thermoelectric Module**

RYOJI FUNAHASHI¹, T. URATA¹, Y. MATSUMURA¹, M. SUZUKI¹,
H. MURAKAMI¹, H. IKENISHI¹, T. TAKEUCHI¹, R.O. SUZUKI², S.
SASAKI³, S. SUGIYAMA³, ¹National Institute of Advanced Industrial
Science & Technology, Ikeda, Osaka, Japan; ²Graduate School
of Engineering, Hokkaido University, Japan; ³Akita Industrial
Technology Center, Japan

15.50 *FF-3:IL12* **Integration of Skutterudites in Thermoelectric
Devices**

D. KENFAUI, I. KOGUT, B. LENOIR, C. CANDOLFI, **A. DAUSCHER**,
Institut Jean Lamour, UMR 7198 CNRS, Université de Lorraine,
Campus Artem, Nancy Cedex, France; A. JACQUOT, J. KÖNIG,
Fraunhofer IPM, Freiburg, Germany

Room: SPOLETO A

Session FG-4 - Magnetic Devices and Components for Energy Applications

Chair: Franca ALBERTINI, Italy

- 14.30 *FG-4:IL01* **The Use of Compositionally Graded Films as Model Systems to Study Magnetic Materials for Energy Applications**
N.M. DEMPSEY¹, N.B. DOAN¹, Y. HONG^{1,2}, I. DE MORAES¹, A. DIAS¹, G. GOMEZ¹, V.M.T.S. BARTHEM^{1,3}, M. BONFIM⁴, L. RANNO¹, D. GIVORD^{1,3}, ¹Univ. Grenoble Alpes, CNRS/UGA, Grenoble INP, Institut Néel, Grenoble, France; ²School of Materials Science and Engineering, South China University of Technology, Guangzhou, China; ³Instituto de Física, Universidade Federal do Rio de Janeiro, RJ, Brazil; ⁴DELTA, Universidade Federal do Parana, Curitiba, Brazil
- 15.00 *FG-4:IL02* **Thermomagnetic Energy Generation Based on Magnetic Shape Memory Alloy Films**
M. KOHL, M. GUELTIG, H. OSSMER, Institute of Microstructure Technology (IMT), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany; H. MIKI, M. OHTSUKA, Tohoku University, Sendai, Japan
- 15.30 *FG-4:IL03* **Magnetocaloric Heat Pumps**
C.R.H. BAHL, S. DALL'OLIO, D. ERIKSEN, K. ENGELBRECHT, Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde, Denmark
- 16.00 *FG-4:IL04* **Novel Concept for Caloric Cooling - The Magnetocaloric Heat Pipe**
L. MAIER, T. HESS, **K. BARTHOLOME'**, Fraunhofer Institute for Physical Measurement Techniques IPM, Freiburg, Germany

Room: **BEVAGNA**

Session FI-4 - Device Architectures and System Integration

Chair: Michele MUCCINI, Italy

- 14.30 *FI-4:IL01* **Integration and Process Technology for Flexible OLED Lighting Systems**
C. MAY, Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, Dresden, Germany
- 15.10 *FI-4:IL02* **Small Area Light Module Application, Simulation Modelling and Optimization for Architectural Lighting**
N. TRIVELLIN, LightCube SRL and University of Padova, Padova, Italy; **S. VENK**, OSRAM SPA, Treviso, Italy
- 15.50 *FI-4:IL03* **Micro-Transfer Printing for Display Applications and Interactive Solid State Lighting**
A.J. TRINDADE², **E. RADAUSCHER**¹, **S. BONAFEDE**¹, **D. GOMEZ**¹, **T. MOORE**¹, **C. PREVATTE**¹, **B. RAYMOND**¹, **A. FECIORU**², **K. GHOSAL**¹, **M. MEITL**¹, **C. BOWER**¹, ¹X-Celeprint Inc., USA; ²X-Celeprint Ltd., Cork, Ireland

Room: **CASCIA**

Chair: Andriy ZAKUTAYEV, USA

Session FJ-1 - Fundamentals

- 14.30 *FJ-1:IL02* **Excitonic Effects and Dielectric Screening in Transparent Conducting Oxides**
A. SCHLEIFE, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA

Session FJ-3 - Applications

- 15.10 *FJ-3:IL05* **Transparent Materials for Perovskite (Opto-) electronics**
T. RIEDL, University of Wuppertal, Wuppertal, Germany

15.50 *Break*

- 16.20 *FJ-3:IL06* **Low Damage Sputtering of TCOs for LEDs**
M. MAUTE, Osram Opto Semiconductors GmbH, Regensburg, Germany

- 17.00 *FJ-3:IL07* **Toward Realization of Ga₂O₃ Transistors for Power Electronics Applications**
MAN HOI WONG, Y. NAKATA, C.-H. LIN, National Institute of Information and Communications Technology, Koganei, Tokyo, Japan; K. SASAKI, Tamura Corp., Sayama, Saitama, Japan, and National Institute of Information and Communications Technology, Koganei, Tokyo, Japan; Y. MORIKAWA, Silvaco Japan Co., Ltd., Yokohama, Kanagawa, Japan; K. GOTO, Tamura Corp., Sayama, Saitama, Japan, and Tokyo University of Agriculture and Technology, Koganei, Tokyo, Japan; A. TAKEYAMA, T. MAKINO, T. OHSHIMA, National Institutes for Quantum and Radiological Science and Technology, Takasaki, Gunma, Japan; A. KURAMATA, S. YAMAKOSHI, Tamura Corp., Sayama, Saitama, Japan; H. MURAKAMI, Y. KUMAGAI, Tokyo University of Agriculture and Technology, Koganei, Tokyo, Japan; M. HIGASHIWAKI, National Institute of Information and Communications Technology, Koganei, Tokyo, Japan

Room: **SPOLETO B**

Session FK-7 - Materials Modelling and Database

Chair: Hua-Tay LIN, China

- 14.30 *FK-7:IL02* **A Large Scale Database of Cascade Configurations: A New Paradigm in Multi-scale Modelling of Radiation Damage Effects in Nuclear Materials**
A.E. SAND, University of Helsinki, Helsinki, Finland; S.L. DUDAREV, CCFE, Culham Science Centre, Abingdon, UK
- 15.00 *FK-7:L03* **EUROFER97 Ratcheting Behavior at 450 & 550°C and their Modelling**
KUO ZHANG, JARIR AKTAA, Karlsruhe Institute of Technology (KIT), Institute for Applied Materials, Eggenstein-Leopoldshafen, Germany
- 15.20 *Break*
- 15.50 *FK-7:IL04* **Modelling the Thermophysical and -mechanical Properties of Tungsten Fibre-reinforced Copper Metal Matrix Composites by means of Mean Field Homogenisation**
A. VON MÜLLER, M. LI, R. NEU, J.H. YOU, Max-Planck-Institut für Plasmaphysik, Garching, Germany
- 16.20 *FK-7:IL06* **Structural Steels for DEMO and Fusion Power Plants**
E. GAGANIDZE, C. DETHLOFF, B. KAISER, M. RIETH, J. AKTAA, Karlsruhe Institute of Technology, Institute for Applied Materials (IAM), Eggenstein-Leopoldshafen, Germany

Room: **MAGIONE A**

Session FL-4 - Bio-medical Devices with Biological and Bio-inspired Materials

Chair: Gianluca FARINOLA, Italy

- 14.30 *FL-4:IL06* **Tailoring Conducting Polymer Scaffolds for Bioelectronics**
S. INAL, Biological and Environmental Science and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia
- 15.10 *FL-4:IL07* **Biomimetic Microfluidics based on Stimuli-responsive Soft Polymers**
D. DIAMOND, A. DUNNE, D. BRUEN, C. DELANEY, P. MCCLUSKEY, M. MCCAUL, L. FLOREA, INSIGHT Centre for Data Analytics, National Centre for Sensor Research, Dublin City University, Dublin, Ireland
- 15.50 *FL-4:IL08* **Heat Effect of Nanoparticles for Biotechnological Applications**
J.M. DE LA FUENTE, Institute of Materials Science of Aragón, Zaragoza, Spain

Room: **ORVIETO A**

Session FM-1 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

Chair: Lucian PREJBEANU, France

- 14.30 *FM-1:IL07* **Electric-field Controlled Nucleation of Magnetic Skyrmions at Room Temperature**
T. SRIVASTAVA, M. SCHOTT, A. HALLAL, M. CHSHIEV, S. AUFFRET, C. BARADUC, **H. BEA**, Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP*i*, INAC, SPINTEC, Grenoble, France; M. SCHOTT, A. BERNAND-MANTEL, L. RANNO, V. KRIZAKOVA, S. PIZZINI, D. GIVORD, Institut NEEL/CNRS/UGA-Grenoble/ Grenoble-INP, France
- 15.00 *FM-1:IL11* **Magnetic Polarons in Strongly Correlated Materials for Spintronic Applications**
V.G. STORCHAK, National Research Center "Kurchatov Institute", Moscow, Russia
- 15.30 *FM-1:L12* **Self-assembled Network of Nanostructures in BiFeO₃ Thin Films**
B. COLSON, V. FUENTES, C.FRONTERA, F. SANDIUMENGE, LL. BALCELLS, B. MARTINEZ, A. POMAR, ICMAB-CSIC, Campus UAB, Bellaterra, Spain; D. COLSON, M. VIRET, A. FORGET, SPEC/IRASMIS/DSM, CEA-Saclay, Gif-sur Yvette, France; J. SANTISO, ICN2, CSIC, BIST, Campus UAB, Bellaterra, Spain; **Z. KONSTANTINOVIC**, N. LAZAREVIC, M. SCEPANOVIC, Z.V. POPOVIC, CSSPNM, Institute of Physics Belgrade, University of Belgrade, Serbia

Room: **ORVIETO B**

Session FN-4 - Applications

Chair: Gianluca FIORI, Italy

- 14.30 *FN-4:L16* **Elastocaloric Effect in Carbon Nanotubes and Graphene**
S. LISEKOV, University of South Florida, Tampa, FL, USA
- 14.50 *FN-4:L17* **Ammonia Sensing using Transfer-free in situ CCVD Grown Nanocrystalline Graphene**
D. NOLL, U. SCHWALKE, Institute for Semiconductor Technology and Nanoelectronics, Technische Universität Darmstadt, Darmstadt, Germany
- 15.10 *FN-4:IL19* **Aeronautical Composite Laminate Structure Containing Graphene Related Materials**
C. MERINO, Grupo Antolin Ingeniería, Burgos, Spain; T. BLANCO, A. BUTRAGUEÑO, Airbus Operations, Getafe, Spain; A. REGUERO, Aernnova, Toledo, Spain; **J. LÓPEZ PUENTE**, University Carlos III Madrid, Leganés, Spain

15.40 *Break*

Chair: Artur DIDEIKIN, Russia

- 16.10 *FN-4:IL20* **Graphene-based Neurointerfaces**
M. BRAMINI, F. CESCA, F. BENFENATI, Center for Synaptic Neuroscience and Technologies & Graphene Labs, Istituto Italiano di Tecnologia, Genova, Italy
- 16.40 *FN-4:L21* **Nanoscale Sensing using Color Centers in Diamond**
A. SLABLAB, M. RADTKE, R. NELZ, E. BERNARDI, A. MEYER, O. OPALUCH, M. CHALLIER, E. NEU, Saarland University, Saarbruecken, Germany
- 17.00 *FN-4:IL22* **Graphene Transistors in Biosensing Applications**
S. ARPIAINEN, M. SOIKKELI, H. AROLA, T. NEVANEN, VTT Technical Research Centre of Finland Ltd, VTT, Finland

Room: **MONTEFALCO**

Session FO-7 -Superconductor Applications

Chair: Davor PAVUNA, Switzerland

- 14.30 *FO-7:IL01* **High Temperature Superconductors for Rotating Machinery and Power Applications**
J.L. TALLON, Robinson Research Institute, Victoria University of Wellington, Lower Hutt, New Zealand
- 15.00 *FO-7:IL02* **Superconducting Thin-film Quantum Circuits: Coherence Limits**
A. USTINOV, Karlsruhe Institute of Technology, Karlsruhe, Germany
- 15.30 *FO-7:IL03* **On Progress in Superconducting Electronics**
S. PAGANO^{1,2}, N. MARTUCCIELLO^{2,1}, ¹Physics Department, University of Salerno, Fisciano (SA), Italy; ²C.N.R. SPIN Salerno, Fisciano (SA), Italy
- 16.00 *FO-7:IL04* **Novel Josephson Junctions with Non-zero Ground State Phase**
E. GOLDOBIN, R. MENDITTO, D. KOELLE, R. KLEINER, University of Tübingen, Tübingen, Germany

POSTER DISCUSSION

THURSDAY JUNE 14: 16.30 - 18.30

Posters desmouting:

(Soon after the poster discussion)

FA:P01 Facile Synthesis of Flexible In-plane Graphene Micro-supercapacitor Using Flash Reduction

SEOK HUN KANG, I.G. KIM, B.N. KIM, J.H. SUL, I.K. YOU, Electronics and Telecommunications Research Institute, Daejeon, South Korea

FA:P04 Low-temperature Growth of Wafer-scale Layered MoS₂ by Chemical Vapor Deposition for Flexible Devices

SANG-WOO KANG, JIHUN MUN, CHEGAL WON, Korea Research Institute of Standards and Science (KRISS), Deajeon, South Korea

FA:P05 High Performance Flexible a-IGZO TFTs with Highly Hydroxylated Dielectric Surfaces

YAN SHAO, MEI-NA ZHANG, WEN-JUN LIU, SHI-JIN DING, School of Microelectronics, Fudan University, Shanghai, China

FB:P03 Study of Bismuth Triiodide Nanoparticles Synthesis and their Application in Organic-inorganic Hybrid Bulk-heterojunction Solar Cells

L. BETHENCOURT, M.E. PÉREZ, H.Y. BENTOS PEREIRA, L.R. FORNARO, D. OREGGIONI, Grupo de Desarrollo de Materiales y Estudios Ambientales, Depto de Desarrollo Tecnológico, Centro Universitario Regional del Este, Universidad de la República, Rocha, Rocha, Uruguay; I.M. AGUIAR, M. MOMBRÚ, Grupo de Desarrollo de Materiales y Estudios Ambientales, Área Radioquímica, Facultad de Química, Universidad de la República, Montevideo, Montevideo, Uruguay

FB:P04 Plasmonic Coupling Effects in Metal-based Composites for Photovoltaics

N. BEREZOVSKA, I. DMITRUK, O. YESHCHENKO, V. KOZACHENKO, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; M. DUSHEYKO, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine

FB:P05 2D/3D Mixed Perovskite Solar Cells by Low-pressure Vapor-assisted Solution Process

HUNG-HSIANG YEH¹, YU-HSIEN CHIANG¹, MING-HSIEN LI¹, CHUN-JEN SU², U-SER JENG², **PETER CHEN**¹, ¹Dept. of Photonics, National Cheng Kung University, Tainan, Taiwan; ²National Synchrotron Radiation Research Center, Hsinchu City, Taiwan

FB:P06 Effective Methods for Improving Device Performance of Organic-inorganic Hybrid Perovskite Solar Cells

YANLIANG LIU¹, YONGCHAO MA¹, SUNG HEUM PARK¹, HO SUEB LEE², KIWAN JANG², **JUNG HYUN JEONG**¹, ¹Dept. of Physics, Pukyong National University, Busan, South Korea; ²Dept. of Physics, Changwon National University, Gyeongsangnam-do, South Korea

FB:P07 One-step Sputtering Process for High-efficiency Cu(In,Ga)Se₂ Thin Film Solar Cells

CHIA-HAO HSU, WEI-HAO HO, SHIH-YUAN WEI, CHUNG-HAO CAI, WEI-CHIH HUANG, **CHIH-HUANG LAI**, Department of Materials Science and Engineering, National Tsing Hua University, HsinChu, Taiwan

FC:P01 Beyond Photoelectrochemical Water Splitting

B. MEI, G. MUL, B. SEGER, PCS Group, MESA+ Institute for Nanotechnology, University of Twente, Enschede, Netherlands; Dept. of Physics, Technical University of Denmark, Kgs. Lyngby, Denmark

FC:P02 Intermediate Temperature Electro-reforming (ITER)

M.V. PAGLIARO^{1,2}, M. BELLINI¹, H.A. MILLER¹, W. OBERHAUSER¹, M.G. FOLLIERO^{1,2}, A. MARCHIONNI¹, J. FILIPPI¹, F. VIZZA¹, ¹ICCOM - CNR, Sesto Fiorentino (Firenze), Italy; ²Dipartimento di Chimica, Università degli Studi di Siena, Siena, Italy

FC:P04 Energy Efficient Production of Fuels and Formate by CO₂ Electroreduction on Copper Nanostructures

J. FILIPPI¹, M. BEVILACQUA¹, M. BELLINI¹, M. FOLLIERO^{1,2}, A. MARCHIONNI¹, H.A. MILLER¹, M. PAGLIARO^{1,2}, F. VIZZA¹, ¹ICCOM - CNR, Sesto Fiorentino, FI, Italy; ²Dept. of Biotechnology, Chemistry and Pharmacy, University of Siena, Siena, Italy

FD:P01 Investigating the Effect of the Hydrophobic Block Structure on Durability of Ion Exchange Membranes for Electrochemical Applications

JANG YONG LEE, Korea Research Institute of Chemical Technology, Daejeon, South Korea

FD:P02 Durable Supercapacitor Based on Nanoscale Confinement of Manganese Oxide Nanoparticles in Hollow Carbon Nanostructures

C. HERREROS-LUCAS, A.N. KHLOBYSTOV, M.C. GIMENEZ-LOPEZ, School of Chemistry University of Nottingham, UK; M.W. FAY, Nanoscale and Microscale Research Centre, University of Nottingham, UK

FD:P03 Photoreduction and Enhanced Properties of Graphene Oxide Electrode for Supercapacitor

J.H. SUL, IN GYOO KIM, S.H. KANG, Y.S. YANG, I.K. YOU, Electronics and Telecommunications Research Institute, Daejeon, South Korea

FE:P03 Synthesis of Composites in the Y-doped ABO₃ Perovskite Type Structure - V₂O₅ Systems by Impregnation Method

A. LACZ, E. DROZDZ, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland

FE:P04 Synthesis and Properties of Porous Ni/SrTiO₃/YSZ Composites

E. DROZDZ, A. LACZ, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland

FE:P08 Carbon Monoxide Poisoning Effect on Fuel Cell Performance with Consideration of Cathode Liquid Flooding

KEN-MING YIN, W.-K. XIA, Y.-L. LAI, Chemical Engineering Department, Yuan Ze University, Taoyuan, Taiwan

FF:P01 Optimization in Basic Thermoelectric Properties of n-type Mg₂Si and Improvement in Elemental Durability Issues for Industrialization

TSUTOMU IIDA, T. KODAMA, M. TOKUMURA, H. HAMBBA, T. MANBA, R. HATANAKA, D. SHIOJIRI, K. NISHIO, A. YASUMORI, Y. KOGO, Dept. of Materials Science and Technology, Tokyo University of Science, Tokyo, Japan

FF:P03 Nanostructured Ag₂Te/PEDOT:PSS Hybrid Material for High Performance Thermoelectrics

M. RAJA THULASIMANI^{1,2,3}, K.A. MAZZIO^{1,2}, B. RYLL⁴, D. KOJDA⁴, K. HABICHT^{4,5}, S. RAOUX^{1,2,3}, ¹Institut für Nanospektroskopie, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany; ²Energy Materials In-Situ Lab., Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany; ³Institut für Physik, Humboldt Universität zu Berlin, Berlin, Germany; ⁴Dept. Methods for Characterization of Transport Phenomena in Energy Materials, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany; ⁵Institut für Physik und Astronomie, Universität Potsdam, Potsdam, Germany

FG:P02 The Effect of Zn and Ni Substitution on Magnetic and Microwave Absorbing Properties of Co₂W Hexagonal Ferrites

HAN-SHIN CHO, TIAN LIU, **SUNG-SOO KIM**, Dept. of Advanced Materials Engineering, Chungbuk National University, Cheongju, South Korea

FG:P05 Magnetic and Transport Properties of Superelastic Fe_{43.5}Mn₃₄Al₁₅Ni_{7.5} Heusler Alloys

V. KHOVAYLO¹, M. SEREDINA¹, M. LYANGE¹, A. BOGACH², R. CHATTERJEE³, T. OMORI⁴, R. KAINUMA⁴, ¹National University of Science and Technology "MISIS", Moscow, Russia; ²Prokhorov General Physics Institute, Moscow, Russia; ³Indian Institute of Technology Delhi, New Delhi, India; ⁴Dept. of Materials Science, Graduate School of Engineering, Tohoku University, Sendai, Japan

FG:P06 FRIMAG Project: Development of a Prototype of Magnetocaloric Refrigerator

S. FABBRICI, MIST E-R srl, Bologna, Italy; C. BENNATI, **F. ALBERTINI**, IMEM-CNR, Parma, Italy; M. SOLZI, SMFI Dept., Univ. of Parma, Parma, Italy; F. MELINO, DIN - Alma Mater Studiorum Univ. of Bologna, Bologna, Italy; A. FARINA, Industrial Eng. Dept., University of Parma, Parma, Italy; V. MUSSI, MUSP Consortium, Piacenza, Italy; M. ARDOINO, Democenter-Sipe, Modena, Italy; L. FERRARA, SPIN Applicazioni Magnetiche srl, Piacenza, Italy; E. FORLIN, MBN Nanomaterialia S.p.A., Vascon di Carbonera (TV), Italy; F. POLETTI, Jonix Srl, Bologna, Italy

FG:P07 Comparative Study of the Order-disorder Transition in Different Iron based Alloys with Different Cr Addition

Z. BELAMRI¹, D. HAMANA², ¹Phase Transformations Lab., Univ. Mentouri of Constantine, Constantine, Algeria; ²National Polytechnic School of Constantine, Nouvelle Ville Universitaire Ali Mendjeli, Constantine, Algeria

FH:P01 Synthesis and Characterization of Regenerable Fe₃O₄@TiO₂-Noble Metal Photocatalyst Nanoparticles

KYEOUNG-MI SONG, JIN-SEUNG JUNG, Dept. of Chemistry, Gangneung-Wonju National University, Gangneung, Gangwondo, South Korea

FH:P02 Optimization of Tungsten Anodization in the Presence of H₂O₂ to Obtain Nanostructured WO₃ Photoanodes

R.M. FERNÁNDEZ-DOMENE, R. SÁNCHEZ-TOVAR, B. LUCAS-GRANADOS, J. GARCÍA-ANTÓN, Ingeniería Electroquímica y Corrosión (IEC), Depto de Ingeniería Química y Nuclear, Universitat Politècnica de València, Spain

FH:P03 Plastics and Photocatalysis: A Winner Combination for the Prevention of the Incoming of Plastic Wastes to the Environment

M.C. ARIZA-TARAZONA¹, A. ALVAREZ-MÉNDEZ¹, J.J. RUIZ-VALDÉS¹, C. MUGONI², V. BARBIERI², C. SILIGARDI², E.I. CEDILLO-GONZÁLEZ¹, ¹Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., Mexico; ²Università degli Studi di Modena e Reggio Emilia, Dipartimento di Ingegneria "Enzo Ferrari", Modena, Italy

FI:P02 Photoluminescence of Fullerene C₆₀ Thin Film in Plasmon Coupled "Monolayer of Au Nanoparticles – C₆₀ Film – Al Film" Nanostructure

O. YESHCHENKO, V.V. KOZACHENKO, N.I. BEREZOVSKA, Y.F. LIAKHOV, Physics Dept., Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

FJ:P01 Microstructure and Electric Properties of Transparent Indium Oxide Thin Films Prepared by RF Magnetron Sputtering

TIAN LIU, YONG-SOO JUN, MIN-SUNG KIM, SUNG-SOO KIM, Dept. of Advanced Materials Engineering, Chungbuk National University, Cheongju, South Korea

FJ:P03 Mössbauer Study on the Substitution of Tin Oxide for Iron Oxide in Conductive Barium Iron Vanadate Glass

YUKI FUJITA¹, H. MIYAMOTO¹, T. IZUMI¹, S. MASUDA¹, S. KUBUKI², T. NISHIDA¹, N. OKA¹, ¹Kindai University, Iizuka, Fukuoka, Japan; ²Tokyo Metropolitan University, Hachi-Oji, Tokyo, Japan

FJ:P04 Films of Transparent Conductive Oxides for Nitric Oxide Detection at Low Level

M.V. CHUPRIN, O.M. IVANOVA, S.A. KRUTOVERTSEV, L.S. KRUTOVERTSEVA, A.E. TARASOVA, CJSC "Ecological sensors and systems", Zelenograd, Moscow, Russia

FK:P02 Corrosion Behaviour and Microstructural Stability of Alumina-forming Austenitic Model Alloys Exposed to Oxygen-containing Molten Lead

HAO SHI, A. JIANU, A. WEISENBURGER, S. MIRAN, A. HEINZEL, R. FETZER, L. FABIAN, G. MUELLER, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

FK:P03 Structural State Features of the Base Metal after Recovery Annealing and Long-term Operation within VVER-440 RPV

E.A. KULESHOVA, A.S. FROLOV, D.A. MALTSEV, G.M. ZHUCHKOV, S.A. BUBYAKIN, D.Yu. ERAK, D.A. ZHURKO, S.V. FEDOTOVA, NRC KI, Moscow, Russia

FK:P04 Structural Features of Hydride Phase Formation in E110 Zr-alloy under the Influence of Various Factors

B.A. GUROVICH, E.A. KULESHOVA, A.S. FROLOV, D.A. MALTSEV, O.O. ZABUSOV, D.V. SAFONOV, E.V. KRIKUN, A.S. BRAGIN, NRC KI, Moscow, Russia

FM:P01 TEM of Transrotational Crystals in PZT Films with 10% La

V.Yu. KOLOSOV¹, O.M. ZHIGALINA², D.N. KHMELENIN², A.O. BOKUNIAEVA¹, ¹Ural Federal University, Ekaterinburg, Russia; ²FSRC Crystallography & Photonics RAS, Moscow, Russia

FM:P05 On the Resistive Switching Properties of Random Access Memory Based on Yttria-stabilized Zirconia

S.L. CHAO, J.S. CHERNG, Dept. of Materials Engineering, Ming Chi University of Technology, Taipei, Taiwan

FM:P07 Self-assembly of Metal@Al₂O₃ Core-shell Nanoparticles and Nonvolatile Memory Properties

JONG-HWAN YOON, Dept. of Physics, Kangwon National University, Chuncheon, South Korea

FN:P01 Synthesis and Characterization of Stable and Ordered-packing High Order Acenes

QING WANG, N.L. ARUN, C.Y. CHI, National University of Singapore, Singapore

FN:P02 Functional Nanocomposites with Graphene-DNA Hybrid Complexes: Fabrication and Surface Properties under UV Irradiation

E. TOTO, M.G. SANTONICOLA, Dept. of Chemical Materials and Environmental Eng., Sapienza University of Rome, Rome, Italy; S. LAURENZI, Dept. of Astronautic Electrical and Energy Engineering, Sapienza University of Rome, Rome, Italy

FN:P05 Micro Wires Graphene in Field Effect Transistors Defined by Photolithography Process

A. PASCON^{1,2}, F. RUFINO^{1,3}, D.R. GONZALEZ LARRUDE⁴, J. REZENDE², J. ALEXANDRE DINIZ^{1,3}, ¹Center of Semiconductor Components and Nanotechnologies - Unicamp; ²Sao Francisco University, Campinas; ³School of Electrical and Computer Engineering - Unicamp; ⁴Mackenzie Presbyterian University, SP, Brazil

FN:P06 A Microfabricated Sensor for Detecting Biochemical Markers of Bone Formation

S. SIRIVISOOT, King Mongkut's University of Technology Thonburi, Bangkok, Thailand

FO:P01 Superconducting Properties of a new Oxysulfate Superconductor

HO KEUN LEE, J. KIM, Dept. of Physics, Kangwon National University, Chuncheon, South Korea

FO:P03 Design and Simulation of 4-bit Random Access Memory Composed of Reciprocal Magnetic Flux Quanta

S. NARENDRAN, J. SELVAKUMAR, SRM Institute of Science and Technology, Chennai, Tamil Nadu, India

FP:P01 Development of Gold Nanorod-based SERS tag for Food Safety Monitoring

R. PARDEHKHORRAM¹, YUANHUI ZHENG¹, P. BAKTHAVATHSALAM¹, R. TILLEY¹, NANJU ALICE LEE², J.J. GOODING^{1,3}, University of New South Wales, Sydney, NSW, Australia: ¹School of Chemistry, ²School of Chemical Engineering, ³ARC Centre of Excellence in Convergent Bio-Nano Science and Technology, Sydney, NSW, Australia

FP:P04 Investigation of Optical Properties of Y-TZP for Aesthetic Dental Application: Effect of Oxygen Vacancies

R. SHAHMIRI, O.C. STANDARD, J.N. HART, C.C. SORRELL, School of Materials Science and Engineering, University of New South Wales Sydney, Sydney, Australia

FP:P05 Synthesis of Nanometric TiO₂ and its Application as Bionanomaterial

V. GONZALEZ-TORRES, M.R SÁNCHEZ-DÍAZ, Escuela de Ciencias de la Salud Valle de las Palmas de la Universidad Autónoma de Baja California, Tijuana, Baja California, México; M. ROSALES-AGUILAR, Fac. de Medicina y Psicología de la Universidad Autónoma de Baja California, Tijuana, Baja California México; Ma.E. VILLAFUERTE-CASTREJÓN, Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Ciudad de México, México; E. HERNÁNDEZ-GUEVARA, G.C. DÍAZ-TRUJILLO, Fac. de Ciencias Químicas e Ingeniería de la Universidad Autónoma de Baja California, Tijuana, Baja California, México

FP:P07 Isolation and Imaging of Circulating Tumor Cells

CHIUNG WEN KUO, PEILIN CHEN, Research Center for Applied Sciences, Academia Sinica, Taiwan

FP:P08 Programmable Multiple Capture/Release of Circulating Tumor Cells Using Conducting Polymers

DI-YEN CHUEH, CHIUNG WNE KUO, PEILIN CHEN, Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan

HOT POSTERS

FA:HP06 Ternary Ti-Si-C Alloy Film Formation on GaN and Contact Properties

Y. TAKAHASHI, M. ARAI, M. MAEDA, JWRI, Osaka University, Osaka, Japan

FA:HP07 Cool Plasma Sintering for Turning Printed Copper Particles into Bulk Metal

NAOKI SHIRAKAWA, Flexible Electronics Research Center, AIST, Tsukuba, Japan

FB:HP08 High-performance Fullerene-free Organic Solar Cells based on Small Molecule Donor and Acceptor

SORA OH, WON SUK SHIN, SANG-JIN MOON, CHANG EUN SONG, **SANG KYU LEE**, Korea Research Institute of Chemical Technology, Daejeon, South Korea

FB:HP09 80 μ m Thickness Silicon Wafer Manufacturing by Multi-wire Sawing Process

JOONSOO KIM, BOYUN JANG, SUNHO CHOI, Korea Institute of Energy Research, Daejeon, South Korea

FC:HP06 Effect of Zr and Zr₇Ni₁₀ on Hydrogenation Kinetics of Ti-V-Cr Alloys

V. DIXIT, J. HUOT, IRH, UQTR, Trois-Rivières, Québec, Canada

FC:HP07 Tailoring Hydrogen Activation and Release by Novel Frustrated Lewis Pair Systems

H. KILDAHL, M.C. CORREIA, Maastricht Science Programme, Maastricht University, Maastricht, Netherlands

FC:HP08 Electrochemical Reforming of 1,3-propanediol for Acrylate and Hydrogen Production

M. BELLINI, J. MAHMOUDIAN, M.V. PAGLIARO, W. OBERHAUSER, M. INNOCENTI, F. VIZZA, H.A. MILLER, Istituto di Chimica dei Composti Organometallici ICCOM-CNR, Sesto Fiorentino (FI), Italy

FD:HP06 Comparative Electrochemical Study for MnO_x Phase-variable Composites Derived from MnO₂/GO Templates as for Li-rechargeable Battery Electrodes

JI YOUNG JU, SEULGI JI, SUN SOOK LEE, YONGSEON KIM, WON BIN IM, HA-KYUN JUNG, YONGKU KANG, **SUNGHO CHOI**, Korea Research Institute of Chemical Technology, Energy Materials Center, Daejeon, South Korea

FD:HP07 Comparative Characterization of Catalytic Properties of Ta, Nb, Ni₃Co₂O₇ and Carbon in Sodium-Air Batteries

E. FAKTOROVICH SIMON¹, A. NATAN², D. GOLODNITSKY¹, E. PELED¹, ¹School of Chemistry, Tel Aviv University, Tel Aviv, Israel; ²Dept. of Physics and Electrical Engineering & Electronics, Faculty of Engineering, Tel Aviv University, Tel Aviv, Israel

FD:HP08 Towards Fast Manufacturing of Self-standing Conductive Polymer Layers

F. AHMED, U. AIL, A. GRIMOLDI, T. EDERTH, M. BERGGREN, X. CRISPIN, Lab. of Organic Electronics, Dept. of Science and Technology, Linköping University, Sweden; K. HÅKANSSON, Wallenberg Wood Science Center, KTH Royal Institute of Technology, Stockholm, Sweden

FD:HP09 Morphological Studies of Cellulose-PEDOT:PSS Conducting Paper

D. BELAINEH¹, S. MALTI², A. GRIMOLDI¹, M. MODARRESI¹, L. WÅGBERG², X. CRISPIN¹, M. BERGGREN¹, I. ENGQUIST¹, ¹Lab. of Organic Electronics, Dept. of Science and Technology, Linköping University, Norrköping, Sweden; ²Dept. of Fibre and Polymer Tech., KTH-Royal Institute of Technology, Stockholm, Sweden

FE:HP09 Stability Evaluation of SSC Fibrous Cathode with Embedded SDC Particles for Solid Oxide Fuel Cell

SEWOOK LEE, SANGHO PARK, DONGWOOK SHIN, Division of Materials Science and Engineering, Hanyang University, Seoul, South Korea

FF:HP07 Energy-saving Synthesis of Bi₂Te₃ with Poker Deck Morphology

FEI-HUNG LIN, **CHIA-JYI LIU**, Dept. of Physics, National Changhua University of Education, Changhua, Taiwan

FF:HP08 Facilitated Determination of Local Composition in Inhomogeneous Quasi-binary Material Systems from Backscattered Electron Image Contrast

E. MUELLER^{1,2}, M. YASSERI^{1,2}, N. FARAHI², K. KELM², J. DE BOOR², ¹Institute of Inorganic and Analytical Chemistry, Justus Liebig University of Giessen, Giessen, Germany; ²Institute of Materials Research, German Aerospace Center (DLR), Koeln, Germany

FF:HP09 Influence of Ba²⁺ Doping on Thermoelectric Properties of BiCuSeO Fabricated by Spark Plasma Sintering

KYEONGSOON PARK, DONG HOON KIM, HO YOUNG HONG, GUN WOO JUNG, JOON WOO PI, Sejong University, Seoul, South Korea

FG:HP10 High-temperature- and High Magnetic-field-resistant, Non-volatile Memory in Ni₂MnX (X: Al, Ga, In, Sn, Sb) and Soft Magnetism Fe₂MnX in Heusler Nano-precipitates

A. CAKIR¹, **M. ACET**², ¹Dept. of Metallurgical and Materials Engineering, Mugla Sitki Kocman University, Mugla, Turkey; ²Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany

FJ:HP06 Formation of Tin Sulfide Thin Films and Tin Chalcogenide Nanomaterials Using Novel Tin Single Source Precursors

BO KEUN PARK, SEONG GU KANG, TAEK-MO CHUNG, CHANG GYOUN KIM, Thin Film Materials Research Center, Korea Research Institute of Chemical Technology, Daejeon, South Korea

FK:HP05 Boron Carbide- and MAX phases- based Materials for Nuclear Reactors

T. PRIKHNA¹, **A. KOZYREV**¹, P. BARVITSKYI¹, V. SVERDUN¹, V. MOSHCHIL¹, YU. CHAYKOVSKIY², M. EISTERER³, L. CHIRKO², ¹V. Bakul Institute for Superhard Materials of the National Academy of Sciences of Ukraine (NASU), Kiev, Ukraine; ²Institute for Nuclear Research of the National Academy of Sciences of Ukraine, Kiev, Ukraine; ³Atominstut, TU Wien, Vienna, Austria

FK:HP06 Thermal Expansion and Shrinkage of a Bentonite Clay Measured by Dilatometry under Humid and Dry Conditions

E. POST, NETZSCH Geraetebau GmbH, Selb, Germany

FM:HP10 Nanofilaments at Heat-treated TiO₂ (110) for Memristive Devices and Neuromorphic Applications

M. ROGALA¹, G. BIHLMAYER^{2,3,4}, W. SPEIER⁴, C. RODENBÜCHER^{2,4}, P. DABROWSKI¹, Z. KLUSEK¹, K. SZOT^{2,4,5}, ¹Faculty of Physics and Applied Informatics, University of Lodz, Lodz, Poland; ²Peter Grünberg Institut, Forschungszentrum Jülich, Jülich, Germany; ³Institute for Advanced Simulations, Forschungszentrum Jülich, Jülich, Germany; ⁴JARA- Fundamentals of Future Information Technology, Forschungszentrum Jülich, Jülich, Germany; ⁵Institute of Physics, University of Silesia, Katowice, Poland

FM:HP11 Anodic Titanium Oxides for Resistive Switching Memories

SHAOCHUAN CHEN, S. NOORI, M.P. PEDEFERRI, M. LANZA, **M.V. DIAMANTI**, Politecnico di Milano, Chemistry, Materials and Chemical Engineering "Giulio Natta", Milan, Italy

FN:HP07 Low-density Carbon Nanotube Micro-yarns: Improving Electrical Properties by Mechanical Processes

C.MIRALAEI¹, S. PAILHÈS¹, H. LE POCHÉ², R. DEBORD¹, S. LE FLOCH¹, A. SAN-MIGUEL¹, J. DIJON², **V. PISCHEDDA**¹, ¹Institut Lumière Matière (ILM), Université Claude Bernard Lyon 1 and CNRS, Villeurbanne, France; ²CEA Liten, Grenoble, France

FN:HP08 Recyclable Catalytic Nanoreactors by Magnetic Means

M. AYGUN¹, T.W. CHAMBERLAIN², M. DEL CARMEN GIMENEZ-LOPEZ¹, A.N. KHLOBYSTOV³, ¹Centro Singular de Investigación en Química Biolóxica e Materiais Moleculares (CIQUS), Universidade de Santiago de Compostela, Santiago de Compostela, Spain; ²Institute of Process Research and Development, School of Chemistry, University of Leeds, Leeds, UK; ³Nanoscale & Microscale Research Centre, University of Nottingham, University Park, Nottingham, UK

FO:HP04 Optical Evidence on the Unconventional Superconductivity in Ca₈.35La_{1.65}(Pt₃As₈)(Fe₂As₂)₅ Single Crystal

YONG SEUNG KWON, YU-IL SEO, WOO-JAE CHOI, DGIST, Emerging Materials Science, Daegu, Korea

FO:HP05 Thermal Relaxation Time of Superconducting NbTi Strips deduced from the Nucleation Time of Current-induced Hot Spots

K. HARRABI¹, A. MEKKI¹, N. MAALÉJ¹, K. GASMI¹, J.P. MANÉVAL², ¹Physics Department, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia; ²Laboratoire de Physique LPA, Ecole Normale Supérieure, Paris, France

FO:HP06 Superconductivity in Pressurized CeRhGe₃ and Related Noncentrosymmetric Compounds

HONGHONG WANG^{1,3}, JING GUO¹, E.D. BAUER², V.A. SIDOROV⁴, HENGCAN ZHAO^{1,3}, JIAHAO ZHANG^{1,3}, YAZHOU ZHOU¹, ZHE WANG^{1,3}, SHU CAI^{1,3}, KE YANG⁵, AIGUO LI⁵, XIAODONG LI⁶, YANCHUN LI⁶, PEIJIE SUN¹, YI-FENG YANG^{1,3}, QI WU¹, TAO XIANG^{1,3}, J.D. THOMPSON², LILING SUN^{1,3}, ¹Institute of Physics, National Lab. for Condensed Matter Physics, CAS, Beijing, China; ²Los Alamos National Laboratory, MS K764, Los Alamos, NM, USA; ³University of Chinese Academy of Sciences, Beijing, China; ⁴Institute for High Pressure Physics, RAS, Troitsk, Moscow, Russia; ⁵Shanghai Synchrotron Radiation Facilities, Shanghai Institute of Applied Physics, CAS, Shanghai, China; ⁶Institute of High Energy Physics, CAS, Beijing, China

FO:HP07 Fabrication of Y₁Ba₂Cu₃O_{7-δ} Films using Trifluoroacetates on SrTiO₃ and YSZ Substrates

A. BUSTAMANTE DOMINGUEZ¹, L. DE LOS SANTOS VALLADARES^{2,3}, A. M. OSORIO ANAYA⁴, H. SANCHEZ CORNEJO¹, J. FLORES SANTIBAÑEZ¹, L. SANCHEZ SOVERO¹, C.H. BARNES², ¹Lab. de Cerámicos y Nanomateriales, Facultad de Ciencias Físicas, Universidad Nacional Mayor de San Marcos, Lima, Perú; ²Cavendish Lab., Dept. of Physics, University of Cambridge, Cambridge, UK; ³School of Materials Science and Engineering, Northeastern University, Heping District, Shenyang, China; ⁴Lab. de Nanotecnología e Innovación Tecnológica, Fac. de Química e Ingeniería Química, Universidad Nacional Mayor de San Marcos, Lima, Perú

FP:HP11 αTCP Based Bone Cements with Silver-doped Hydroxyapatite and CaCO₃

A. SLOSARCZYK, D. SIEK, A. ZIMA, AGH-University of Science and Technology, Krakow, Poland

FP:HP12 The Microconcrete Type Bone Implant Materials on the Basis of Calcium Phosphates and Chitosan

A. ZIMA, A. SLOSARCZYK, E. CICHON, J. CZECHOWSKA, AGH-University of Science and Technology, Krakow, Poland

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

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 INFORMATION

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.

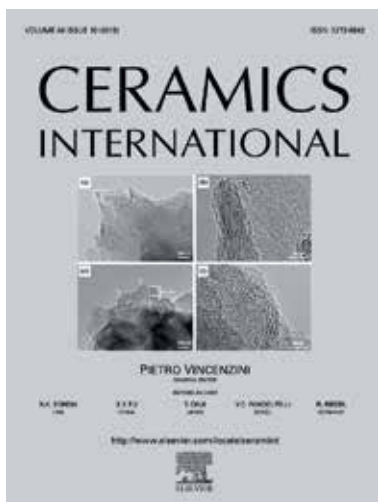
Symposia CM and CN, and Focused Sessions CB-9 and CB-10

All contributions can to 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



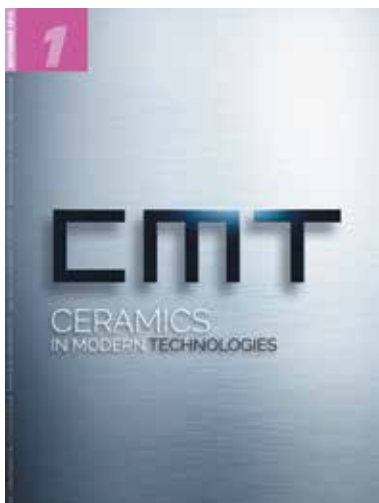
Ceramics International is particularly keen to attract papers which deal with fundamental scientific aspects that are relevant to the development of the whole range of advanced ceramics including e.g. phase equilibria and transformations, reactivity, transport processes, thermodynamic and electronic 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

*Monday June 11
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 flourished 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

Wednesday June 13

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 Bianca Barsanti; *Tenors* Simone Frediani and Simone Mugnaini. *Master conductor*: Andrea Colombini.

The programme will include pieces by: G. Bizet, W.A. Mozart, G. Puccini, J. Strauss, R. Leoncavallo and J. Offenbach.



Entrance ticket for non-registered companions: 30.00 EUR (subjected to place availability)

Conference Dinner

Chiostro di Santa Giuliana

Thursday June 14
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

Monday June 11, 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
- Medioeval 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

Tuesday June 12, full day
9.30 - 19.00

Spoletto, (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



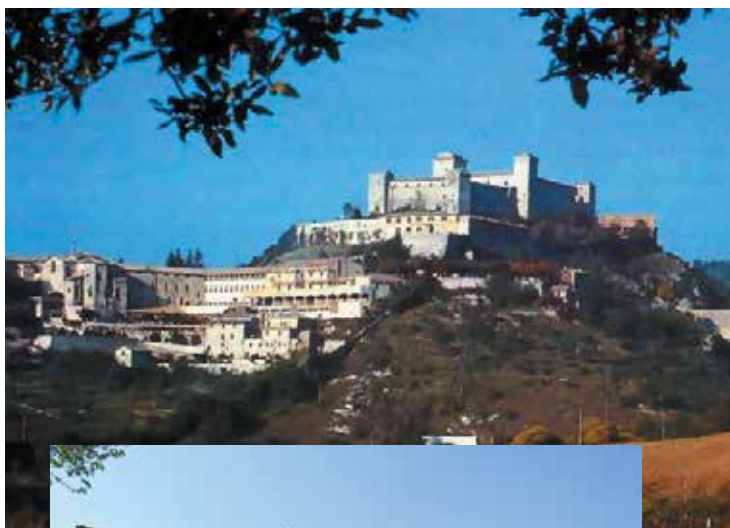
and Lombard, medieval town contended between the Pope and the Emperor, between Guelfs and Ghibellines, cultural centre during the Renaissance and Bishop seat, the history of the City has left an exceptional architectonic and art cultural heritage within a splendid naturalistic context. The Acquedotto 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 and 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

Wednesday June 13, 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 (Medioeval Town Hall)
- Palazzo Cruciali (Cruciali Palace)
- Belvedere (panoramic viewpoint)
- Porta Venere con Torri di Propezio (Venere Gate and Propezio 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

Thursday June 14, 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.

Conference Hotels

1. Best Western Hotel Quattrotorri
CONGRESS CENTER
2. Relais Olmo
3. Perugino
4. Meridiana
5. Etruscan
6. Grifone
7. Sangallo
8. Brufani
9. Ilgo
10. Teatro Morlacchi
(Jazz Concert)
11. Chiostro S. Giuliana
(Welcome Reception)
12. Saint Peter Monastery
13. Central Railway Station
14. Ellera Railway Station
15. Piazza Partigiani
Bus Transfer to/from Congress Center





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