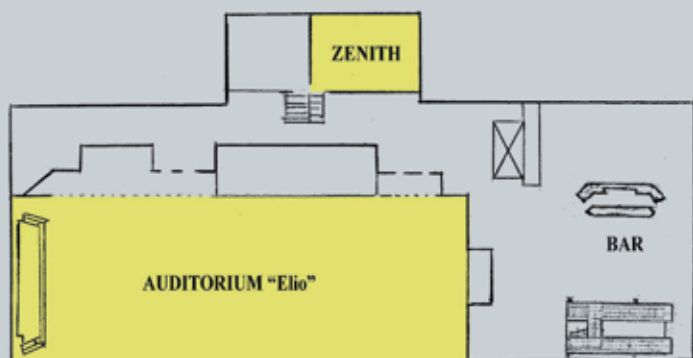


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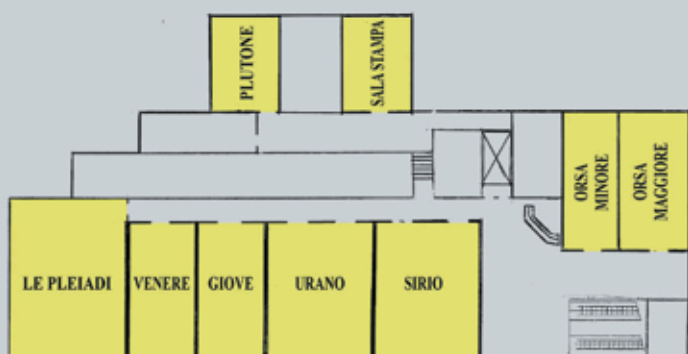
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PALAZZO DEI CONGRESSI

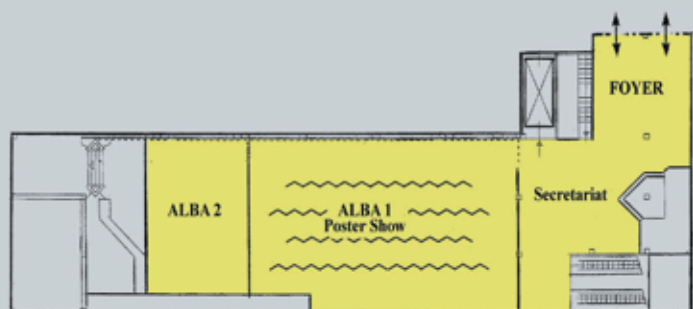
Via Amendola, 2



2nd FLOOR



1st FLOOR



GROUND FLOOR

CROCE DI MALTA

Congress Centre Hotel Croce di Malta

Viale IV Novembre, 18



TAMERICI & PRINCIPE

Congress Centre Hotel Tamerici & Principe

Viale IV Novembre, 2/b



FORUM OUTLINE

SYMPOSIUM **FA**

Fuel Cells: Materials and Technology Challenges

SYMPOSIUM **FB**

Hydrogen Production and Storage

SYMPOSIUM **FC**

Electrochemical Energy Storage Systems: the
Next Evolution

SYMPOSIUM **FD**

Advances in Materials and Technologies for
Efficient Direct Thermal-to-Electrical
Energy Conversion

SYMPOSIUM **FE**

Advances in Photocatalytic Materials for Energy
and Environmental Sustainability

SYMPOSIUM **FF**

Magnetic Materials for Energy

SYMPOSIUM **FG**

Photovoltaic Solar Energy Conversion:
Silicon and Beyond

SYMPOSIUM **FH**

Recent Developments in the Research and
Application of Transparent Conducting and
Semiconducting Oxides

SYMPOSIUM **FI**

Materials and Technologies for Solid State
Lighting

SYMPOSIUM **FJ**

Materials Challenges for Future Nuclear Fission
and Fusion Technologies

Special Session **FJ-10**

*Materials Technology for Nuclear Waste Treatment and
Disposal*

Serial Conferences

FK

5th International Conference

Novel Functional Carbon Nanomaterials

FL

4th International Conference

Mass, Charge and Spin Transport in Inorganic
Materials: Fundamentals to Devices

FM

International Conference

Novel Non-volatile Inorganic Memory Devices:
materials, concepts and applications

FN

7th International Conference

Science and Engineering of Novel
Superconductors

FO

10th International Conference

Medical Applications of Novel Biomaterials and
Nano-biotechnology

Special Session **FO-8**

Smart Polymers for Biomedical Applications

Special Session **FO-9**

*Wearable and Implantable Sensors and Body Sensor
Networks*

Symposia held at “PALAZZO DEI CONGRESSI”

Via Amendola 2

**Symposium FA
Fuel Cells : Materials and Technology Challenges**

**Symposium FB
Hydrogen Production and Storage**

**Symposium FC
Electrochemical Energy Storage Systems: the Next Evolution**

**Symposium FD
Advances in Materials and Technologies for Efficient Direct
Thermal-to-Electrical Energy Conversion**

**Symposium FE
Advances in Photocatalytic Materials for Energy and
Environmental Sustainability**

**Symposium FG
Photovoltaic Solar Energy Conversion: Silicon and Beyond**

**Symposium FH
Recent Developments in the Research and Application of
Transparent Conducting and Semiconducting Oxides**

**Symposium FI
Materials and Technologies for Solid State Lighting**

**FK - 5th International Conference
Novel Functional Carbon Nanomaterials**

**FM - International Conference
Novel Non-volatile Inorganic Memory Devices: materials,
concepts and applications**

**FO - 10th International Conference
Medical Applications of Novel Biomaterials and Nano-
biotechnology**

**Special Session FO-8
Smart Polymers for Biomedical Applications**

Symposia held at “HOTEL CROCE DI MALTA”

Viale 4 Novembre 15

2 min walking distance from the “Palazzo dei Congressi”

**Symposium FJ
Materials Challenges for Future Nuclear Fission and Fusion
Technologies**

**Special Session FJ-10
Materials Technology for Nuclear Waste Treatment and Disposal**

**FL - 4th International Conference
Mass, Charge and Spin Transport in Inorganic Materials:
Fundamentals to Devices**

**Special Session FO-9
Wearable and Implantable Sensors and Body Sensor Networks**

Symposia held at “HOTEL TAMERICI & PRINCIPE”

Viale 4 Novembre 2B

2 min walking distance from the “Palazzo dei Congressi”

**Symposium FF
Magnetic Materials for Energy**

**FN - 7th International Conference
Science and Engineering of Novel Superconductors**

Events by Day

Sunday June 15

11.00-13.00 15.00-19.00

REGISTRATION
Palazzo dei Congressi
Via Amendola, 2
Montecatini Terme, Pistoia, Italy

15.00-19.00
POSTER MOUNTING

Monday June 16

Morning: 9.30-13.00

Opening Session
Welcome Addresses

Plenary Lectures (C:PL1-PL3)

8.30-13.00
POSTER MOUNTING

Monday June 16

Afternoon: 15.00-19.30

Symposium FA	(FA-1:IL01-IL03); (FA-2:IL01-L04)
Symposium FB	(FB-1:IL01-IL04); (FB-2.1:IL01-L05)
Symposium FC	(FC-1:IL01-L04); (FC-1:IL06-L09)
Symposium FD	(FD-1:IL01-IL03); (FD-1:IL04-L06)
Symposium FE	(FE-1:IL01-L04); (FE-1:IL05-L07)
Symposium FF	(FF-1:IL01-IL04); (FF-1:L05-IL07)
Symposium FG	(FG-1:IL01-L03); (FG-2:IL01-L04)
Symposium FH	(FH-1:IL01-IL03); (FH-1:IL04-IL06); (FH-2:IL06)
Symposium FJ	(FJ-1:IL02-IL03); (FJ-3:IL01-IL04)
Conference FK	(FK-1:IL01-IL04); (FK-1:IL05-IL08)
Conference FL	(FL-1:IL01-IL04); (FL-1:IL05-IL07)
Conference FM	(FM-2:IL01-L03); (FM-2:IL06-L08)
Conference FN	(FN-1:IL01-L04); (FN-1:IL05-L07)
Conference FO	(FO-1:IL01-IL03); (FO-1:IL04-IL07)

15.00-19.00

POSTER MOUNTING

20.30 - 22.30 <i>Welcome Party</i>

Tuesday June 17

Morning: 8.30-13.00

Symposium FA	(FA-1:IL04-L09); (FA-3:IL01-IL02)
Symposium FB	(FB-2.4:IL01-L04); (FB-2.1:IL06-L11)
Symposium FC	(FC-1:IL10-L14); (FC-1:IL15-L19+IL25)
Symposium FD	(FD-2:IL01-IL05); (FD-2:IL06-IL08)
Symposium FE	(FE-1:IL09-L12); (FE-2:IL01-L05)
Symposium FF	(FF-1:IL08-L14); (FF-2:IL01-L03)
Symposium FG	(FG-2:IL05-IL06); (FG-3:IL02-IL04)
Symposium FH	(FH-2:IL01-IL04); (FH-2:IL05-L09)
Symposium FJ	(FJ-2:IL01-L06); (FJ-5:IL01-L03)
Conference FK	(FK-1:IL09-IL11); (FK-2:IL01-IL05)
Conference FL	(FL-1:IL08-IL11); (FL-3:IL01-L04)
Conference FN	(FN-2:IL01-IL05); (FN-2:IL06-L08)
Conference FO	(FO-1:IL08-L11); (FO-1:L15-L19)

Afternoon: 15.00-19.30

Symposium FA	(FA-2:IL05-IL07); (FA-2:IL08-L11)
Symposium FB	(FB-1:IL06-L10); (FB-2.2:IL01-L03)
Symposium FC	(FC-1:IL21-IL24); (FC-1:L26-L28b)
Symposium FD	(FD-2:IL09-IL10); (FD-2:IL13-L16)
Symposium FF	(FF-2:IL04-L09); (FF-3:IL01-L04)
Symposium FG	(FG-3:IL05-L08); (FG-3:IL10-L12)
Symposium FH	(FH-2:IL10-L14); (FH-1:IL07-L09)
Symposium FJ	(FJ-1:L05-L08); (FJ-4:IL01-L04)
Conference FK	(FK-2:IL06-L13); (FK-1:L12-L15)
Conference FL	(FL-1:IL12-L16); (FL-1:IL17-L20)
Conference FM	(FM-2:IL09-L11); (FM-3:IL02-IL04); (FM-4:IL02)
Conference FN	(FN-3:IL01-IL03); (FN-4:IL01-IL02); (FN-1:IL08)
Conference FO	(FO-2:IL01-L03); (FO-2:L05-IL08) (FO-4:IL02-IL03) (FO-8.1:IL01-L04); (FO-8.1:IL05-L08)

Wednesday June 18

Morning: 8.30-13.00

Symposium FA	(FA-1:IL10-L12); (FA-2:IL14-L18)
Symposium FB	(FB-2.2:IL04-IL07); (FB-2.3:IL01-L03)
Symposium FC	(FC-1:IL29-L31); (FC-2:IL01-L05)
Symposium FD	(FD-2:IL17-L21); (FD-3:IL01-IL04)
Symposium FE	(FE-2:IL06-L10); (FE-3:IL01-IL03)
Symposium FF	(FF-3:IL05-L09); (FF-3:L10-L15)
Symposium FI	(FI-1:IL09+IL01-IL04); (FI-1:IL05-IL07)
Symposium FJ	(FJ-5:IL04-L08); (FJ-6:IL01-L04)
Conference FK	(FK-3:IL01-IL08); (FK-3:IL09-IL12)
Conference FL	(FL-2:IL01-IL03)
Conference FM	(FM-1:IL05-IL07); (FM-3:IL05-L09)
Conference FN	(FN-3:IL06-L09); (FN-4:IL03-IL06)
Conference FO	(FO-3:IL01-L06); (FO-5:IL02-L07) (FO-8.2:IL01-L05); (FO-8.3:IL01-L05) (FO-8.4:IL02) (FO-9.1:IL02); (FO-9.2:IL02-L05)

Afternoon: 15.00-19.30

Symposium FA	(FA-2:IL19-L22); (FA-2:IL03+IL24-L25)
Symposium FB	(FB: COST ACTION)
Symposium FE	(FE-1:L14-L18); (FE-1:L20-L23)
Symposium FF	(FF-3:L16-IL20); (FF-3:IL21-L24)
Symposium FG	(FG-3:IL14-L17); (FG-4:IL01-IL04)
Symposium FH	(FH-2:IL15-L19); (FH-1:IL11-L13)
Symposium FI	(FI-2:IL01-IL03); (FI-1:IL08-L13)
Symposium FJ	(FJ-7:IL01-L03) (FJ-10.1:IL01-IL04); (FJ-10.4:IL01-IL04)
Conference FK	(FK-4:L13-L16); (FK-4:L18-L23)
Conference FL	(FL-3:IL05-IL08)
Conference FM	(FM-1:IL08-L11); (FM-1:L11b-L15)
Conference FN	(FN-5:IL01-IL03); (FN-6:IL02-L04)
Conference FO	(FO-4:L05-L09); (FO-7:IL01-L04) (FO-8.4:IL01-L05); (FO-8.4:IL06-L09) (FO-9.3:IL01-L03); (FO-9.3:L04-L07)

21.30-23.00
Gala Concert

Thursday June 19

Morning: 8.30-13.00

Symposium FA	(FA-4:IL01-L03); (FA-4:IL05-L11)
Symposium FB	(FB-2.4:IL05-IL08); (FB-2.5:IL01-L05)
Symposium FC	(FC-1:IL33-L34); (FC-2:IL07-IL08)
Symposium FD	(FD-2:IL22-L25); (FD-3:IL05-L09)
Symposium FE	(FE-3:IL05-L08); (FE-3:L09-L11)
Symposium FF	(FF-4:IL02-L08)
Symposium FH	(FH-3:IL01-IL04); (FH-3:IL06-L08)
Symposium FI	(FI-2:IL04-L07); (FI-3:IL01-L04)
Symposium FJ	(FJ-6:IL06-L08); (FJ-7:IL04-IL06); (FJ-2:L06b) (FJ-10.1:L05-L07); (FJ-10.2:IL01-IL05)
Conference FK	(FK-4:IL02-IL05); (FK-4:IL06-IL08)
Conference FM	(FM-1:IL01-IL04); (FM-4:IL01-IL06)
Conference FN	(FN-6:IL05-L07); (FN-7:IL02-L06)
Conference FO	(FO-5:IL01+IL08-IL10); (FO-6:IL01-L04) (FO-8.5:IL01-L04) (FO-9.4:IL02-L04); (FO-9.5:IL02-IL04) (FO-9.2:IL01)

Afternoon: 15.00-18.30

Symposium FA	(FA-4:IL12-L16)
Symposium FB	(FB-2.5:IL06-L10)
Symposium FC	(FC-2:IL09-L12)
Symposium FE	(FE-3:IL12-IL14)
Symposium FI	(FI-3:IL05-L08)
Symposium FJ	(FJ-8:IL01-IL03) (FJ-10.3:IL01-IL04)
Conference FK	(FK-4:IL09-IL12)
Conference FM	(FM-4:IL07-IL09) (FM-3:IL01)
Conference FN	(FN-7:IL08-IL11)
Conference FO	(FO-6:IL05-IL07) (FO-8.6:IL01-IL04)

16.30-18.30

POSTER DISCUSSION

All Posters

20.00-23.30

Conference Dinner

SESSIONS FLOWSHEET

June 16-19

6th Forum on New Materials

Chair

Pietro Vincenzini

World Academy of Ceramics
National Research Council, Italy

Co-Chair

Robert P.H. Chang

International Union of Materials Research Societies
Northwestern University, USA

Programme Chairs

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

Symposium FB: **Amelia Montone**, Italy

Symposium FC: **Arumugam Manthiram**, USA

Symposium FD: **Lidong Chen**, China

Symposium FE: **Gabriele Centi**, Italy

Symposium FF: **Franca Albertini**, Italy

Symposium FG: **Gianluca Farinola / Massimo Mazzer**, Italy

Symposium FH: **John D. Perkins**, USA

Symposium FI: **Giancarlo Righini**, Italy

Symposium FJ: **Hua-Tay Lin**, USA

Special Session FJ-10: **Kevin Fox**, USA

Conference FK: **Yury Gogotsi**, USA

Conference FL: **Han-Il Yoo**, Korea

Conference FM: **Sabina Spiga**, Italy

Conference FN: **Davor Pavuna**, Switzerland

Conference FO: **Aldo R. Boccaccini**, Germany

Special Session FO-8: **Andreas Lendlein**, Germany

Special Session FO-9: **Danilo De Rossi**, Italy

OPENING SESSION

AUDITORIUM

Chair:

Thomas WEBSTER, USA

9.45 - 10.15

Welcome Addresses

Pietro VINCENZINI

General Chair CIMTEC Conferences

Roberto ZAMBONI

Director Institute of Organic Synthesis and Photoreactivity
(ISOF), National Research Council (CNR), Italy

Marco VITTORI ANTISARI

Chief "Materials Technology Department", ENEA - Italian
National Agency for New Technologies, Energy and
Sustainable Economic Development, Italy

Robert P.H. CHANG

General Secretary

International Union of Materials Research Societies
(*video message*)

Plenary Lectures

10.30 - 11.15

F:PL1

Plasma-based Materials Engineering and Surface Modification **P.K. CHU**

Department of Physics and Materials Science, City University of
Hong Kong, Kowloon, Hong Kong, China

11.15 - 12.00

F:PL2

Nanoscale Engineering – Challenges and Opportunities **P.M. AJAYAN**

Department of Materials Science and Engineering, Rice
University, Houston, TX, USA

12.00 - 12.45

F:PL3

Nanomaterials for Biomedical Applications **L. DE COLA**

Institute de Science et d'Ingénierie Supramoléculaires (I.S.I.S.),
Université de Strasbourg, France, and KIT, Germany

Session FA-1 - Solid Oxide (SOFCs) and Molten Carbonate (MCFCs) Fuel Cells

Room: **AUDITORIUM**

Chair: **A.S. ARICO'**, Italy (*Programme Chair*)

15.30 *Welcome*

15.40 *FA-1:IL01* **New Generation Solid Oxide Fuel Cells**
N. CHRISTIANSEN, Topsoe Fuel Cell A/S, Lyngby, Denmark

16.10 *FA-1:IL02* **High Temperature Fuel Cell Electrodes: New Compositions, Microstructures and Systems for Efficient Utilisation of Renewable Fuels**
J.T.S. IRVINE, University of St. Andrews, St. Andrews, UK

16.40 *FA-1:IL03* **Improvement of Durability of SOFC: Origin of Polarization at Cathode/Electrolyte Interfaces**
T. HORITA, N. MINA, H. KISHIMOTO, K. YAMAJI, H. YOKOKAWA, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

17.10 *Break*

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

Chair: **A. FRIEDRICH**, Germany

17.40 *FA-2:IL01* **Activity and Durability of PEFCs Alloy Core-shell Catalysts: Role of Surface Oxidation**
P.B. BALBUENA, **G. RAMOS-SANCHEZ**, Texas A&M University, College Station, TX, USA; **F. GODINEZ**, **O. SOLORZA-FERIA**, Centro de Investigacion y Estudios Avanzados de Instituto Politecnico Nacional, Mexico, D.F., Mexico

18.10 *FA-2:IL02* **New Fuel Cell Electrocatalysts from South Africa - Variations of the Support and the Catalyst Composition**
O. CONRAD, HySA/Catalysis, University of Cape Town, Cape Town, South Africa

18.40 *FA-2:L04* **Nitrogen-free Non-precious Metal Catalyst for Oxygen Reduction based on Iron Carbide Nanoparticles Confined in Curved Carbon Nanotubes**
QINGFENG LI, **YANG HU**, **J.O. JENSEN**, **WEI ZHANG**, **L.N. CL-EEMANN**, **N.J. BJERRUM**, Department of Energy Conversion and Storage, Technical University of Denmark, Kgs. Lyngby, Denmark

Session FB-1 - Hydrogen Production

Room: **LE PLEIADI**

Chair: **A. MONTONE**, Italy (*Programme Chair*)

15.00 *Welcome*

15.10 *FB-1:IL01* **Solar Fuels from H₂O and CO₂ via Thermochemical Redox Cycles**

M.E. GALVEZ, P. FURLER, D. MARXER, J. SCHEFFE, M. GORBAR, U. VOGT, **A. STEINFELD**, Department of Mechanical and Process Engineering, ETH Zurich, Zurich, Switzerland; Laboratory for Hydrogen & Energy, Empa, Dübendorf, Switzerland; Solar Technology Laboratory, Paul Scherrer Institute, Villigen PSI, Switzerland

15.40 *FB-1:IL02* **Solar Thermochemical Water Splitting: Advances in Materials and Methods**

A.H. McDANIEL, M.D. ALLENDORF, Sandia National Labs, Livermore, CA, USA; I. ERMANOSKI, A. AMBROSINI, E.N. COKER, J.E. MILLER, Sandia National Labs, Albuquerque, NM, USA; W.C. CHUEH, Stanford University, Palo Alto, CA, USA; R. O'HAYRE, J. TONG, Colorado School of Mines, CO, USA

16.10 *FB-1:IL03* **Hydrogen Production via Thermochemical Water-splitting by Alkali Metal Cycle**

H. MIYAOKA¹, T. ICHIKAWA², Y. KOJIMA², ¹Institute for Sustainable Sciences and Development, Hiroshima University, Higashi-Hiroshima, Japan; ²Institute for Advanced Materials Research, Hiroshima University, Higashi-Hiroshima, Japan

16.40 *FB-1:IL04* **Solar Fuels from Thermochemical Gas Splitting**

B. MEREDIG, A. EMERY, H. HANSEN, **C. WOLVERTON**, Northwestern University, Evanston, IL, USA

17.10 *Break*

Sub-Session FB-2.1 - Metal Hydrides

Chair: **G.S. WALKER**, UK

17.40 *FB-2.1:IL01* **Transition from Metal Hydrides to Complex Hydrides**

SHIN-ICHI ORIMO, WPI Advanced Institute for Materials Research (WPI-AIMR) / Institute for Materials Research (IMR), Tohoku University, Sendai, Japan

18.10 *FB-2.1:L04* **Hydrogen Storage of Nanocrystalline Mg-Ni alloy Processed by Equal-channel Angular Pressing and Cold Rolling**

A. REVESZ, Dept. Mater. Physics, Eötvös University, Budapest, Hungary

18.30 *FB-2.1:L05* **Size Reduction in Mg and Mg Rich Intermetallics for Hydrogen Storage**

A. AYDINLI¹, **B. AKTEKIN**¹, S. TAN², G. ÇAKMAK³, T. ÖZTÜRK¹, ¹Middle East Technical University, Ankara; ²Akdeniz University, Antalya; ³Bulent Ecevit University, Zonguldak, Turkey

Session FC-1 - Batteries

Room: **GIOVE**

Chair: A. MANTHIRAM, USA (*Programme Chair*)

15.00 *Welcome*

15.10 *FC-1:IL01* **Multinuclear Solid State NMR Studies of Lithium Battery Materials**

S.G. GREENBAUM, Hunter College of the City University of New York, New York, NY, USA

15.40 *FC-1:IL02* **Study of New Active Materials for Rechargeable Sodium-ion Battery**

H. IBA, S. NAKANISHI, Battery Research Division, Toyota Motor Corporation, Susono, Shizuoka, Japan

16.10 *FC-1:L03* **Understanding and Predicting Organic Electrode Materials of Rechargeable Lithium Batteries via Computational Approaches: The New Deal**

C. FRAYRET¹, D. TOMERINI¹, C. GATTI², Y. DANTEN³, M. BECUWE¹, F. DOLHEM⁴, P. POIZOT⁵, ¹LRCS-CNRS UMR 7314, Université de Picardie, Amiens, France; ²CNR-ISTM, Istituto di Scienze e Tecnologie Molecolari, Milano, Italy; ³ISM-CNRS UMR 5255, Talence, France; ⁴LG-CNRS-FRE 3517, Université de Picardie, Amiens, France; ⁵IMN-CNRS UMR_C 6502, Université de Nantes, Nantes, France

16.30 *FC-1:L04* **Fundamental Study of Storage Material for High-temperature Rechargeable Oxide Batteries (ROB)**

O. TOKARIEV, C.M. BERGER, P. ORZESSEK, L. NIEWOLAK, M. BRAM, W.J. QUADAKKERS, N.H. MENZLER, H.P. BUCHKREMER, Institute of Energy and Climate Research (IEK-1), Forschungszentrum Juelich GmbH, Germany

16.50 *Break*

Chair: E. PELED, Israel

17.20 *FC-1:IL06* **Battery Architectures Based on Three-dimensional Electrode Designs**

B. DUNN, Department of Materials Science and Engineering, UCLA, Los Angeles, CA, USA

17.50 *FC-1:L07* **New Gel Polymer Electrolyte with Improved Intrinsic Safety for Use in Lithium-ion Batteries**

R. VUKICEVIC, S. OBEIDI, **A. LEX-BALDUCCI**, MEET Battery Research Center / Institute of Physical Chemistry, University of Münster, Germany

18.10 *FC-1:L08* **Local Structure of Lithium Orthosilicates Li₂MSiO₄ (M = Mn, Fe) Cathodic Materials: a Neutron Pair Distribution Function Study**

A. MANCINI, L. MALAVASI, Dip. di Chimica, Sezione Chimica Fisica, Università degli Studi di Pavia, INSTM UdR di Pavia, Pavia, Italy

18.30 *FC-1:L09* **Effect of Plasma Assisted Nanoparticle Dispersion on Thermal and Mechanical Properties of Electrospun Separators for Lithium-ion Batteries**

V. COLOMBO, M. GHERARDI, **R. LAURITA**, Alma Mater Studiorum - Università di Bologna, DIN, Bologna, Italy; D. FABIANI, M. ZACCARIA, Alma Mater Studiorum - Università di Bologna, DEI, Bologna, Italy; M.L. FOCARETE, C. GUALANDI, Alma Mater Studiorum - Università di Bologna, "G. Ciamician" Chemistry Dept., Bologna, Italy

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

Room: **ORSA MINORE**

Chair: LIDONG CHEN, China (*Programme Chair*)

15.00 *Welcome*

15.10 *FD-1:IL01* **A Search for Nonequilibrium Thermoelectrics**
I. TERASAKI, Department of Physics, Nagoya University, Nagoya, Japan

15.40 *FD-1:IL02* **Improved Thermoelectric Efficiency by Introducing New Doping Schemes**
M. ZEBARJADI, K. ESFARJANI, Rutgers University, Piscataway, NJ, USA; BOLIN LIAO, GANG CHEN, Massachusetts Institute of Technology, USA

16.10 *FD-1:IL03* **Computational Materials Design of Earth-abundant Thermoelectrics**
V. OZOLINS, FEI ZHOU, YI XIA, W. NIELSON, Department of Materials Science and Engineering, University of California, Los Angeles, CA, USA; M.D. NIELSEN, J.P. HEREMANS, Department of Mechanical and Aerospace Engineering, The Ohio State University, Columbus, OH, USA; XU LU, D.T. MORELLI, Department of Physics and Astronomy Michigan State University, East Lansing, MI, USA

16.40 *Break*

Chair: I. TERASAKI, Japan

17.10 *FD-1:IL04* **Utilizing NMR and Advanced Carrier Analysis for Development of Thermoelectric Materials**
E.M. LEVIN, U.S. DOE Ames Laboratory & Department of Physics and Astronomy, Iowa State University, Ames, IA, USA

17.40 *FD-1:IL05* **Ab-initio Calculations of the Lattice Thermal Conductivity**
L. CHAPUT, Institut Jean Lamour, UMR CNRS 7198, Université de Lorraine, Vandoeuvre Les Nancy Cedex, France

18.10 *FD-1:L06* **Effects of Vanadium Substitution on the Crystal Structure and Thermoelectric Properties of Higher Manganese Silicide**
Y. KIKUCHI, T. NAKAJO, K. HAYASHI, Y. MIYAZAKI, Department of Applied Physics, Tohoku University, Sendai, Japan; K. YUBUTA, Institute of Material Research, Tohoku University, Sendai, Japan

Session FE-1 - Tailored Synthesis of Nanostructured Materials for Photofunctional Properties

Room: **ORSA MAGGIORE**

Chair: G. CENTI, Italy (*Programme Chair*)

15.00 *Welcome*

15.10 *FE-1:IL01* **Development of Nanostructured Materials for Environmental and Energy Applications**

A. ORLOV, SHEN ZHAO, Stony Brook University, NY, USA

15.40 *FE-1:IL02* **Polymeric Materials as Substrates for Photocatalytic Degradation: Plasma and Selective Stabilization**

M.C. CANELA, M.S. CURCIO, W.R. WALDMAN, E.C. RANGEL, B.C. SANCHEZ, Universidade Estadual do Norte Fluminense Darcy Ribeiro, Campos dos Goytacazes, Brazil

16.10 *FE-1:L04* **Photocatalytic Films by Molecular Layer Deposition**

R. YERUSHALMI, Institute of Chemistry and the Center for Nanoscience and Nanotechnology, The Hebrew University of Jerusalem, Jerusalem, Israel

16.30 *Break*

17.00 *FE-1:IL05* **Engineering Design and Analysis to Determine the Kinetics of Contaminant Removal from Photocatalytic Self-Cleaning Surfaces**

D.F. OLLIS, North Carolina State University, Raleigh, NC, USA

17.30 *FE-1:L07* **Photoelectrochemical Properties of Doped Lanthanum Orthoferrites**

I. NATALI SORA, F. FONTANA, INSTM R.U. Bergamo and Dipartimento di Ingegneria, University of Bergamo, Dalmine, Italy; R. PASSALACQUA, C. AMPELLI, S. PERATHONER, G. CENTI, INSTM/CASPE R.U. and Dipartimento di Ingegneria Elettronica, Chimica ed Ingegneria Industriale (DIECI), University of Messina, Messina, Italy; **F. PARRINO**, L. PALMISANO, "Schiavello-Grillone" Photocatalysis Group, Dipartimento di Energia, Ingegneria dell'Informazione e Modelli Matematici (DEIM), University of Palermo, Palermo, Italy

Session FF-1 - Hard Magnetic Materials

Room: **TETTUCCIO (Hotel Tamerici)**

Chair: F. ALBERTINI, Italy (*Programme Chair*)

15.00 *Welcome*

15.10 *FF-1:IL01* **Material Criticalities in Magnetism**

O. GUTFLEISCH, TU Darmstadt, Material Science, Germany; Fraunhofer Project Group Materials Recycling and Resource Strategy IWKS, Hanau, Germany

15.40 *FF-1:IL02* **A Multi-scale Approach to Develop High Coercivity Dy-free Permanent Magnets**

H. SEPEHRI-AMIN, J. LIU, T. AKIYA, T. OHKUBO, K. HONO, Elements Strategy Initiative Center for Magnetic Materials, National Institute for Materials Science, Tsukuba, Japan; K. HIOKI, A. HATTORI, Daido Corporate Research & Development Center, Daido Steel Co. Ltd., Nagoya, Japan

16.10 *FF-1:IL03* **Approaches for the Discovery and Design of New Permanent Magnets**

M.J. KRAMER, R.T. OTT, D.D. JOHNSON, Ames Laboratory, Iowa State University, Ames, IA, USA

16.40 *FF-1:IL04* **Permanent Magnetic Materials for Energy Conversion and Power Generation: New Materials, New Designs**

L.H. LEWIS, Northeastern University, Boston, MA, USA

17.10 *Break*

Chair: J. PING LIU, USA

17.40 *FF-1:L05* **Modelling of Anisotropy and Coercivity in Novel Hard Magnets**

J. FIDLER, A. ASALI, P. TOSON, W. WALLISCH, Vienna University of Technology, Institute of Solid State Physics, Vienna, Austria

18.00 *FF-1:IL06* **MnBi Hard Magnets**

G.C. HADJIPANAYIS, N.V. RAMA RAO, University of Delaware, Newark, DE, USA

18.30 *FF-1:IL07* **Effects of Hydrogen on the Magnetic Properties of Rare-earth Iron Intermetallics for Energy**

O. ISNARD, Université Grenoble Alpes, Inst NEEL, Grenoble, France; CNRS, Institut NEEL, Grenoble, France

Session FG-1 - Wafer-based Silicon and High-efficiency Solar Cells

Room: **ZENITH**

Chair: **M. MAZZER**, Italy

15.00 *Welcome by Programme Chairs (G. Farinola and M. Mazzer)*

15.10 *FG-1:IL01* **Direct Growth of III-V Compound Semiconductors on Silicon for High-efficiency Solar Cells**

T. HANNAPPEL, O. SUPPLIE, S. BRÜCKNER, P. KLEINSCHMIDT, Helmholtz-Zentrum Berlin, Germany, and Ilmenau University of Technology, Germany; O. ROMANYUK, Academy of Sciences of the Czech Republic, Prague, Czech Republic; F. GROSSE, Paul-Drude Institut für Festkörperelektronik, Berlin, Germany

15.40 *FG-1:IL02* **Crystalline Silicon for Wafer-based Solar Cells**

DEREN YANG, State Key Laboratory of Silicon Materials and Department of Materials Science and Engineering, Zhejiang University, Hangzhou, China

16.10 *FG-1:L03* **Degradation Modeling of InGaP/GaAs/Ge Triple-junction Solar Cells Irradiated by Protons**

S.I. MAXIMENKO¹, M.P. LUMB², S.R. MESSENGER¹, R. HOHEISEL², C. AFFOUDA¹, D. SCHEIMAN¹, M. GONZALEZ³, J. LORENTZEN¹, P. P. JENKINS¹, R.J. WALTERS¹, ¹Naval Research Laboratory, Washington, DC, USA; ²The George Washington University, Washington, DC, USA; ³Sotera Defense Solutions, Annapolis Junction, MD, USA

16.30 *Break*

Session FG-2 - Thin-film Photovoltaics

Chair: **T. HANNAPPEL**, Germany

17.00 *FG-2:IL01* **Current Status and Future Prospects of the CIGS PV Technology**

S. NIKI¹, S. ISHIZUKA¹, Y. KWAMIKAWA¹, H. KOMAKI¹, K. MATSUBARA¹, H. SHIBATA¹, A. YAMADA¹, N. TERADA², T. SAKURAI³, K. AKIMOTO³, ¹Research Center for Photovoltaic Technologies, AIST, Central 2, Tsukuba, Ibaraki, Japan; ²Kagoshima University, Kagoshima, Kagoshima, Japan; ³Tsukuba University, Tsukuba, Ibaraki, Japan

17.30 *FG-2:IL03* **Transparent Conductors for Thin Film Solar Cells**

R.E. TREHARNE, J.D. MAJOR, A. RAHSED, L.J. PHILLIPS, **K. DUROSE**, Stephenson Institute for Renewable Energy, University of Liverpool, Chadwick Building, Peach St, Liverpool, UK

18.00 *FG-2:L04* **Dynamics of the CdTe Activation Treatment: Effect on the Electrical and Structural Properties of the Absorber**

A. ROMEO¹, A. SALAVEI¹, I. RIMMAUDO¹, F. PICCINELLI², D. MENOSSI³, A. BOSIO³, N. ROMEO³, ¹LAPS-Laboratory for Applied Physics, Department of Computer Science, University of Verona, Verona, Italy; ²Department of Biotechnology, University of Verona, Verona, Italy; ³Physics and Earth Science Department, University of Parma, Italy

Session FH-1 - Fundamentals

Room: **VENERE**

Chair: **J. PERKINS, USA** (*Programme Chair*)

15.00 *Welcome*

15.10 *FH-1:IL01* **New Insights into Electronic and Structural Properties of Zinc Oxide**

K. ELLMER, Helmholtz-Zentrum für Materialien und Energie, Dept. Solar Fuels, Berlin, Germany

15.40 *FH-1:IL02* **Structure and Performance of Oxide TFTs; High Mobility and High Stability**

SANG YEOL LEE, Department of Semiconductor Engineering, Cheongju University, Cheongju, Chungbuk, Korea

16.10 *FH-1:IL03* **Optoelectronic Properties of CdO**

T.D. VEAL, Stephenson Institute for Renewable Energy and Department of Physics, University of Liverpool, Liverpool, UK

16.40 *Break*

Chair: **SANG YEOL LEE, Korea**

17.10 *FH-1:IL04* **Fundamental Limits on Optical Transparency of Transparent Conducting Oxides**

C.G. VAN DE WALLE, D. STEIAUF, **H. PEELAERS**, Materials Department, University of California, Santa Barbara, CA, USA; **E. KIOUPAKIS**, Department of Materials Science and Engineering, University of Michigan, USA

17.40 *FH-1:IL06* **Fundamentals of Reliability and Instability Issues in Amorphous Oxide Semiconductor TFTs**

J.F. CONLEY Jr., School of EECS, Intercollege Materials Program, Oregon State University, Corvallis, OR, USA

Session FH-2 - Material Design and Characterization

18.10 *FH-2:IL06* **Transparent Conductive and Semiconductive Oxides by Hollow Cathode Gas Flow Sputtering**

B. SZYSZKA, R. MUYDINOV, TU Berlin, Berlin, Germany; **T. JUNG**, **K. ORTNER**, F. SCHMIDT, FhG-IST, Braunschweig, Germany

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

Room: **GUTTUSO (Hotel Croce di Malta)**

Chair: HUA-TAY LIN, USA (*Programme Chair*)

15.00 *Welcome*

15.10 *FJ-1:IL02* **Advanced Steels for Fission and Fusion Reactors**
A. MOESLANG, KIT, IAM, Karlsruhe, Germany

15.40 *FJ-1:IL03* **Adding Toughness to Nano-structured Ferritic Alloys**
THAK SANG BYUN, D.T. HOELZER, Oak Ridge National Laboratory, Oak Ridge, TN, USA; JI HYUN YOON, Korea Atomic Energy Research Institute, Daejeon, S. Korea; JEOUNG HAN KIM, Korea Institute of Materials Science, Changwon, S. Korea; G.R. ODETTE, University of California - Santa Barbara, Santa Barbara, CA, USA; S.A. MALOY, Los Alamos National laboratory, Los Alamos, NM, USA

16.10 *Break*

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

Chair: K. KONASHI, Japan

16.40 *FJ-3:IL01* **The Comprehensive First Mirror Test in the JET Tokamak for ITER**
M. RUBEL¹, D. IVANOVA¹, P. PETERSSON¹, A. GARCIA-CARRASCO¹, J. LIKONEN², A. WIDDOWSON³ and JET-EFDA Contributors*, *JET-EFDA, Culham Science Centre, Abingdon, UK; ¹Alfvén Laboratory, Royal Institute of Technology, Association Euratom - VR, Stockholm, Sweden; ²Association EURATOM-TEKES, VTT, Espoo, Finland; ³CCFE/EURATOM Fusion Association, Culham Science Centre, Abingdon, UK *See the Appendix of F. Romanelli *et al*, Proceedings of the 24th IAEA Fusion Energy Conference 2012, San Diego, USA

17.10 *FJ-3:IL02* **New Materials for Nuclear Fusion Plasma-facing Components**
C. LINSMEIER, Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung - Plasmaphysik, Jülich, Germany

17.40 *FJ-3:IL03* **Modeling Irradiation Damage and Dislocation Plasticity in Tungsten for Fusion Applications**
J. MARIAN, Lawrence Livermore National Laboratory, Livermore, CA, USA

18.10 *FJ-3:IL04* **Plasma Materials Interactions**
J. LINKE, J. DU, TH. LOEWENHOFF, G. PINTSUK, T. WEBER, M. WIRTZ, Forschungszentrum Jülich, Euratom Association, Jülich, Germany

Session FK-1 - Growth and Processing

Room: **URANO**

Chair: R. NEMANICH, USA (*Conference Co-Chair*)

15.00 *Welcome*

15.10 *FK-1:IL01* **Graphene Growth and Integration in Nanoelectronic Devices**

L. COLOMBO¹, Y. HAO², S. MCDONNELL³, R. ADDOU³, A. IS-MACH², A. AZCATL³, S.S. SONDE², S. BANERJEE², R.S. RUOFF², R.M. WALLACE³, ¹Texas Instruments, Dallas, TX, USA; ²University of Texas at Austin, Austin, TX, USA; ³University of Texas at Dallas, Dallas, TX, USA

15.40 *FK-1:IL02* **Science and Applications of Doped Nanocrystalline Diamond Films and Particles**

K. HAENEN, Hasselt University, Institute for Materials Research (IMO) & IMEC vzw, IMOMEC, Diepenbeek, Belgium

16.10 *FK-1:IL03* **Oriented Attachment Growth of Micro-sized Diamond Crystals from Detonation Nanodiamonds**

F.M. SHAKHOV, S.V. KIDALOV, P.G. BARANOV, R.A. BABUNTS, D.A. SAKSEEV, D.A. KIRILENKO, A.E. ALEKSENSKII, M.V. BAIDAKOVA, A.YA. VUL¹, Ioffe Institute, Saint-Petersburg, Russia

16.40 *FK-1:IL04* **Large Scale Growth of Graphene on SiC**

R. YAKIMOVA^{1,2}, G.R. YAZDI¹, T. IAKIMOV^{1,2}, V. DARAKCHIEVA¹, ¹Linköping University, Linköping, Swede; ²Graphensic AB, Sweden

17.10 *Break*

Chair: K. HAENEN, Belgium

17.40 *FK-1:IL05* **Synthesis & Assembly of Chemically Modified Graphitic Carbon Nanostructures**

SANG OUK KIM, Center for Nanomaterials and Chemical Reactions, Institute for Basic Science (IBS) Materials Science & Engineering, KAIST Daejeon, Republic of Korea

18.10 *FK-1:IL07* **Graphene Nanopatterning with Nanometer Precision and Edge Orientation Control**

L. TAPASZTO, Research Centre for Natural Sciences, Institute of Technical Physics and Materials Science, Budapest, Hungary

18.40 *FK-1:IL08* **Growth of Large-size Single-crystal Graphene Domains and Three-dimensional Interconnected Graphene Networks**

WENCAI REN, LIBO GAO, TENG MA, ZONGPING CHEN, HUI-MING CHENG, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, P.R. China

Session FL-1 - Mass and Charge Transport Mechanisms

Room: **BARZAGLI (Hotel Croce di Malta)**

Chair: HAN-ILL YOO, Korea (*Programme Chair*)

15.00 *Welcome*

15.10 *FL-1:IL01* **Quantum Spintronics: Engineering and Manipulating Atom-like Spins in Semiconductors**

D.D. AWSCHALOM, Institute for Molecular Engineering, University of Chicago, Chicago, IL, USA

15.40 *FL-1:IL02* **Local Investigation of Interference and Quantum Coherence in Ballistic Nanostructures Using a Scanning Gate**

A.A. KOZIKOV, C. RÖSSLER, T. IHN, K. ENSSLIN, C. REICHL, W. WEGSCHEIDER, Solid States Physics laboratory, ETH Zürich, Zürich, Switzerland; D. WEINMANN, IPCMS, Université de Strasbourg, CNRS UMR 7504, Strasbourg, France

16.10 *FL-1:IL04* **Recent Advances in the Theory and Computer Modelling of Interdiffusion in Alloys/Intermetallics and Ionic Compounds**

G.E. MURCH, I.V. BELOVA, A.V. EVTEEV, E.V. LEVCHENKO, University of Newcastle, Callaghan, NSW, Australia; P. SOWA, D. R. KUZUBSKI, Jagiellonian University, Krakow, Poland

16.40 *Break*

Chair: G.E. MURCH, Australia

17.10 *FL-1:IL05* **Mobility of Li Ions in Solids**

P. HEITJANS, Leibniz Universität Hannover, Institute of Physical Chemistry and Electrochemistry, Hannover, Germany

17.40 *FL-1:IL07* **Effects of Elastic Strain on Oxygen Transport and Reduction Kinetics in Oxides**

B. YILDIZ¹, ZHUHUA CAI¹, A. KUSHIMA¹, QIYANG LU¹, N. TSVETKOV¹, JEONG WOO HAN¹, YAN CHEN¹, J. FLEIG², M. KUBICEK²,
¹Laboratory for Electrochemical Interfaces, Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA; ²Institute of Chemical Technologies and Analytics, Vienna University of Technology, Vienna, Austria

Session FM-2 - Phase Change Memories (PCM)

Room: **ALBA 2**

Chair: S. SPIGA, Italy (*Programme Chair*) / M. LONGO, Italy

15.00 *Welcome*

15.10 *FM-2:IL01* **The Impact of Disorder on Transport in Crystalline Phase Change Materials**

M. WUTTIG, RWTH Aachen University of Technology, Aachen, Germany

15.40 *FM-2:IL02* **Neural Network Simulation of Phase Change Materials: Handling Large Models with DFT Accuracy**

G.C. SOSSO, S. GABARDI, G. MICELI, S. CARAVATI, **M. BER-NASCONI**, Department of Materials Science, University of Milano-Bicocca, Milano, Italy; J. BEHLER, Lehrstuhl fuer Theoretische Chemie, Ruhr-Universitaet, Bochum, Germany

16.10 *FM-2:L03* **TEM Study of the Low Resistance State in GST Ge Rich & N Doped PRAM Devices**

M. COUE¹, G. NAVARRO¹, **V. SOUSA**¹, V. DELAYE¹, L. PERNIOLA¹, N. BERNIER¹, P. NOÉ¹, F. FILLOT¹, C. SABBIONE¹, D. BLACHIER¹, P. ZULIANI², R. ANNUNZIATA², G. REIMBOLD¹, ¹CEA, LETI, MINATEC Campus, Grenoble Cedex, France; ²STMicroelectronics, Technology R&D, Agrate Brianza, Italy

16.30 *Break*

Chair: M. WUTTIG, Germany

17.00 *FM-2:IL06* **Chalcogenide Nanowires for Highly-scaled Phase Change Memories: from Synthesis to Functional Analysis**

M. LONGO, Laboratorio MDM, IMM-CNR, Agrate Brianza, Italy

17.30 *FM-2:L07* **Thermal Characterization of In-Sb-Te Thin Film**

H.T. NGUYEN, A. KUSIAK, J.L. BATTAGLIA, Laboratoire I2M, UMR 8508, Université Bordeaux 1, Talence Cedex, France; R. FALLICA, C. WIEMER, T. STOYCHEVA, M. LONGO, Laboratorio MDM, CNR-IMM, Agrate Brianza (MB), Italy

17.50 *FM-2:L08* **Temperature Dependent Thermal Conductivity of a GeSbTe Nanowire**

A. SACI, J.-L. BATTAGLIA; M. LONGO, R. FALLICA, C. WIEMER, Laboratoire I2M, UMR 8508, Université Bordeaux 1, Talence Cedex, France, with Laboratorio MDM, CNR-IMM, Agrate Brianza (MB), Italy

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

Room: **TORRETTA (Hotel Tamerici)**

Chair: D. PAVUNA, Switzerland (*Programme Chair*)

15.00 *Welcome*

15.10 *FN-1:IL01* **Ferroelectricity and Magnetoelectric Coupling in Underdoped Cuprates**

C. PANAGOPOULOS, Division of Physics and Applied Physics, Nanyang Technological University, Singapore

15.40 *FN-1:IL03* **Highest Zero-resistance Temperature (153K) of Hg1223 at High Pressures**

A. YAMAMOTO, RIKEN Center for Emergent Matter Science, Saitama, Japan

16.10 *FN-1:L04* **Superconductivity in $(\text{Cu}_{1-x}\text{Mo}_x)\text{Sr}_2\text{RECu}_2\text{O}_{7+\delta}$ (RE = Y, Er, Tm) Molibdocuprates**

M.A. ALARIO-FRANCO¹, S. MARIK^{1, 2}, E. MORÁN¹, C. LABRUGERE², O. TOULEMONDE², A. DOS SANTOS¹, I. HERRERO-AN-SORREGUI¹, ¹Dpto. Química Inorgánica, Facultad de CC. Químicas, U. Complutense de Madrid, Madrid, Spain; ²CNRS, Université de Bordeaux, ICMCB, Pessac, France

16.30 *Break*

Chair: C. PANAGOPOULOS, Singapore

17.00 *FN-1:IL05* **New Phenomenon Akin to Superconductivity and yet not Superconductivity: The Zero Magnetoresistance in Polymer Nanofibers**

YUNG WOO PARK, Department of Physics and Astronomy, Seoul National University, Seoul, Korea

17.30 *FN-1:IL06* **2D Superconductivity by Ionic Gating**

Y. IWASA, University of Tokyo and RIKEN, Tokyo, Japan

18.00 *FN-1:L07* **Exploring High-Tc Superconductivity by Strain and Electric Field Effect**

D. PAVUNA, EPFL, Lausanne, Switzerland

Session FO-1 - Advances in Biomaterials

Room: **SIRIO**

Chair: **A.R. BOCCACCINI**, Germany (*Programme Chair*)

15.00 *Welcome*

15.10 *FO-1:IL01* **Novel Nano- and Pico-technology Medical Devices: The Future is Here**

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

15.40 *FO-1:IL02* **Bioinspired 3D Structured Composites**

A.R. STUDART, Complex Materials, Department of Materials, ETH Zurich, Switzerland

16.10 *FO-1:IL03* **Macromolecular Crowding: The Next Frontier in Tissue Engineering**

D.I. ZEUGOLIS, Network of Excellence for Functional Biomaterials (NFB), National University of Ireland, Galway, Ireland

16.40 *Break*

17.10 *FO-1:IL04* **Rapid Prototyping of Biomaterials for Diagnostic, Drug Delivery, and Regenerative Medicine Applications**

R.J. NARAYAN, UNC/NCSU Joint Department of Biomedical Engineering, Raleigh, NC, USA

17.40 *FO-1:IL07* **Self-assembled Green Tea Nanocomplexes for Cancer Therapy**

M. KURISAWA, JOO EUN CHUNG, SUSI TAN, SHU JUN GAO, NUNNARPAS YONGVONGSOONTORN, JACKIE Y. YING, Institute of Bioengineering and Nanotechnology, The Nanos, Singapore

Session FA-1 - Solid Oxide (SOFCs) and Molten Carbonate (MCFCs) Fuel Cells

Room: AUDITORIUM

Chair: M. CASSIR, France

- 9.00 *FA-1:IL04* **Reconstruction and Analysis of Solid Oxide Fuel Cell Electrodes with Nano-sized Structures**
MENG NI, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong
- 9.30 *FA-1:IL05* **Density Functional Theory Combined with Experiments to Study the Triple Phase Boundaries of Solid Oxide Fuel Cells**
M. MALAGOLI¹, M.L. LIU², HYEON CHEOL PARKA³, **A. BONGIORNO**¹, ¹School of Chemistry & Biochemistry, Georgia Institute of Technology, Atlanta, GA, USA; ²School of Material Science & Engineering, Georgia Institute of Technology, Atlanta, GA, USA; ³Advanced Materials Research Center Samsung Advanced Institute of Technology (SAIT), Yongin-si, Republic of Korea
- 10.00 *FA-1:IL06* **Effect of Annealing on Crystal Structure and Conductivity of Plasma-Sprayed Protective Oxide for SOFC Interconnects**
KUAN-ZONG FUNG^{1, 2}, SHU-YI TSAIA², HSIN-CHIA HOAB, ¹Research Center for Energy Technology and Strategy; ²Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan, ROC
- 10.20 *FA-1:IL07* **Effect of Synthesis Methods on Catalytic and Structural Properties of SrTiO₃ for applications in SOFC anodes**
F. MARAZZI, A. PAPPACENA, **M. BOARO**, A. TROVARELLI, University of Udine, Udine, Italy
- 10.40 *FA-1:IL08* **Self Repairable Glass Seals for Solid Oxide Fuel Cells**
R.N. SINGH, School of Materials Science and Engineering, College of Eng., Architecture and Technology, Oklahoma State University, Tulsa, OK, USA
- 11.00 *FA-1:IL09* **Implications of Water-based Shaping Processing on the Properties of Gadolinium-doped Ceria**
A. CALDARELLI, E. MERCADELLI, A. SANSON, CERTIMAC and ISTEC-CNR, Faenza, Italy; S. PRESTO, M. VIVIANI, IENI-CNR, Genova, Italy
- 11.20 *Break*

Session FA-3 - State-of-the-art Application Engineering and Demonstrations

Chair: J.T.S. IRVINE, UK

- 11.50 *FA-3:IL01* **Perspectives for Fuel Cells and Hydrogen in Europe**
B. DE COLVENAER, FUEL CELLS AND HYDROGEN JOINT UNDERTAKING, Brussels, Belgium
- 12.20 *FA-3:IL02* **Materials and Concepts for Full Ceramic SOFCs with Focus on Carbon Containing Fuels**
P. HOLTAPPELS, B.R. SUDIREDDY, S. VELTZÉ, T. RAMOS, Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde, Denmark

Sub-Session FB-2.4 - Carbon Based Materials and Other High Surface Area Adsorbents

Room: **LE PLEIADI**

Chair: E. AKIBA, Japan

- 8.30 *FB-2.4:IL01* **Nanoconfined Complex Metal Hydrides**
P.E. DE JONGH, Inorganic Chemistry and Catalysis, Debye Institute for Nanomaterials Science, Utrecht University, Utrecht, Netherlands
- 9.00 *FB-2.4:L03* **Cycling, Kinetic and Structural Hydrogenation Properties of MgH₂-TiH₂ Nanocomposites**
F. CUEVAS, M. PONTHEU, M. LATROCHE, ICMPE, CNRS, Thiais, France; J.M. BELLOSTA VON COLBE, M. DORNHEIM, HZG, Centre for Materials and Coastal Research, Geesthacht, Germany; J.F. FERNÁNDEZ, Dpto. Física de Materiales, Universidad Autónoma de Madrid, Madrid, Spain
- 9.20 *FB-2.4:L04* **Hydrogen Storage Properties of Decorated Fullerenes**
C. MILANESE, A. GIRELLA, A. MARINI, Pavia H₂ Lab, Chemistry Department, University of Pavia, Italy; M. ARAMINI, M. GABOARDI, D. PONTIROLI, M. RICCO', Carbon Nanostructures Lab, Department of Physics and Earth Science, University of Parma, Italy
- 9.40 *Break*

Sub-Session FB-2.1 - Metal Hydrides

Chair: SHIN-ICHI ORIMO, Japan

- 10.10 *FB-2.1:IL06* **Investigating the Reaction Pathways when Cycling Multicomponent Metal Hydride Systems**
G.S. WALKER, Energy and Sustainability Research Division, University of Nottingham, Nottingham, UK
- 10.40 *FB-2.1:IL07* **Hydrogen Storage Properties of Mg-based Materials**
E. AKIBA, J. MATSUDA, International Institute for Carbon-Neutral Energy Research, Fukuoka, Japan
- 11.10 *FB-2.1:L08* **Electrochemical and Solid/Gas Investigation of Nb₄MSi (M=Co, Ni) Hydrides**
J. ANGSTROM, M. SAHLBERG, Dept. of Chemistry, Angström Laboratory, Uppsala Universitet, Uppsala, Sweden
- 11.30 *FB-2.1:L09* **The Preparation of Carbon-confined Mg Nanoparticles from Vapor**
S. SUWARNO, P.E. DE JONGH, Inorganic Chemistry and Catalysis, Debye Institute for Nanomaterials Science, Utrecht University, Utrecht, The Netherlands
- 11.50 *FB-2.1:L10* **Cyclability of Compacted MgH₂ Composites under Hydrogen Pressure**
D. MIRABILE GATTIA, A. MONTONE, ENEA, Materials Technology Unit, Casaccia Research Centre, Rome, Italy; G. GIZER, Hacettepe University, Nanotechnology and Nanomedicine Department, Beytepe Ankara, Turkey
- 12.10 *FB-2.1:L11* **Hydrogenation Properties of Zirconium-doped TiFe and TiFe_{0.9}Mn_{0.1} Alloys**
J. HUOT, C. GOSSELIN, P. JAIN, Univ. du Quebec a Trois-Rivieres, Canada; J. ECKSTEIN, Helmut Schmidt University, Germany

Session FC-1 - Batteries

Room: **GIOVE**

Chair: **S.G. GREENBAUM, USA**

- 8.30 *FC-1:IL10* **Materials and Processes in Rechargeable Sodium/Air Batteries**
E. PELED, H. MAZOR, M. GOOR, D. GOLODNITSKY, R. HADAR, School of Chemistry, Tel-Aviv University, Tel-Aviv, Israel; Wolfson Applied Materials Research Center, Tel-Aviv University, Tel-Aviv, Israel
- 9.00 *FC-1:IL11* **Precisely Engineered Colloidal Nanomaterials for Li- and Na-ion Batteries**
M.V. KOVALENKO, Institute of Inorganic Chemistry, ETH Zurich, Switzerland and Empa-Swiss Federal Laboratories for Materials Science and Technology, Switzerland
- 9.30 *FC-1:L12* **Concurrent Formation of LiCoO₂ Crystal / Li-B-O Glass Composite Layer onto a Pt Substrate by Glass-Flux-Coating**
Y. MIZUNO^{1, 2}, N. ZETTSU^{1, 2}, T. SAKAGUCHI³, T. SAITO³, H. WAGATA^{1, 2}, S. OISHI¹, K. TESHIMA^{1, 2}; ¹Shinshu University, Nagano, Japan; ²CREST, Japan Science and Technology Agency; ³Toyota Motor Corporation, Japan
- 9.50 *FC-1:L13* **Polymer-in-ceramic Solid Electrolyte for Li-ion Batteries**
G. GOLODNITSKY^{1, 2}, R. BLANGA¹, K. FREEDMAN¹, E. PELED¹, ¹School of Chemistry; ²Wolfson Applied Materials Research Center, Tel Aviv University, Tel Aviv, Israel
- 10.10 *FC-1:L14* **Conducting Polymers as Effective Additives for Positive Electrodes in Li-ion Batteries Working at High Rates**
P. JIMENEZ¹, B. LESTRIEZ¹, J.-P. BONNET², P. BLANCHARD³, J.-C. BADOT⁴, O. DUBRUNFAUT⁵, D. GUYOMARD¹, J. GAUBICHER¹, Réseau sur le Stockage Electrochimique de l'Energie (RS2E), FR CNRS 3459, France; ¹Institut des Matériaux Jean Rouxel (IMN), Université de Nantes, CNRS, Nantes, France; ²Lab. réactivité et chimie des solides (LRCS), CNRS UMR7314, Université de Picardie J. Verne, Amiens, France; ³Lab. MOLTECH-Anjou, CNRS UMR6200, Université de Angers, Angers, France; ⁴Institut de Recherche de Chimie Paris, CNRS UMR 8247, Chimie ParisTech, Paris, France; ⁵Lab. de Génie Electrique de Paris, CNRS UMR 8507, SUPELEC, Sorbonne; Universités, UPMC Univ Paris 06, Univ Paris-Sud, Gif-sur-Yvette, France

10.30 *Break*

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Chair: M.V. KOVALENKO, Switzerland

- 11.00 *FC-1:L15* **Novel Electrode Materials for Rechargeable Batteries**
D. GUYOMARD¹, L. ROUÉ², M. CERBELAUD¹, J. GAUBICHER¹, N. DUPRÉ¹, P. MOREAU¹, B. LESTRIEZ¹, ¹Institut des Matériaux Jean Rouxel (IMN), Université de Nantes, CNRS, Nantes, France; Réseau sur le Stockage Electrochimique de l'Energie (RS2E), FR CNRS 3459, France; ²INRS-Energie, Matériaux et Télécommunications, Varennes Québec, Canada
- 11.30 *FC-1:L16* **High Cost Performance Cathodes for Large Scale Rechargeable Batteries**
S. OKADA, T. KIDERA, N. DIMOV, H. HORI, A. KITAJOU, Institute for Materials Chemistry and Engineering, Kyushu University, Kasuga, Japan
- 11.50 *FC-1:L17* **Effects of Heat-treating Temperature on the Properties of LiMn_{1.5}Ni_{0.5}O₄ Cathode Materials**
SHE-HUANG WU, JE-JANG SHIU, Tatung University, Taipei, Taiwan; WEI KONG PANG, N. SHARMA, V.K. PETERSON, Australian Nuclear Science and Technology Organisation, Australia
- 12.10 *FC-1:L18* **Hydrothermal Synthesis of Porous Spindle LiFePO₄ as High Performance Cathode Material for Lithium Ion Batteries**
MEI LIN, BOLEI CHEN, H.L.W. CHAN, JIKANG YUAN, Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong, China
- 12.30 *FC-1:L19* **ESR Study of Electronic Properties, Valence State and Local Crystal Structure of Li-ion Battery Cathode Materials**
N.M. SULEIMANOV, Zavoisky Physical Technical Institute of Russian Academy of Sciences, Kazan, Russia; S.R.S. PRABAHARAN, VIT University, Chennai campus, India; D.R. ABDULLIN, Zavoisky Physical Technical Institute of Russian Academy of Sciences, Kazan, Russia; M.S. MICHAEL, Anna University, India
- 12.50 *FC-1:L25* **Lithium-ion Batteries: Cell Design, Production and Performance**
S. PASSERINI, Helmholtz Institute Ulm, Karlsruhe Institute of Technology, Ulm, Germany

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

Room: **ORSA MINORE**

Chair: **E.M. LEVIN, USA**

- 9.00 *FD-2:IL01* **Thermoelectrics Research: New Materials-related Approaches, Theoretical Guidance and Device Development**
G.S. NOLAS, Department of Physics, University of South Florida, Tampa, FL, USA
- 9.30 *FD-2:IL03* **Borides as Thermoelectrics**
TAKAO MORI, National Institute for Materials Science (NIMS) & University of Tsukuba, Japan
- 10.00 *FD-2:IL05* **High Performance Mg₂(Si,Sn) Based Thermoelectric Materials: Synthesis, Structure and Transport**
TIEJUN ZHU, X.B. ZHAO, Department of Materials Science and Engineering, Zhejiang University, Hangzhou, P.R. China
- 10.30 *Break*

Chair: **G.S. NOLAS, USA**

- 11.00 *FD-2:IL06* **Development, Synthesis and Characterisation of Advanced Thermoelectric Materials for High Temperature Energy Conversion**
A. WEIDENKAFF, WENJIE XIE, XINGXING XAO, FAN FU, Materials Chemistry, Institute for Materials Science, University of Stuttgart, Stuttgart; Germany
- 11.30 *FD-2:IL07* **Abnormal Thermoelectric Properties in Copper Chalcogenides**
XUN SHI, WENQING ZHANG, LIDONG CHEN, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China
- 12.00 *FD-2:IL08* **Stability, Structure and Properties of Sb₂Te₃-Bi₂Te₃ Intergrowths and Superlattices**
M. WINKLER¹, J. KÖNIG¹, A.L. HANSEN², T. DANKWORT³, J.D. KÖNIG¹, H. BÖTTNER¹, K. BARTHOLOMÉ¹, W. BENSCH², L. KIENLE³, ¹Fraunhofer Institute for Physical Measurement Techniques IPM, Thermoelectric Systems, Freiburg, Germany; ²Institute of Inorganic Chemistry, Christian-Albrechts University Kiel, Kiel, Germany; ³Institute for Materials Science, Synthesis and Real Structure, Christian-Albrechts University Kiel, Kiel, Germany

Session FE-1 - Tailored Synthesis of Nanostructured Materials for Photofunctional Properties

Room: ORSA MAGGIORE

Chair: A. ORLOV, USA

- 9.00 *FE-1:IL09* **Nanostructured Photocatalysts for Solar Fuel Synthesis: Materials and Dynamics Studies**
JUNWANG TANG, Department of Chemical Engineering, University College London, London, UK
- 9.30 *FE-1:IL10* **Sunlight-storing Heterojunction Electrodes for Night-time Applications**
HYUNWOONG PARK, School of Energy Engineering, Kyungpook National University, Daegu, Korea
- 10.00 *FE-1:L11* **Overall Water-splitting Photocatalyst under Visible Light; Conduction-Band-Controlled Silver Tantalate**
H. IRIE, Clean Energy Research Center, University of Yamanashi, Kofu, Yamanashi, Japan
- 10.20 *FE-1:L12* **Photoelectrochemical Study of Anodized TiO₂ Nanotubes and Electrospun TiO₂ Fibres**
D. REGONINI¹, A.C. TELOEKEN², A.P. GARCIA², A.K. ALVES², A. BRAUN¹, F. CLEMENS¹, ¹Laboratory for High Performance Ceramics, EMPA-Swiss Federal Laboratories for Materials Science & Technology, Dübendorf, Switzerland; ²Laboratory of Ceramic Materials, Federal University of Rio Grande do Sul, Porto Alegre, RS, Brazil
- 10.40 *Break*

Session FE-2 - Advances in Fundamental Mechanism Understanding

Chair: N. KELLER, France

- 11.10 *FE-2:IL01* **Fundamental Studies on Photocatalysis**
B. OHTANI, Hokkaido University, Sapporo, Japan
- 11.40 *FE-2:L03* **Isotope Labeled Titania: Raman spectra, Photocatalysis and Electrochemistry**
L. KAVAN, J. Heyrovsky Institute of Physical Chemistry, Prague, Czech Republic
- 12.00 *FE-2:L04* **Effect of Ferroelectricity on Solar-Light-Driven Photocatalytic Activity of BaTiO₃ -Influence on the Carrier Separation and Stern Layer Formation**
YONGFEI CUI, J. BRISCOE, S. DUNN, Materials Research Institute, School of Engineering and Materials Science, Queen Mary University of London, London, UK
- 12.20 *FE-2:L05* **Hydrogen-doping of Mesoporous TiO₂: Characterization of Electronic States and Impact on Photocatalytic Performance**
T. BERGER^{1,2}, J. IDÍGORAS², J.A. ANTA², ¹Department of Materials Science and Physics, University of Salzburg, Salzburg, Austria; ²Área de Química Física, Universidad Pablo de Olavide, Sevilla, Spain

Session FF-1 - Hard Magnetic Materials

Room: **TETTUCCIO (Hotel Tamerici)**

Chair: G.C. HADJIPANAYIS, USA

- 8.30 *FF-1:IL08* **High Performance Hard Magnetic Thick Films**
N.M. DEMPSEY, D. LE ROY, N. GUNDUZ-AKDOGAN, O. AKDOGAN, D. GIVORD, Univ. Grenoble Alpes, Inst NEEL, Grenoble, France; CNRS, Inst NEEL, Grenoble, France
- 9.00 *FF-1:L09* **Development of L10 Tetragonal Phase in Continuous and Nanopatterned Fe-Pd Films by Post-deposition Annealing**
P. TIBERTO¹, G. BARRERA¹, F. CELEGATO¹, M. COISSON¹, F. VINAI¹, P. RIZZI², ¹INRIM, Electromagnetism Division, Torino, Italy; ²Chemistry Dept, Università di Torino, Torino, Italy
- 9.20 *FF-1:IL10* **Fabrication of Nanostructured Permanent Magnets- Approaches from the Bottom**
J. PING LIU, Department of Physics, University of Texas at Arlington, TX, USA
- 9.50 *FF-1:L11* **Influence of Mechanical Milling on Properties of Sr-Fe₁₂O₁₉ and SrFe₁₂O₁₉/Fe_{0.65}Co_{0.35}; SrFe₁₂O₁₉/FeCoSiB Hard/Soft Magnetic Nanocomposite**
M.N. GUZIK, S. DELEDDA, B.C. HAUBACK, Institute for Energy Technology, Kjeller, Norway; A. BOLLERO, E. BERGANZA, IMDEA Nanociencia, Campus Universitario de Cantoblanco, Madrid, Spain; A. QUESADA, J.F. FERNÁNDEZ, Instituto de Cerámica y Vidrio, CSIC Kelsen, Madrid, Spain; A.M. ARAGÓN, P. MARIN, Instituto de Magnetismo Aplicado, Las Rozas, Madrid, Spain
- 10.10 *FF-1:IL13* **Single Domain SmCo₅@Co Exchange-coupled Magnets Prepared from Core/shell Complex/GO Particles**
CE YANG¹, LIHUI JIA², SHOUGUO WANG³, CHEN GAO², DAWEI SHI², **YANGLONG HOU**¹, SONG GAO², ¹Department of Materials Science and Engineering, College of Engineering, Beijing, China; ²College of Chemistry and Molecular Engineering, Peking University, Beijing, China; ³Institute of Physics, Chinese Academy of Sciences, Beijing, China
- 10.40 *FF-1:L14* **Magnetic Properties of Cobalt Ferrite Nanoparticles for Permanent Magnets**
E. LOTTINI, A. LÓPEZ-ORTEGA, G. CAMPO, E. FANTECHI, C. INNOCENTI, INSTM-Univ. of Florence, Sesto Fiorentino, Italy; **C. DE JULIÁN FERNÁNDEZ**, IMEM-CNR, Parma, Italy & INSTM; C. SANGREGORIO, ISTM-CNR, Milano, Italy & INSTM

11.00 *Break*

Session FF-2 - Soft Magnetic Materials

Room: **TETTUCCIO (Hotel Tamerici)**

Chair: L.H. LEWIS, USA

- 11.30 *FF-2:IL01* **High Bs-FeSiBPCu Nanocrystalline Soft Magnetic Alloys Contributable to Energy-saving**
A. MAKINO, Institute for Materials Research, Tohoku University, Sendai, Japan
- 12.00 *FF-2:L02* **The Influence of Small Mn Additions on Microstructure and Magnetic Properties of Fe-Si-B-P-Cu Glass-coated Submicron Wires**
N. LUPU, S. CORODEANU, H. CHIRIAC, National Institute of Research and Development for Technical Physics, Iasi, Romania; P. SHARMA, A. MAKINO, Research and Development Center for Ultra High Efficiency Nano-crystalline Soft Magnetic Material, Tohoku University, Japan
- 12.20 *FF-2:L03* **Influence of Magnetic Field of Super High Frequency on Hysteretic Properties of Soft Magnetic Microwires**
A. CHIZHIK, J. GONZALEZ, Universidad del Pais Vasco, UPV/EHU, San Sebastian, Spain; A. STUPAKIEWICZ, A. MAZIEWSKI, University of Bialystok, Bialystok, Poland; A. ZHUKOV, Universidad del Pais Vasco, UPV/EHU, San Sebastian and IKERBASQUE, Bilbao, Spain

Session FG-2 - Thin-film Photovoltaics

Room: **ZENITH**

Chair: K. DUROSE, UK

- 9.30 *FG-2:IL05* **Junction Formation for Chalcopyrite Solar Cells**
R. KLENK, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany
- 10.00 *FG-2:IL06* **Current Status of Multijunction Thin-film Silicon Based Solar Cells: From State-of-the art Devices to Easthetic Building Elements**
J.-W. SCHÜTTAUF, C. BALLIF, Ecole Polytechnique Fédérale de Lausanne (EPFL), Photovoltaics and Thin Film Electronics Laboratory, Neuchâtel, Switzerland
- 10.30 *Break*

Session FG-3 - Emerging Technologies and New Concepts

Chair: S. NIKI, Japan

- 11.00 *FG-3:IL02* **New Carbon-based Materials for the Preparation of Dye Sensitized Solar Cells**
N. MARTÍN^{1,2}, **J.L. DELGADO**², ¹Departamento de Química Orgánica, Facultad de Ciencias Químicas, Universidad Complutense de Madrid, Madrid, Spain; ²IMDEA-Nanociencia, Facultad de Ciencias, Módulo CIX, 3^a planta, Ciudad Universitaria de Cantoblanco, 28049 Madrid, Spain
- 11.30 *FG-3:IL03* **Unravelling Electronic Processes and Phenomena in Organic Materials through Polymer Scientists' Tools**
N. STINGELIN, Imperial College London, London, UK
- 12.00 *FG-3:L04* **Thiol Functionalization: A Novel Class of Organic Additives for BHJ Solar Cells**
A. OPERAMOLLA¹, A. PUNZI¹, O. HASSAN OMAR², D. GENTILE¹, D. BLASI¹, F. BABUDRI¹, G.M. FARINOLA^{1,2}, ¹Dipartimento di Chimica, Università degli Studi di Bari Aldo Moro, Bari, Italy; ²CNR-ICCOM, Bari, Italy

Session FH-2 - Material Design and Characterization

Room: **VENERE**

Chair: **D.O. SCANLON, UK**

- 8.30 *FH-2:IL01* **Low-temperature Solution-processible Metal Oxide Nanoparticles for Interfacial Contact Layers in Organic Photovoltaics**
YUN-JU LEE, JIAN WANG, D. BARRERA, **JULIA W.P. HSU**, Department of Materials Science and Engineering, University of Texas at Dallas, Richardson, TX, USA
- 9.00 *FH-2:IL02* **In₂O₃ and ZnO Based Transparent Conductive Oxide Films with High Electron Mobility**
T. KOIDA, H. SAI, H. SHIBATA, M. KONDO, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan
- 9.30 *FH-2:IL03* **The Influence of Doping on Properties of Transparent Semiconducting Oxides**
HAO GONG, Department of Materials Science and Engineering, National University of Singapore, Singapore
- 10.00 *FH-2:IL04* **Semiconductor Nanoheterostructures Based on Wide Gap Metal Oxides and A₂B₆ Quantum Dots**
M.N. RUMYANTSEVA, A.S. CHIZHOV, R.B. VASILIEV, L.I. RYABOVA, D.R. KHOKHOLOV, A.M. GASKOV, Moscow State University, Moscow, Russia; A.M. ABAKUMOV, University of Antwerp, Antwerp, Belgium
- 10.30 *Break*

Chair: **HAO GONG, Singapore**

- 11.00 *FH-2:IL05* **Molecular Monolayer Tuning of Organic/Metal Oxide Interfaces**
T.M. BRENNER, G. CHEN, J. BRAID, T.E. FURTAK, **R.T. COLLINS**, Colorado School of Mines, Golden, CO, USA; D.C. OLSON, D.S. GINLEY, National Renewable Energy Laboratory, Golden, CO, USA
- 11.30 *FH-2:L07* **New, Highly Conducting Si-doped ZnO Thin Films Prepared by Spray Pyrolysis**
V.L. KUZNETSOV, N. RASHIDI, P.P. EDWARDS, Inorganic Chemistry Laboratory, Department of Chemistry, University of Oxford, Oxford, UK
- 11.50 *FH-2:L08* **Conductive Path Formation Using Lattice Defects in Insulating Oxide Crystals**
A. NAKAMURA, Nagoya University, Nagoya, Japan; E. TOCHIGI, Y. SATO, T. MIZOGUCHI, N. SHIBATA, Y. IKUHARA, University of Tokyo, Tokyo, Japan; K. TOYOURA, K. MATSUNAGA, Nagoya University, Nagoya, Japan
- 12.10 *FH-2:L09* **Chemical Solution Deposition via Ink Jet Printing of Aqueous Al-doped ZnO Precursors**
K. VERNIEUWE, P. LOMMENS, K. DE BUYSSER, Ghent University, Department of Inorganic and Physical Chemistry, Belgium

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

Room: **GUTTUSO (Hotel Croce di Malta)**

Chair: A. MOESLANG, Germany

- 8.30 *FJ-2:IL01* **Indian Test Blanket Module in ITER - Development of RAFM Steel and Fabrication Technology**
T. JAYAKUMAR, Metallurgy & Materials Group Indira Gandhi Centre for Atomic Research, Kalpakkam, India; E. RAJENDRA KUMAR, TBM Division, Institute of Plasma Research, Gandhi Nagar, India
- 9.00 *FJ-2:IL02* **Recent Developments on RAFM Steels**
E. WAKAI, M. ANDO, N. OKUBO, K. WATANABE, H. NAKAMURA, H. TANIGAWA, Japan Atomic Energy Agency, Naka-gun, Japan; D. BERNARDI, ENEA, Italy
- 9.30 *FJ-2:IL03* **Effects of Neutron Irradiation on MAX-phase Ceramics**
Y. KATOH, CHUNGHAO SHIH, A. PEREZ-BERGQUIST, K.J. LEONARD, S.J. ZINKLE, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, USA; T. TOYAMA, T. SHIKAMA, Institute of Materials Research, Tohoku University, Japan
- 10.00 *FJ-2:IL04* **Study on the Creep and Fatigue Properties of CLAM Steel**
YANYUN ZHAO^{1, 2}, **SHAOJUN LIU**², QUNYING HUANG², BOYU ZHONG², GANG XU¹, FDS Team ¹Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, China; ²University of Science and Technology of China, Hefei, Anhui, China
- 10.30 *FJ-2:L05* **Effect of Phase Transformation on Impact Properties In the Weld Heat-affected Zone of a Reduced Activation Ferritic/Martensitic Steel**
JOONOH MOON, CHANG-HOON LEE, TAE-HO LEE, Korea Institute of Materials Science (KIMS), Changwon, South Korea
- 10.50 *FJ-2:L06* **Effect of Cooling Rate of Normalizing on Microstructures and Mechanical Properties of Low Activation Ferritic Martensitic Steels**
CHANG-HOON LEE, JOONOH MOON, TAE-HO LEE, Korea Institute of Materials Science, Changwon, South Korea
- 11.10 *Break*

Session FJ-5 - Nuclear Fuel Materials

Chair: L. SANNEN, Belgium

- 11.40 *FJ-5:IL01* **Ceramic-based Materials for Accident Tolerant Nuclear Fuels**
T.M. BESMANN, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA
- 12.10 *FJ-5:IL02* **Microstructural Features of the High Burnup Structure**
T. WISS, V.V. RONDINELLA, R.J.M. KONINGS, D. STAIKU, D. PAPAIOANNOU, S. BREMIER, O. BENES, J.-Y. COLLE, P. PÖML, P. VAN UFFELEN, F. CAPPIA, European Commission, Joint Research Centre, Institute for Transuranium Elements, Karlsruhe, Germany
- 12.40 *FJ-5:L03* **Characterization of SiC Ceramic Tube Prepared by CVI/CVD Process**
JI YEON PARK, DAEJONG KIM, WEON-JU KIM, Korea Atomic Energy Research Institute, Daejeon, Korea

Session FK-1 - Growth and Processing

Room: **URANO**

Chair: Y. GOGOTSI, USA

- 8.30 *FK-1:IL09* **What Would be the First Industrial Scale Application of Single-walled Carbon Nanotubes and Why?**
KENJI HATA, AIST, Tsukuba, Japan
- 9.00 *FK-1:IL10* **Hierarchical Nanoporous Carbon Materials for Supercapacitors and Lithium Sulfur Batteries**
S. KASKEL, Dresden University of Technology, and Fraunhofer IWS, Germany
- 9.30 *FK-1:IL11* **Insights in the Synthesis of Carbon Nanostructures from Computer Simulation**
C. BICHARA, M. DIARRA, CINaM, CNRS and Aix Marseille University, France; H. AMARA, F. DUCASTELLE, LEM, ONERA and CNRS, Chatillon, France
- 10.00 *Break*

Session FK-2 - Structural Characterization

Chair: M.V. BAIDAKOVA, Russia

- 10.30 *FK-2:IL01* **Boron Doping Profiling in Diamond Multilayers by Electron Microscopy**
D. ARAUJO¹, M.P. ALEGRE¹, J.C. PIÑERO¹, P. VILLAR¹, A. FIORI², E. BUSTARRET², ¹Dpto. Ciencia de los Materiales e IM y QI, Universidad de Cádiz, Puerto Real (Cádiz), Spain; ²Institut Néel, CNRS-Université Joseph Fourier, Grenoble, France
- 11.00 *FK-2:IL02* **Characterization of Diamond-molecular Interfaces by Advanced SPM**
B. REZEK, Institute of Physics ASCR, Prague, Czech Republic
- 11.30 *FK-2:IL03* **Extended Defects in 2D-materials: Graphene, MoS₂ and Silica Bilayers**
A.V. KRASHENINNIKOV^{1,2}, H.-P. KOMSA¹, S. KURASCH³, J. KOTAKOSKI^{1,4}, O. LEHTINEN^{1,3}, U. KAISER³, ¹Department of Physics, University of Helsinki, Finland; ²Department of Applied Physics, Aalto University, Finland; ³Central Facility for Electron Microscopy, Group of Electron Microscopy of Materials Science, Ulm University, Ulm, Germany; ⁴Department of Physics, University of Vienna, Austria
- 12.00 *FK-2:IL04* **Kelvin Force Microscopy on Graphene**
W. MERTIN, C. ALVARADO, G. BACHER, Universität Duisburg-Essen, Duisburg, Germany
- 12.30 *FK-2:IL05* **Atomic Imaging and Spectroscopy of Two-dimensional Carbon and Non-carbon Materials**
K. SUENAGA, Nanotube Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan

Session FL-1 - Mass and Charge Transport Mechanisms

Room: **BARZAGLI (Hotel Croce di Malta)**

Chair: D.D. AWSCHALOM, USA

- 8.30 *FL-1:IL08* **Direct Evaluation of Electrochemical Reactions in Solid Oxide Fuel Cells under Operation**
K. AMEZAWA, Y. FUJIMAKI, T. NAKAMURA, K. NITTA, Y. TERADA, F. IGUCHI, H. YUGAMI, T. KAWADA, Tohoku University, Sendai, Japan
- 9.00 *FL-1:IL09* **Ionic and Electronic Transport under Chemical Potential Gradients**
M. MARTIN, Institute of Physical Chemistry, RWTH Aachen University, Aachen, Germany
- 9.30 *FL-1:IL10* **Electron Quantum Transport in Disordered Graphene**
I. DERETZIS, A. LA MAGNA, CNR-IMM, Catania, Italy
- 10.00 *FL-1:IL11* **Mass Transport in Grain Boundaries: Mechanism and Controversial Subjects**
B. BOKSHEYN, National University of Science and Technology "MISIS", Moscow, Russia
- 10.30 *Break*

Session FL-3 - Role of Mass and Charge Transport in Application Engineering

Chair: M. MARTIN, Germany

- 11.00 *FL-3:IL01* **Graphene for Low Energy Applications**
ZHIHONG CHEN, Purdue University, West Lafayette, IN, USA
- 11.30 *FL-3:IL02* **Effects of Lattice Strain on Oxide Ion Diffusivity in Pr₂NiO₄ Doped with Cu and Ni**
T. ISHIHARA, J. HOYODO, J. DRUCE, S. IDA, J.A. KILNER, International Institute for Carbon Neutral Energy Research, Kyushu University, Fukuoka, Japan
- 12.00 *FL-3:IL03* **Role of Defects in Non-equilibrium Impurity Transport Applied to Semiconductor Processing**
L. PELAZ, M. ABOY, I. SANTOS, P. LÓPEZ, L. MARQUES, Universidad de Valladolid, Valladolid, Spain
- 12.30 *FL-3:L04* **Spin Orientation and Transport in Germanium: Hole and Electron Spin Diffusion Lengths**
M. CANTONI, C. RINALDI, S. BERTOLI, R. BERTACCO, CNISM and LNESS - Dipartimento di Fisica, Politecnico di Milano, Como, Italy

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

Room: **TORRETTA (Hotel Tamerici)**

Chair: SHUHENG H. PAN, USA

- 9.00 *FN-2:IL01* **Progress in Epitaxial Thin Films of 122-type Iron-pnictide Superconductors: Non-equilibrium Impurity Doping and Critical Current Density**
H. HIRAMATSU^{1, 3}, **H. HOSONO**^{1, 2, 3}, ¹Materials and Structures Laboratory, ²Materials Research Center for Element Strategy, ³Frontier Research Center, Tokyo Institute of Technology, Japan
- 9.30 *FN-2:IL03* **Fabrication and Properties of Iron-based Superconducting Films**
E. BELLINGERI, S. KAWALE, V. BRACCINI, A. GERBI, R. BUZIO, L. PELLEGRINO, A. SALA, A. PALENZONA, M. PUTTI, C. FERDEGHINI, CNR-SPIN Genova, Genova, Italy, Physics Dept., University of Genova, Italy; A. JOST, U. ZEITLER, High Field Magnet Lab., Inst. for Molecules and Materials, Radboud University Nijmegen, Netherlands; C. TARANTINI, J. JAROSZYNSKI, Applied Superconductivity Center, National High Magnetic Field Lab., Florida State University, Tallahassee, FL, USA; E. REICH, B. HOLZAPFEL, IFW Dresden, Dresden, Germany
- 10.00 *FN-2:IL04* **Separation of Antiferromagnetism and High-temperature Superconductivity in Ca_{1-x}La_xFe₂As₂**
J. PAGLIONE, S.R. SAHA, T. DRYE, S.K. GOH, L.E. KLINTBERG, J.M. SILVER, F.M. GROSCHKE, M. SUTHERLAND, T.J.S. MUNSIE, G.M. LUKE, D. K. PRATT, J.W. LYNN, Center for Nanophysics and Advanced Materials, Dept. of Physics, University of Maryland, College Park, MD, USA
- 10.30 *FN-2:IL05* **Multiband Superconductivity on the Verge of a Fermi-surface Topological Transition in 122 Fe-based Compounds**
D. DAGHERO, G.A. UMMARINO, S. GALASSO, R.S. GONNELLI, Dip. di Scienza Applicata e Tecnologia (DISAT), Politecnico di Torino, Torino, Italy; G. PROFETA, Dip. di Fisica, Università dell'Aquila, L'Aquila, Italy; K. SUZUKI, Dept. of Engineering Science, The University of Electro-Communications, Chofu, Tokyo, Japan
- 11.00 *Break*

Chair: E. BELLINGERI, Italy

- 11.30 *FN-2:IL06* **Pairing Interaction in the Fe-based Superconductors Studied with Atomically Resolved Scanning Tunneling Microscopy/Spectroscopy**
SHUHENG H. PAN, Department of Physics, University of Houston, Houston, TX, USA; Texas Center for Superconductivity; Institute of Physics, Chinese Academy of Sciences
- 12.00 *FN-2:IL07* **Angle-resolved Photoemission Spectroscopy Study of Iron-pnictide Superconductors**
HONG DING, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, CAS, Beijing, China
- 12.30 *FN-2:L08* **Superconductivity at T_c = 36.5 K in Na-substituted SrFe₂As₂ Single Crystals**
L. SHLYK, M. BISCHOFF, R. NIEWA, Institut für Anorganische Chemie, Universität Stuttgart, Stuttgart, Germany; E. ROSE, Physikalisches Institut, Universität Stuttgart, Stuttgart, Germany

Session FO-1 - Advances in Biomaterials

Room: **SIRIO**

Chair: D.I. ZEUGOLIS, Ireland

- 9.00 *FO-1:IL08* **Multifunctional Polymer Networks for Regenerative Medicine**
A. LENDLEIN, Institute of Biomaterials Science and Berlin-Brandenburg Centre for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany
- 9.30 *FO-1:IL09* **Advanced Applications of Bioactive Glasses: Vascularization, Drug Release, Wound Healing and Soft Tissue Regeneration**
V.P. MIGUEZ, **A.R. BOCCACCINI**, Institute of Biomaterials, University of Erlangen-Nuremberg, Erlangen, Germany
- 10.00 *FO-1:L10* **In-vivo Toxicity Evaluation for Nanophosphors as an Alternative to Quantum Dots**
GUN HYUK JANG, SU YEON KIM, HO SEONG JANG, **KWAN HYI LEE**, Korea Institute of Science and Tech. (KIST) Seoul, Rep.of Korea; University of Science and Tech. (UST), Seoul, Rep.of Korea
- 10.20 *FO-1:L11* **Facile in situ Synthesis and Impregnation of Silver Nanoparticles in a Hydrophobic Polymer for Antimicrobial Biomaterials**
P.A. TRAN, A.J. O'CONNOR, Dept. of Chemical and Biomolecular Engineering, Particulate Fluids Processing Centre, The University of Melbourne, Victoria, Australia; D.M. HOCKING, Department of Microbiology and Immunology, The University of Melbourne, Australia
- 10.40 *Break*

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Chair: A.R. STUDART, Switzerland

- 11.10 *FO-1:L15* **Diopside Glass-ceramics for Dental and Biomedical Applications**
J. AL-MUHAMADI, N. KARPUKHINA, M. CATTELL, Centre for Adult Oral Health, Inst. of Dentistry, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, UK
- 11.30 *FO-1:L16* **Systematic Approach to Preparing Ceramic-glass Composites with High Translucency for Dental Restorations**
H.N. YOSHIMURA, A. CHIMANSKI, Universidade Federal do ABC, Santo André, SP, Brazil; P.F. CESAR, Universidade de Sao Paulo, Sao Paulo, SP, Brazil
- 11.50 *FO-1:L17* **Bioactive and Biocompatible Silica/Pseudowollastonite Aerogels**
P.J. RESÉNDIZ HERNÁNDEZ, D.A. CORTÉS HERNÁNDEZ, CINVESTAV-IPN, Unidad Saltillo, Ramos Arizpe, Mexico
- 12.10 *FO-1:L18* **Biocompatible Hydroxyapatite Nanotubes**
B.B. CHANDANSHIVE, **D. KHUSHALANI**, Materials Chemistry Group, Department of Chemical Sciences, Tata Institute of Fundamental Research, Colaba, Mumbai, India
- 12.30 *FO-1:L19* **Surface Modification of Highly Dispersed Cobalt Iron Oxide Nanoparticles by Anionic Surfactant (OA-PEG) for Hyperthermia Therapy Application**
A.B. SALUNKHE¹, V.M. KHOT², S.I. PATIL¹, S.H. PAWAR², ¹Department of Physics, University of Pune, Ganeshkhind, Pune, Maharashtra, India; ²Center for Interdisciplinary Research, D.Y. Patil University, Kolhapur, Maharashtra, India

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

Room: **AUDITORIUM**

Chair: N. ALSONSO-VANTE, France

- 15.00 *FA-2:IL05* **Development of Pt and Pt-Alloy Electrocatalysts for the Next Generation Polymer Electrolyte Fuel Cells**
M. WATANABE, H. UCHIDA, M. WAKISAKA, S. YANO, Fuel Cell Nanomaterials Center, University of Yamanashi, Kofu, Japan
- 15.30 *FA-2:IL06* **Electrocatalyst Stability under Dynamic and Stationary Operation of Polymer Electrolyte Fuel Cells**
K.A. FRIEDRICH, S. HELMLY, German Aerospace Center, Institute of Technical Thermodynamics, Stuttgart, Germany; R. HIESGEN, T. MORAWIETZ, University of Applied Sciences Esslingen, Department of Basic Science, Esslingen, Germany
- 16.00 *FA-2:IL07* **Towards Fuel Cell Vehicle Commercialization**
I. CERRI, Toyota Motor Europe, Zaventem, Belgium
- 16.30 *Break*

Chair: I. CERRI, Belgium

- 17.00 *FA-2:IL08* **High Temperature Polymer Fuel Cell Membranes Based on PBI**
E. QUARTARONE, Dept. of Chemistry, University of Pavia, and INSTM, Pavia Italy
- 17.30 *FA-2:IL09* **New Polymer Electrolyte Membranes for Fuel Cells**
E.A. WEIBER, HAI-SON DANG, S. TAKAMUKU, **P. JANNASCH**, Department of Chemistry, Lund University, Lund, Sweden
- 18.00 *FA-2:L10* **Functionalized Metal Oxide Particles: A Comparative Study on their Use as Additives in Polymer Electrolyte Membranes**
M.A. NAVARRA, S. PANERO, I. PETTITI, M. SGAMBETTERRA, Sapienza University of Rome, Rome, Italy
- 18.20 *FA-2:L11* **Water-free Proton-conducting Membranes at Elevated Temperature**
J. JALILI, V. TRICOLI, Department of Civil and Industrial Engineering, University of Pisa, Pisa, Italy

Session FB-1 - Hydrogen Production

Room: LE PLEIADI

Chair: A.H. McDANIEL, USA

- 15.00 *FB-1:IL06* **Hydrogen Generation by Electrolysis of Liquid Ammonia**
N. HANADA, Graduate School of Systems and Information Engineering, University of Tsukuba, Tsukuba, Ibaraki, Japan
- 15.30 *FB-1:IL07* **Ceria Based Materials with Enhanced OSC Properties for H₂ Production by Water Splitting Reaction**
A. PAPPACENA, M. BOARO, L. BARDINI, A. TROVARELLI, Università degli Studi di Udine, Udine, Italy
- 15.50 *FB-1:IL08* **Efficient Solar Water Splitting with a BiVO₄-Based Heterojunction Photoanode**
R. VAN DE KROL, **F.F. ABDI**, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Institute for Solar Fuels, Berlin, Germany
- 16.20 *FB-1:IL09* **The Productivity of Photobiological Water Splitting: Trading Time for Efficiency**
H.J.M. DE GROOT, Leiden Institute of Chemistry, Leiden University, The Netherlands
- 16.50 *FB-1:IL10* **TiS_x Nanoribbons: Hydrogen Storage and Photoelectrochemical Properties**
M. BARAWI MORAN¹, M. PONTIHIEU², J.R. ARES¹, F. CUEVAS², I.J. FERRER¹, J.F. FERNÁNDEZ¹, C. SÁNCHEZ¹, ¹Grupo MIRE, Dpto. Física de Materiales, Facultad de Ciencias, Universidad Autónoma de Madrid, Madrid, Spain; ²Equipe de Chimie Métallurgique des Terres Rares (CMTR) Institut de Chimie et des Matériaux, Paris Est (ICMPE) CNRS-UMR 7182, Thiais Cedex, France
- 17.10 *Break*

Sub-Session FB-2.2 - Complex Hydrides

Chair: B.C. HAUBACK, Norway

- 17.40 *FB-2.2:IL01* **Materials and Systems for Hydrogen Storage**
M. DORNHEIM, J. JEPSEN, F. KARIMI, N. BERGEMANN, C. PISTIDDA, S. BÖRRIES, J. BELLOSTA VON COLBE, A.-L. CHAUDHARY, K. TAUBE, G. SAHLMANN, N. BUSCH, O. METZ, C. HORSTMANN, T. KLASSEN, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany
- 18.10 *FB-2.2:L02* **Role of Gas Back Pressure in Dehydrogenation Reaction of LiBH₄-based Reactive Hydride Composites**
KEE-BUM KIM, J.-H. SHIM, I.-S. CHOI, Y.W. CHO, Korea Institute of Science and Technology, Seoul, Republic of Korea; K.-B. KIM, K.H. OH, Seoul National University, Seoul, Republic of Korea
- 18.30 *FB-2.2:L03* **In-situ Temperature Dependent Infrared Spectroscopy of Ammonia Borane Dehydrogenation**
N. BILISKOV, Rudjer Boskovic Institute, Division of Materials Chemistry, Laboratory of Solid State and Complex Compounds Chemistry, Zagreb, Croatia; D. VOJTA, Rudjer Boskovic Institute, Division of Organic Chemistry and Biochemistry, Laboratory of Molecular Spectroscopy, Zagreb, Croatia

Session FC-1 - Batteries

Room: **GIOVE**

Chair: **G.Z. CHEN, UK**

15.00 *FC-1:IL21* **Mesoporous TiO₂ as an Alternative Anode for Fast Chargeable Lithium-ion Battery**

P. BALAYA, National University of Singapore, Singapore

15.30 *FC-1:IL22* **Superionic Conducting Ceramic Electrolyte Enabling Lithium Metal Anodes and Solid State Batteries**

J. SAKAMOTO¹, T. THOMPSON¹, M. JOHANNES², A. HUQ³, J. ALLEN⁴, J. WOLFENSTINE⁴, I.N. DAVID¹, ¹Michigan State University, Chemical Engineering and Materials Science Department, East Lansing, MI, USA; ²Naval Research Laboratory/Center for Computational Materials Science, Anacostia, VA, USA; ³Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, USA; ⁴Army Research Laboratory, RDRL-SED-C, Adelphi, MD, USA

16.00 *FC-1:IL24* **Reaction Mechanism of High-energy Li-excess NMC Cathode Materials**

C. DELMAS¹, H. KOGA^{1,2}, L. CROGUENNEC¹, M. MÉNÉTRIÉ¹, S. BELIN³, C. GENEVOIS⁴, L. BOURGEOIS⁵, F. WEILL¹, ¹ICMCB-CNRS, Université de Bordeaux, IPB-ENSCBP, Pessac cedex, France; ²TOYOTA MOTOR EUROPE NV/SA, Zaventem, Belgium; ³Synchrotron Soleil - L'orme des Merisiers Saint Aubin, Gif-sur-Yvette, France; ⁴GPM, Université de Rouen, Saint Etienne du Rouvray; ⁵Université de Bordeaux, ISM, Talence, France

16.30 *Break*

Chair: **C. DELMAS, France**

17.00 *FC-1:L26* **Influence of Electrode Structure on The Performances of Li Ion Battery: From One Dimensional Nanostructured Electrode to Three Dimensional Nanoporous Electrodes**

XIN HUANG, HONG YU, QINGYU YAN, **HUEY HOON HNG**, School of Materials Science and Engineering, Nanyang Technological University, Singapore

17.20 *FC-1:L27* **The Electrochemical Performances of Li-Oxygen Batteries Based on LITFSI-Tetraglyme Electrolyte and Unmodified or Au-containing Carbon Cathodes**

M. MARINARO, U. RIEK, S. THEIL, L. JÖRISSEN, M. WOHLFAHRT-MEHRENS, Zentrum für Sonnenenergie- und Wasserstoff-Forschung, Baden-Württemberg, Ulm, Germany

17.40 *FC-1:L28* **Mussel-inspired Catechol Batteries**

EUN-OK HONG, HAESHIN LEE, Department of Chemistry, KAIST, Daejeon, Republic of Korea

18.00 *FC-1:L28b* **Amorphous Silicon Nanoparticles Synthesized by Inductive Coupled Plasma for Secondary Lithium-ion Battery**

BOYUN JANG, JOONSOO KIM, JINSOEK LEE, Korean Institute of Energy Research, Deajeon, Korea

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

Room: ORSA MINORE

Chair: T. MORI, Japan

15.00 *FD-2:IL09* **High Performance Thermoelectric Materials and their Applications in Energy Conversion**

ZHIFENG REN, University of Houston, Houston, TX, USA

15.30 *FD-2:IL10* **Synthesis of Silicides Using a Na flux and their Thermoelectric Properties**

T. YAMADA, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan

16.00 *Break*

Chair: B. BALKE, Germany

16.30 *FD-2:IL13* **Unconventional Superlattice-structured Bulk Thermoelectric Materials**

K. KOUMOTO, C.L. WAN, F. DANG, K. TSURUTA, Nagoya University, Japan; Y.F. WANG, Nanjing University of Technology, China; R.Z. ZHANG, Northwest University, China; W.S. SEO, KICET, Korea

17.00 *FD-2:L14* **Development of High ZT Skutterudites for Thermoelectric Applications**

G. ROGL^{1,2}, A. GRYSIV¹, E. BAUER¹, M. ZEHETBAUER², P. ROGL¹,
¹Christian Doppler Laboratory for Thermoelectrics, University and University of Technology, Vienna, Austria; ²Research Group Physics of Nanostructured Materials, University of Vienna, Austria

17.20 *FD-2:L15* **Lithium as a Dopant for p-type Mg₂Si**

P. NIERODA¹, A. KOLEZYNSKI², M. SITARZ², K.T. WOJCIECHOWSKI¹,
^{1,2}AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland, ¹Department of Inorganic Chemistry, Thermoelectric Research Laboratory, ²Department of Silicate Chemistry and Macromolecular Compounds

17.40 *FD-2:L16* **Nb-doped SrTiO₃ Thermoelectric Nanocomposite**

K. VANDAELE, P. VAN DER VOORT, K. DE BUYSSER, Department of Inorganic and Physical Chemistry, Ghent University, Gent, Belgium

Session FF-2 - Soft Magnetic Materials

Room: **TETTuccio (Hotel Tamerici)**

Chair: L.F. COHEN, UK

- 15.00 *FF-2:IL04* **New Soft Magnetic Materials for High Efficiency Applications**
R. HASEGAWA, Metglas, Inc., Conway, SC, USA
- 15.30 *FF-2:IL05* **Synthesis of Ferrite Magnets with Magnetization over 1 Tesla**
JUN DING, Department of Materials Science & Engineering, National University of Singapore, Singapore
- 16.00 *FF-2:L06* **Comprehensive Approach to Broadband Energy Losses in MN-ZN Ferrites**
F. FIORILLO, **C. BEATRICE**, O. BOTTAUSCIO, Istituto Nazionale di Ricerca Metrologica, Torino, Italy
- 16.20 *FF-2:IL07* **Field-annealed Soft Magnetic Amorphous and Nanocrystalline Ribbons with Improved Energy Performance**
I. SKORVANEK, Institute of Experimental Physics, Slovak Academy of Sciences, Kosice, Slovakia
- 16.50 *FF-2:L09* **The Effect of Compacting Pressure on Power Loss in a SMC**
B. SLUSAREK¹, J. SZCZYGLOWSKI², **K. CHWASTEK**², B. JANKOWSKI¹, ¹Tele and Radio Research Institute, Warsaw, Poland; ²Czestochowa University of Technology, Czestochowa, Poland
- 17.10 *Break*

Session FF-3 - Magnetocaloric and Multifunctional Magnetic Materials

Chair: G. SANDEMAN, UK

- 17.40 *FF-3:IL01* **Caloric Effects in Ferroic Materials**
L. MANOSA, Facultat de Física, Universitat de Barcelona, Barcelona, Spain
- 18.10 *FF-3:L02* **Enhancing the Inverse Magnetocaloric Effect by Proper Doping Ni-Co-Mn-Ga(In) Heusler Alloys**
S. FABBRICI, MIST-ER Laboratory, Bologna, Italy; F. ALBERTINI, F. BOLZONI, R. CABASSI, IMEM-CNR, Parma, Italy; G. PORCARI, F. CUGINI, M. SOLZI, University of Parma, Parma, Italy; J. KAMARAD, Z. ARNOLD, Institute of Physics - AVCR, Prague, Czech Republic; B. EMRE, S. YUCE, L. MANOSA, A. PLANES, Universitat de Barcelona, Barcelona, Catalonia, Spain
- 18.30 *FF-3:IL03* **Shape Memory and Magnetocaloric Materials: “Giant” Effects Induced by Hydrostatic Pressure and Magnetic Field**
Z. ARNOLD, J. KAMARAD, J. KASTIL, Institute of Physics, AS CR, Prague, Czech Republic; F. ALBERTINI, IMEM-CNR, Parma, Italy; S. FABBRICI, IMEM-CNR, Parma and MIST E-R Lab. Bologna, Italy; Y. SKOURSKI, Hochfeld-Magnetlabor Dresden, Dresden, Germany
- 19.00 *FF-3:L04* **Revealing and Modelling Interactions or Disorder Effects in Magnetocaloric Materials**
J.S. AMARAL*, J.N. GONÇALVES, **V.S. AMARAL**, Depto de Física e CICECO, Universidade de Aveiro, Aveiro, Portugal; *also at IFIMUP-IN e Depto de Física e Astronomia da Faculdade de Ciências da Universidade do Porto, Porto, Portugal

Session FG-3 - Emerging Technologies and New Concepts

Room: **ZENITH**

Chair: J.L. DELGADO, Spain

- 15.00 *FG-3:IL05* **Design of Molecular Donors for Organic Photovoltaics: Smaller Structures for Great Ambitions**
J. RONCALI, Group Linear Conjugated Systems, CNRS Moltech-Anjou, University of Angers, Angers, France
- 15.30 *FG-3:IL06* **New Pi-extended Building Blocks for Polymer Photovoltaics**
K. TAKIMIYA, I. OSAKA, Emergent Molecular Function Research Group, RIKEN Center for Emergent Matter Science (CEMS), Wako, Saitama, Japan
- 16.00 *FG-3:L08* **The New Concept of Hybrid Perovskites for Photovoltaics: Understanding and Design by First-principles Calculations**
A. FILIPPETTI, A. MATTONI, CNR-IOM UOS Cagliari, c/o Dipartimento di Fisica, University of Cagliari, Monserrato (CA), Italy
- 16.20 *Break*

Chair: J. RONCALI, France

- 16.50 *FG-3:IL10* **New Concepts in Organic Photovoltaics**
G. LANZANI, CNST@POLIMI, Istituto Italiano di Tecnologia e Department of Physics, Politecnico di Milano, Milan, Italy
- 17.20 *FG-3:IL12* **Coherent Electronic Energy Transfer and Organic Photovoltaics**
E. COLLINI, Dipartimento di Scienze Chimiche, Università di Padova, Padova, Italy

Session FH-2 - Material Design and Characterization

Room: **VENERE**

Chair: **R.T. COLLINS, USA**

- 15.00 *FH-2:IL10* **Combinatorial Synthesis and Thin Film Deposition of Transparent Conductors and Semiconductors**
J.D. PERKINS, A. ZAKUTAYEV, J.J. BERRY, P.A. PARILLA, M.A.F.M. VAN HEST, T. GENNETT, D.S. GINLEY, National Renewable Energy Laboratory, Golden, CO, USA
- 15.30 *FH-2:IL11* **Efficiency Improvement of n-Oxide Semiconductor/p-Cu₂O Heterojunction Solar Cells Fabricated on Thermally Oxidized Cu₂O Sheets**
T. MIYATA, Y. NISH, T. MINAMI, Optoelectronic Device System R&D Center, Kanazawa Institute of Technology, Ishikawa, Japan
- 16.00 *FH-2:L12* **Structural, Electrical and Optical Properties of Nanostructured Ta-doped TiO₂**
P. MAZZOLINI^{1, 2}, P. GONDONI¹, C.S. CASARI^{1, 2}, A. LI BASSI^{1, 2}, ¹Dipartimento di Energia and NEMAS - Center for NanoEngineered Materials and Surfaces, Politecnico di Milano, Milano, Italy; ²Center for Nano Science and Technology @PoliMI, Istituto Italiano di Tecnologia, Milano, Italy
- 16.20 *FH-2:L13* **Structural, Electrical and Optical Characteristics of Spin-coated ZnO-based Transparent Thin Films**
N. VOROBYEVA, M. RUMYANTSEVA, R. VASILIEV, V. KOZLOVSKIY, YU. SOSHNIKOVA, D. FILATOVA, A. GASKOV, Chemistry Department, Moscow State University, Moscow, Russia
- 16.40 *FH-2:L14* **Nano- and Mesoscale Engineering of Al-doped ZnO by Pulsed Laser Deposition: Towards Flexible Scattering Electrodes**
P. GONDONI¹, P. MAZZOLINI^{1, 2}, V. RUSSO¹, C.E. BOTTANI^{1, 2}, A. LI BASSI^{1, 2}, C.S. CASARI^{1, 2}, ¹Dipartimento di Energia and NEMAS - Center for NanoEngineered Materials and Surfaces, Politecnico di Milano, Milano, Italy; ²Center for Nano Science and Technology @PoliMI, Istituto Italiano di Tecnologia, Milano, Italy
- 17.00 *Break*

Session FH-1 - Fundamentals

Room: **VENERE**

Chair: K. ELLMER, Germany

17.30 *FH-1:IL07* **First Principles Theory of Transparent Crystalline and Amorphous Oxide Conductors and Semiconductors**
J. MEDVEDEVA, Department of Physics, Missouri University of Science and Technology, Rolla, MO, USA

18.00 *FH-1:L08* **Finding Low Hole Effective Masses p-type Transparent Conducting Oxides through High-throughput Computing**
G. HAUTIER, A. MIGLIO, G. CEDER¹, G.-M. RIGNANESE, X. GONZE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium; ¹Massachusetts Institute of Technology, USA

18.20 *FH-1:L09* **Atomic and Electronic Structures of Various Phases of Zinc Tin Oxides by Ab-initio Calculations**
JOOHWI LEE, **JUNG-HAE CHOI**, Electronic Materials Research Center, Korea Institute of Science and Technology, Seoul, South Korea; DEOK-YONG CHO, CFI-CES, Institute for Basic Science, and Department of Physics and Astronomy, Seoul National University, Seoul, South Korea; JISIM JUNG, UN KI KIM, SANG-HO RHA, CHEOL SEONG HWANG, WCU Hybrid Materials Program, Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, Seoul, South Korea

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

Room: **GUTTUSO (Hotel Croce di Malta)**

Chair: THAK SANG BYUN, USA

- 15.00 *FJ-1:L05* **Study on the Fabrication and Joining Technologies of Ferritic/Martensitic ODS Steel Structural Components for Future Fast Reactor Applications**
SUK HOON KANG, SANGHOON NOH, YOUNG-BUM CHUN, JINSUNG JANG, TAE KYU KIM, Nuclear Materials Division, Korea Atomic Energy Research Institute, Daejeon, Republic of Korea
- 15.20 *FJ-1:L06* **Crystallographic Relationship of Y₂Ti₂O₇ Particles with Matrix in Austenitic ODS Steels**
JINSUNG JANG, XIAODONG MAO, CHANG HEE HAN, TAE KYU KIM, Nuclear Materials Division, Korea Atomic Energy Research Institute, Daejeon, Korea
- 15.40 *FJ-1:L07* **Behavior at High Temperature of Metallic Liners (Ta, Nb) Used in the Sandwich Cladding Material of the GFR**
L. CHARPENTIER, M. BALAT-PICHELIN, PROMES-CNRS, Odeillo, France
- 16.00 *FJ-1:L08* **Investigation of Mechanical and Corrosion Properties of Ni-based Alloy for VHTR at 950 °C with Alloying Element and Heat Treatment**
DONG-JIN KIM, SU JIN JUNG, BYUNG HAK MOON, SUNG WOO KIM, YUN SOO LIM, HONG PYO KIM, Nuclear Materials Division, Korea Atomic Energy Research Institute (KAERI), Yuseong, Daejeon, Korea
- 16.20 *Break*

Session FJ-4 - Functional Materials

Chair: G. PINTSUK, Germany

- 16.50 *FJ-4:IL01* **Utilization Research and Development of Hydride Materials in Fast Reactors**
K. KONASHI, Tohoku University, Ibaraki, Japan
- 17.20 *FJ-4:IL03* **In-reactor and In-situ Studies of Dynamic Radiation Effects in Materials for Burning Nuclear Fusion Systems**
T. SHIKAMA, Institute for Materials Research, Tohoku University, Katahira, Sendai, Japan
- 17.50 *FJ-2:L04* **Depleted Uranium as Hydrogen Storage Material**
M. YAMAWAKI, Y. ARITA, T. YAMAMOTO, F. NAKAMORI, University of Fukui, Tsuruga-shi, Fukui, Japan; K. OHSAWA, Kyushu University, Japan

Session FK-2 - Structural Characterization

Room: **URANO**

Chair: **B. REZEK**, Czech Republic

- 15.00 *FK-2:IL06* **Time-resolved Optoelectronic Characterization of Graphene-based Nanoscale Circuits**
A. HOLLEITNER, Walter Schottky Institut and Physik-Department, Technische Universität München, Garching, Germany
- 15.30 *FK-2:IL07* **Growth, Structure, and Properties of Carbon Nanomaterials Studied by In-situ Electron Microscopy**
F. BANHART, O. CRETU, J.A. RODRIGUEZ-MANZO, Institut de Physique et Chimie des Matériaux de Strasbourg, UMR 7504, Université de Strasbourg, CNRS, Strasbourg, France
- 16.00 *FK-2:IL09* **X-ray Diffraction and Small Angle X-ray Scattering for Characterization of Carbon Nanostructures**
M.V. BAIDAKOVA, A.T. DIDEIKIN, A. YA. VUL, Ioffe Physical-Technical Institute, St. Petersburg, Russia
- 16.30 *FK-2:IL10* **Endohedral Fullerenes: the Importance of Size, Shape and Electronic Complementarity between Encapsulated Clusters and Cages**
L. ECHEGOYEN, University of Texas-El Paso, El-Paso, TX, USA
- 17.00 *FK-2:L13* **Clusterization of Shungite Nonplanar Graphenes in Water and its Hybrids**
N.N. ROZHKOVA¹, S.S. ROZHKOV¹, A.A. MIKHAILINA¹, E.F. SHEKA², ¹Institute of Geology Karelian Research Centre RAS, Petrozavodsk, Russia; ²Peoples' Friendship University of Russia, Moscow, Russia
- 17.20 *Break*

Session FK-1 - Growth and Processing

Chair: **L. TAPASZTO**, Hungary

- 17.50 *FK-1:L12* **Macro-mesoporous Nanocarbon Thin Films. Processing and Application to Energy Storage**
M. ES-SOUNI, D. SHOPF, Institute for Materials & Surface Technology, University of Applied Sciences, Kiel, Germany
- 18.10 *FK-1:L13* **Designing and Guiding the Synthesis of a New Class of Fullerene-like C-based Nanostructured Compounds**
C. GOYENOLA, S. SCHMIDT, S. STAFSTRÖM, L. HULTMAN, **G.K. GUEORGUIEV**, Department of Physics, Chemistry, and Biology - IFM, Linköping University, Linköping, Sweden
- 18.30 *FK-1:L14* **CVD of N-Doped Graphene**
H. SACHDEV, Max Planck Institut für Polymerforschung, Mainz, Germany
- 18.50 *FK-1:L15* **Spectral Tuning of Graphene Quantum Dots by Salt-ing Out**
KYUEUI LEE, SEONGWOO RYU, HAESHIN LEE, Dept. of Chemistry, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Rep. of Korea; SOON HYUNG HONG, The Graduate School of Nanoscience and Technology (WCU), Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Rep. of Korea

Session FL-1 - Mass and Charge Transport Mechanisms

Room: **BARZAGLI (Hotel Croce di Malta)**

Chair: J. JAMNIK, Slovenia

- 15.00 *FL-1:IL12* **Capillary-driven Interdiffusion Along Interphase Boundaries in Solids**
E. RABKIN, D. AMRAM, L. KLINGER, Dept. of Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa, Israel
- 15.30 *FL-1:L14* **Formalism for the Measurement of Tracer Diffusion and Interdiffusion Coefficients in a Single Experiment**
I.V. BELOVA, G.E. MURCH, University of Newcastle, NSW, Australia; N.S. KULKARNI, Oak Ridge National Laboratory, TN, USA; Y. SOHN, University of Central Florida, FL, USA
- 15.50 *FL-1:L15* **Vacancy Diffusion under a Stress and Kinetic of Nanovoid Growth in Cubic Metals**
A.V. NAZAROV, National Research Nuclear University (MEPhI), Moscow, Russia; A.A. MIKHEEV, Moscow State University of Design and Technology, RUSSIA; A.G. ZALUZHNYI, SSC RF Institute for Theoretical and Experimental Physics (ITEP), Moscow, Russia
- 16.10 *FL-1:L16* **Silicon Spin Diffusion Length Measured in Local Configuration under Field Emission Regime**
C.I. LEVARTOSKI DE ARAUJO, Departamento de Física, Universidade Federal de Viçosa, MG, Brazil; M.A. TUMELEIRO, Departamento de Física, Universidade Federal de Santa Catarina, SC, Brazil; A.A. PASA, Departamento de Física, Universidade Federal de Santa Catarina, SC, Brazil
- 16.30 *Break*

Chair: E. RABKIN, Israel

- 17.00 *FL-1:IL17* **Percolation of Electronic and Ionic Carrier in Single Phase Materials**
S. YAMAGUCHI¹, DONGYOUNG KIM², T. TSUCHIYA³, S. MIYOSHI¹, Y. SHIBUYA¹, ¹Dept. Materials Engg., School of Engg., The University of Tokyo, Tokyo, Japan; ²Samsung Research Center, Korea; ³MANA, NIMS, Japan
- 17.30 *FL-1:IL18* **Atomistic Modelling of Diffusion Processes of Light Elements in Metals**
J. ROGAL, R. DRAUTZ, ICAMS, Ruhr-Universität Bochum, Bochum, Germany
- 18.00 *FL-1:L20* **Conductivity Manipulation of Metal Single Crystals by Grain Boundary Control and Impurity Doping**
SE-YOUNG JEONG, Dept. Cogno-Mechatronics Engineering, Pusan National University, Miryang, Rep. of Korea; J.Y. KIM, C.-R. CHO, Dept. Nano Fusion Technology, Pusan National University, Miryang, Rep. of Korea; M.-W. OH, Fundamental and Creativity Research Div., Korea Electrotech. Research Inst., Changwon-si, Rep. of Korea; S. LEE, The Inst. of Basic Science, Korea University, Seoul, Rep. of Korea; Y.C. CHO, Crystal Bank Research Inst., Pusan National University, Miryang, Rep. of Korea; J.-H. YOON, Busan Center, Korea Basic Science Inst., Busan, Rep. of Korea; G.W. LEE, Korea Research Inst. of Standards and Science & Dept. of Science of Measurement, University of Science and Technology, Daejeon, Rep. of Korea; C.H. PARK, Dept. of Physics Education & RCDAMP, Pusan National University, Busan, Rep. of Korea

Session FM-2 - Phase Change Memories (PCM)

Room: **ALBA 2**

Chair: M. BERNASCONI, Italy

- 15.00 *FM-2:IL09* **Phase Change Memory Nano-scale Evolution**
R. BEZ, A. PIROVANO, Micron, Agrate Brianza, Italy
- 15.30 *FM-2:IL10* **Spin Control and Storage using [(GeTe)_x(Sb₂Te₃)_yz] Interfacial Phase Change Memory**
J. TOMINAGA, Y. SAITO, K. MAKINO, X. WANG, A. KOLOBOV, P. FONS, T. NAKANO, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; S. MURAKAMI, Tokyo Institute of Technology, Meguro, Tokyo, Japan; H. AWANO, Toyota Technological Institute, Nagoya, Japan; M. HASE, Tsukuba University, Tsukuba, Japan; Y. TAKAGAKI, Paul-Drude Institute, Berlin, Germany
- 16.00 *FM-2:L11* **Structural and Electrical Properties of [(SiTe)_x(Sb₂Te₃)_yz] Interfacial Phase Change Memory**
Y. SAITO, J. TOMINAGA, K. MAKINO, X. WANG, A. KOLOBOV, P. FONS, T. NAKANO, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan
- 16.20 *Break*

Session FM-3 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

Chair: T. MIKOLAJICK, Germany

- 16.50 *FM-3:IL02* **On the Origin of Ferroelectric Resistive Switching in BiFeO₃ Thin Films**
S. FAROKHIPOOR, **B. NOHEDA**, Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands
- 17.20 *FM-3:IL03* **Ferroelectric Memories based on Resistive Switching**
A. GRUVERMAN, Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, USA
- 17.50 *FM-3:IL04* **Recent Developments in Manipulating Domain Wall Motion in Wires with Perpendicular Anisotropy**
D. RAVELOSONA, CNRS/Université Paris Sud, Orsay, France

Session FM-4 - Memristive Materials, Devices and Emerging Applications

- 18.20 *FM-4:IL02* **Novel Functions Achieved by Atom/Ion Movement Controlled Devices**
T. HASEGAWA, M. AONO, WPI Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Tsukuba, Japan

Session FN-3 - Properties of Semiconductors (of Any Types)

Room: **TORRETTA (Hotel Tamerici)**

Chair: J.Y.T. WEI, Canada

- 15.00 *FN-3:IL01* **Static to Dynamical Antiferromagnetic Correlation in Electron-doped Cuprate Superconductors Studied by ARPES**
A. FUJIMORI, Dept. of Physics, University of Tokyo, Tokyo, Japan
- 15.30 *FN-3:IL02* **Charge Order Driven by Fermi-arc Instability in Underdoped Cuprates**
A. DAMASCELLI, University of British Columbia, Vancouver, Canada
- 16.00 *FN-3:IL03* **Designer Dirac Electronic and Superconducting Materials Synthesized via Scanning Tunneling Microscope Quantum Assembly**
H.C. MANOHARAN, Stanford University, Dept. of Physics, Stanford, CA, USA
- 16.30 *Break*

Session FN-4 - Theory and Mechanisms (for Normal and Superconducting States)

Chair: A. BANSIL, USA

- 17.00 *FN-4:IL01* **Spin-Polarised Supercurrents: A Paradigm Shift for Spintronics**
J.W.A. ROBINSON¹, A. DI BERNARDO¹, T. HIGGS¹, A. WELLS¹, N. BANERJEE¹, M. EGILMEZ, M.G. BLAMIRE¹, Y. KALCHEIM², O. MILLO², ¹Department of Material Science and Metallurgy, University of Cambridge, Cambridge, UK; ²Racah Institute of Physics and the Hebrew University Center for Nanoscience and Nanotechnology, The Hebrew University of Jerusalem, Jerusalem, Israel
- 17.30 *FN-4:IL02* **Peeping at Pairing Interactions with Coherent Charge Fluctuation Spectroscopy**
J. LORENZANA, Institute for Complex Systems - CNR and Physics Department, Sapienza, University of Rome, Italy; B. MANSART, A. MANN, A. ODEH, M. CHERGUI, F. CARBONE, EPFL, Lausanne, Switzerland

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

- 18.00 *FN-1:IL08* **Fe-vacancy Order and Superconductivity in Tetragonal β -Fe_{1-x}Se**
TA-KUN CHEN¹, CHUNG-CHIEH CHANG¹, HSIAN-HONG CHANG², AI-HUA FANG¹, CHIH-HAN WANG¹, WEI-HSIANG CHAO¹, CHUAN-MING TSENG¹, YUNG-CHI LEE^{1,3}, YU-RUEI WU¹, MIN-HSUEH WEN¹, HSIN-YU TANG^{4,5}, FU-RONG CHEN^{1,4}, MING-JYE WANG^{1,2}, **MAW-KUEN WU**^{1,3,6}, DIRK VAN DYCK⁵, ¹Institute of Physics, Academia Sinica, Taipei, Taiwan; ²Institute of Astronomy and Astrophysics, Academia Sinica, Taipei, Taiwan; Departments of ³Physics and ⁴Engineering and System Science, National Tsing Hua University, Hsinchu, Taiwan; ⁵Electron Microscopy for Materials Science, Department of Physics, University of Antwerp, Antwerp, Belgium; ⁶Department of Physics, National Dong Hwa University, Hualien, Taiwan

Session FO-2 - Enabling Tools

Room: SIRIO

Chair: Y. IWASAKI, Japan

15.00 *FO-2:IL01* **Cell Manipulation and Processing using Inkjet Printing**

B. DERBY, R. DOU, R.E. SAUNDERS, School of Materials, University of Manchester, UK; C. WARD, School of Dentistry, University of Manchester, UK

15.30 *FO-2:IL02* **Miniaturized CMOS Imaging Devices to Measure Brain Neural Activities of Freely-moving Mice**

J. OHTA, Graduate School of Materials Science, Nara Institute of Science and Technology, Ikoma, Japan

16.00 *FO-2:IL03* **Understanding Interactions of Nanomaterials with Biological Environment: Insights from Simulations**

I. YAROVSKY, Health Innovations Research Institute, RMIT University, Melbourne, Australia

16.20 *Break*

Chair: B. DERBY, UK

16.35 *FO-2:IL05* **Separation of Cells in Multiphase Systems**

O. AKBULUT, Z.P. GUVEN, G. AVCI, M. COKOL, Sabanci University, Istanbul, Turkey

16.55 *FO-2:IL06* **Surface Modulation of Carbohydrate Ligands on Cells Using Polymerization Technique**

Y. IWASAKI, M. SAKIYAMA, S. FUJII, Department of Chemistry and Materials Engineering, Kansai University, Suita, Osaka, Japan

17.25 *FO-2:IL08* **Smart Biomaterials for DNA Analyzing Tools**

M. MAEDA, Bioengineering Laboratory, RIKEN Institute, Wako, Saitama, Japan

17.55 *Break*

Session FO-4 - Tissue Engineering and Regenerative Medicine

Chair: I. YAROVSKY, Australia

18.20 *FO-4:IL02* **Next Generation Materials for Hard and Soft Tissue Repair**

S. BEST, Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, UK

18.50 *FO-4:IL03* **Regenerative Engineering: The Regeneration of Complex Human Tissues**

C.T. LAURENCIN, R. JAMES, University of Connecticut Health Center, Institute for Regenerative Engineering, Farmington, CT, USA

Session FO-8.1 - Shape-memory and Shape-changing Polymers for Biomedical Applications

Room: **ORSA MAGGIORE**

Chair: A. LENDLEIN, Germany (*Programme Chair*)

15.00 *Welcome*

15.10 *FO-8.1:IL03* **Shape-memory Nanopatterns Direct Cell Orientation**

M. EBARA, K. UTO, T. AOYAGI, National Institute for Materials Science (NIMS), Tsukuba, Japan

15.40 *FO-8.1:IL02* **Degradable Shape Memory Polymers for Orthopedic Applications**

JIE SONG, JIANWEN XU, T. FILION, A. KUTIKOV, Department of Orthopedics & Physical Rehabilitation, Department of Cell & Developmental Biology, University of Massachusetts Medical School, Worcester, MA, USA

16.10 *FO-8.1:L04* **Scaffold Roughness Regulates the Endothelial Differentiation of Human Adipose Derived Mesenchymal Stem Cells**

ZHENG DONG LI^{1,2}, WEIWEI WANG¹, K. KRATZ^{1,3}, XUN XU^{1,2}, M. ROCH¹, A. KURTZ¹, M. GOSSEN¹, F. JUNG^{1,3}, **NAN MA**^{1,3}, A. LENDLEIN^{1,3}, ¹Institute of Biomaterial Science and Berlin-Brandenburg Centre for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany; ²Institute of Chemistry and Biochemistry, Free University of Berlin, Berlin, Germany; ³Helmholtz Virtual Institute - Multifunctional Materials in Medicine, Berlin and Teltow, Germany

16.30 *FO-8.1:IL01* **Thermally Activated Shape Memory Polymers**

D.J. MAITLAND, T. LANDSMAN, Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA

17.00 *Break*

Chair: M. EBARA, Japan

17.30 *FO-8.1:IL05* **Shape-changing Materials for Basic and Applied Mechanobiology**

J.H. HENDERSON, Syracuse University, Syracuse, NY, USA

18.00 *FO-8.1:IL07* **Reversible Actuation of Polymer Networks by Directed Crystallization**

M. BEHL, K. KRATZ, U. NÖCHEL, A. LENDLEIN, Institute of Biomaterial Science and Berlin-Brandenburg Center for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany

18.30 *FO-8.1:IL06* **Shape Memory Polymer Foams for Medical Device Applications**

T.S. WILSON, Physical and Life Sciences Directorate, Lawrence Livermore National Laboratory, Livermore, CA, USA; A. BOYLE, Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA

19.00 *FO-8.1:L08* **Amphiphilic Shape Recovery Functional Nanocellulose Aerogels**

YOU-LO HSIEH, FENG JIANG, Fiber and Polymer Science, University of California, Davis, CA, USA

Session FA-1 - Solid Oxide (SOFCs) and Molten Carbonate (MCFCs) Fuel Cells

Room: **AUDITORIUM**

Chair: N. CHRISTIANSEN, Denmark

9.00 FA-1:IL10 High Temperature Fuel Cells: Materials Issues and New Concepts

M. CASSIR, Institut de Recherche de Chimie Paris, IRCP, UMR8247 Chimie ParisTech - CNRS, Paris, France

9.30 FA-1:L12 ETRERA_2020 - A project for an Euro-Mediterranean RES, Hydrogen and Fuel Cells Deployment

G. SQUADRITO¹, A. NICITA¹, A. SORACI², P. MAZZUCHELLI³, E. STAMATAKIS⁴, I. IBRIK⁵, R. SANDERS⁶, A. ZAKARYA⁷, M. MACHMOUM⁸, H. GORGUN⁹, B. DAG¹⁰, H. HAMDI¹¹, D. MARTINEZ CALLEJA¹², ¹CNR - ITAE, Messina, Italy; ²INNOVA BIC, Messina, Italy (project coordinator); ³European Renewable Energy Centre Agency, Brussels, Belgium; ⁴Kemtro Ananeosimon Pigon Ke Exikonomisis Energeias - CRES, Pikermi/Athens, Grece; ⁵An-Najah National University, Omar Ibn Khatab Street Nablus Palestinian-Administered Areas; ⁶European Business and Innovation Network, Brussels, Belgium; ⁷Centre de Recherche et de Technologie de l'Energie, Technopole Borj Cedria, Tunis Hammam Lif, Tunisia; ⁸Université De Nantes, Saint Nazaire, France; ⁹Yildiz Technical University, Faculties of Electrical A 101, Esenler/Istanbul, Turkey; ¹⁰Türkiye Bilimsel Ve Teknolojik Arastirma Kurumu TUBITAK, Odtu Kampus/Sogutozu, Ankara, Turkey; ¹¹Université Cadi Ayyad, Bb Prince MY Abdellah, Marrakech, Morocco; ¹²Asociation Madrid Network, Madrid, Spain

9.50 Break

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

Chair: QINGFENG LI, Denmark

10.20 FA-2:IL14 Proton- and Hydroxide-conducting Polymer Electrolytes for Electrochemical Energy Technologies

M.L. DI VONA, Univ. Roma Tor Vergata, Dip. Scienze e Tecnologie Chimiche, Roma, Italy

10.50 FA-2:L15 Influence of Acid Loss in PBI-based HT-PEM Fuel Cells during Long-term Operation

N. BRUNS, M. RASTEDT, F.J. PINAR PÉREZ, P. WAGNER, NEXT ENERGY- EWE Research Centre for Energy Technology, Oldenburg, Germany

11.10 FA-2:L17 Hydration and Proton Conductivity of Proton-conducting Ionomers

P. KNAUTH, Aix Marseille University, CNRS, UMR 7246, Marseille, France

11.30 FA-2:L18 Evaluation of Titanium Oxide in the Electrode Structure for Portable PEFCs Applications

I. GATTO, A. CARBONE, A. SACCA, R. PEDICINI, E. PASSALACQUA, CNR-ITAE, Messina, Italy

Sub-Session FB-2.2 - Complex Hydrides

Room: **LE PLEIADI**

Chair: M. DORNHEIM, Germany

- 9.00 *FB-2.2:IL04* **Potential and Limitation of Complex hydrides for Hydrogen Storage**
A. ZÜTTEL, EMPA, Dübendorf, Switzerland; SHIN-ICHI ORIMO, Tohoku University, Sendai, Japan
- 9.30 *FB-2.2:IL05* **Improved Dehydrogenation Properties of the Mg(NH₂)₂-2LiH System**
H.J. CAO, J.H. WANG, Z.T. XIONG, G.T. WU, **PING CHEN**, Dalian Institute of Chemical Physics (CAS), Dalian, China
- 10.00 *FB-2.2:IL06* **Structural Characterisation of Complex Hydrides**
B.C. HAUBACK, C. FROMMEN, M.H. SORBY, Institute for Energy Technology, Physics Department, Kjeller, Norway
- 10.30 *FB-2.2:IL07* **Interface Reactions Influences the Reaction Path of Hydride Composite**
A. BORGSCHULTE, S. KATO, A. ZÜTTEL, **E. CALLINI**, Empa, Laboratory Hydrogen & Energy, Dübendorf, Switzerland
- 11.00 *Break*

Sub-Session FB-2.3 - Chemical Hydrides

Chair: PING CHEN, China

- 11.30 *FB-2.3:IL01* **Hydrogen Production from Sodium Borohydride Hydrolysis: A Density Functional Theory Study**
PING LI, G. HENKELMAN, **J.K. JOHNSON**, University of Pittsburgh, Pittsburgh, PA, USA; University of Texas at Austin, USA
- 12.00 *FB-2.3:L03* **Mixed Metal Ammine Complexes for Hydrogen Storage**
D. BLANCHARD, P. B. JENSEN, T. VEGGE, Department of Energy Conversion and Storage, DTU, Roskilde, Denmark; A. KLUKOWSKA, U. QUADE, Amminex Emissions Technology A/S, Søborg, Denmark

Session FC-1 - Batteries

Room: **GIOVE**

Chair: **S. OKADA**, Japan

- 9.00 *FC-1:IL29* **Sintering of Monolithic “All-Solid-State” Batteries**
L. CASTRO, CEMES, Toulouse, France; A. KUBANSKA, L. TORTET, MADIREL, Marseille, France; R. BOUCHET, LEPMI, Grenoble, France; V. SEZNEC, V. VIALLET, LRCS, Amiens, France; C. JORDY, G. CAILLON, SAFT, Bordeaux, France; **M. DOLLÉ**, University of Montreal, QC, Canada
- 9.30 *FC-1:IL30* **Novel Monolithic Lithium Cassette as Replaceable Anode/Separator for Li-Air Semi-fuel Cell - A Concept of Plug and Use Galvanic Cell**
S.R.S. PRABAHARAN, School of Electronics Engineering, VIT University, Chennai Campus, India; J. KAWAMURA, N. KUWATA, Institute of Multidisciplinary Research for Advanced Materials (IM-RAM), Tohoku University, Sendai, Japan; M.S. MICHAEL, Chemical Sciences Research Centre, SSN College of Engineering, SSN Nagar, Chennai, India
- 10.00 *FC-1:L31* **High-energy, High-power Lithium-sulfur Batteries**
A. MANTHIRAM, YONGZHU FU, YU-SHENG SU, CHENXI ZU, SHENG-HENG CHUNG, Materials Science and Engineering Program, The University of Texas at Austin, Austin, TX, USA
- 10.20 *Break*

Session FC-2 - Supercapacitors

Chair: **M. SALANNE**, France

- 10.50 *FC-2:IL01* **Layered Oxides for Pseudocapacitive Energy Storage**
X. PETRISSANS, D. GIAUME, **P. BARBOUX**, Institut de Recherche de Chimie Paris-CNRS UMR7574, Paris, France
- 11.20 *FC-2:IL03* **Electrolytes for Higher Performance Carbon-Based Supercapacitors**
HSI-SHENG TENG, H.C. HUANG, M.F. HSUEH, Department of Chemical Engineering, National Cheng Kung University, Tainan, Taiwan
- 11.50 *FC-2:L05* **Effect of Cation on Diffusion Coefficient of Ionic Liquids at Onion-like Carbon Electrodes**
K. VAN AKEN¹, J.K. MCDONOUGH¹, SONG LI², GUANG FENG², S.M. CHATHOTH^{3,5}, E. MAMONTOV³, P.F. FULVIO⁴, P.T. CUMMINGS², SHENG DAI⁴, Y. GOGOTSI¹, ¹Department of Materials Science and Engineering & A.J. Drexel Nanotechnology Institute, Drexel University, Philadelphia, PA, USA; ²Department of Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, USA; ³Chemical and Engineering Materials Division, Neutron Sciences Directorate, Oak Ridge National Laboratory, Oak Ridge, TN, USA; ⁴Chemical Science Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA; ⁵Department of Physics and Materials Science, City University of Hong Kong, Hong Kong, China

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

Room: **ORSA MINORE**

Chair: K. KOUMOTO, Japan

- 8.30 *FD-2:IL17* **Tuning Thermoelectric Properties of TiS₂ Compounds through Intercalation, Mass Fluctuation, and Non-stoichiometry**
E. GUILMEAU¹, M. BEAUMALE¹, T. BARBIER¹, O. LEBEDEV¹, Y. BRÉARD¹, S. HÉBERT¹, Y. KINEMUCHI², A. MAIGNAN¹, ¹CRISMAT Lab., UMR 6508 CNRS-ENSICAEN, Caen, France; ²AIST Chubu, Nagoya, Japan
- 9.00 *FD-2:IL18* **Phase Separation as the Key to Thermoelectric Highly Efficient Heusler Compounds**
B. BALKE, Johannes Gutenberg University, Mainz, Germany
- 9.30 *FD-2:L19* **Fine Bi Wires Prepared by the Glass Coated Melt Spinning Method**
H. KOHRI, T. YAGASAKI, Kogakuin University, Hachioji, Tokyo, Japan
- 9.50 *FD-2:L20* **Temperature Influence on the Purity, Crystallographic Structure and Thermoelectric Properties of Cu₁₂Sb₄S₁₃ Substituted Tetrahedrite Compounds**
P. LEMOINE, T. BARBIER, S. GASCOIN, O. LEBEDEV, E. GUILMEAU, CRISMAT Laboratory, ENSICAEN-CNRS UMR 6508, Caen, France; A. KALTZOGLU, A. POWELL, University of Reading, Reading, UK
- 10.10 *FD-2:L21* **Targeted Use of SPS Method for Improvement of Thermoelectrics**
L.P. BULAT¹, I.A. NEFEDOVA¹, D.A. PSHENAY-SEVERIN², ¹ITMO University, St. Petersburg, Russia; ²Ioffe Physical Technical Institute, St. Petersburg, Russia
- 10.30 *Break*

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

Chair: T. CAILLAT, France

- 11.00 *FD-3:IL01* **High Efficiency Thermoelectric Topping Cycle Systems**
A. SHAKOURI, K. YAZAWA, Purdue University, West Lafayette, IN, USA; A. SILAEN, BIN WU, DONG FU, CHENN ZHOU, Purdue University Calumet, USA
- 11.30 *FD-3:IL03* **High Temperature Thermoelectric Generators for Automotive Applications**
J.D. KÖNIG, Fraunhofer Institute for Physical Measurement Techniques IPM, Thermoelectric Energy Converters, Freiburg, Germany
- 12.00 *FD-3:IL04* **Nanotechnology to Unlock the Multi-billion Dollar Potential of Thermoelectricity**
R.J. MEHTA¹, G. RAMANATH^{1,2}, T. BORCA-TASCIUC^{1,2}, R. FREDERICK¹, ¹ThermoAura Inc., Rensselaer, NY, USA; ²Rensselaer Polytechnic Institute, Troy, NY, USA

Session FE-2 - Advances in Fundamental Mechanism Understanding

Room: **VENERE**

Chair: L. KAVAN, Czech Republic

- 9.00 *FE-2:IL06* **On the Mechanism of the Photoactivity under Visible Light of N-doped Titanium Dioxide and Analogous Systems (third generation photoactive systems)**
E. GIAMELLO, Dip. di Chimica, Università di Torino, Torino, Italy
- 9.30 *FE-2:IL07* **Bimetallic PdxPt1-x/TiO2 Photocatalysts for Enhanced Simultaneous Removal of CO and VOC in the Presence of Humidity: Structural and Electronic Effects**
O. ROSSELER¹, A. LOUVET², V. KELLER¹, **N. KELLER¹**, ¹Inst.de Chimie et Procédés pour l'Energie, l'Environnement et la Santé (ICPEES), CNRS, Univ. Strasbourg, France; ²Direction Générale de L'Armement (DGA), DGA CBRN Expertise, Vert-le-Petit, France
- 10.00 *FE-2:IL08* **Resonant Light Trapping in Iron Oxide (Fe2O3) Ultrathin Film Photoanodes for Solar Powered Water Photoelectrolysis**
H. DOTAN, A. ROTHSCILD, Dept. of Materials Science and Engineering Technion - Israel Institute of Technology, Haifa, Israel
- 10.30 *FE-2:L10* **Photocatalytic Degradation Diesel of Soot: Unraveling the Reaction Mechanism**
M. SMITS, **S. LENAERTS**, Lab. for Sustainable Energy and Air Purification, Dept. of Bioscience-engineering, University of Antwerp, Antwerp, Belgium; YUN LING, S. VAN DOORSLAER, Dept. of Physics, University of Antwerp, Antwerp, Belgium
- 10.50 *Break*

Session FE-3 - Design Approaches for Advanced Applications

Chair: A.W. MORAWSKI, Poland

- 11.20 *FE-3:IL01* **Nanocrystal Self-assembly as a Route to Atomically Coherent 2-D Semiconductor Superlattices with Dirac-type Charge Carriers**
W.H. EVERS⁴, D. MITORAJ¹, M. DIJKSTRA¹, C. MORAIS-SMITH², C. DELERUE³, E. KALESKI³, **D. VANMAEKELBERGH¹**, ¹Debye Institute for Nanomaterials Science, University of Utrecht, The Netherlands; ²Institute for Theoretical Physics, Utrecht, The Netherlands; ³IEMN-ISEN and University of Lille, France; ⁴Kavli-Institute for Nanoscience, Delft University of Technology, The Netherlands
- 11.50 *FE-3:IL02* **Development of Plasmonic Photocatalysts for Environmental Application**
E. KOWALSKA, B. OHTANI, Catalysis Research Center, Hokkaido University, Sapporo, Japan; A. MARKOWSKA-SZCZUPAK, West Pomeranian University of Technology, Szczecin, Poland; L. ROSA, S. JUODKAZIS, Centre for Micro-Photonics, Swinburne University of Technology, Hawthorn, Australia
- 12.20 *FE-3:IL03* **Photocatalytic Air Treatment of VOCs and Bioaerosols in Real Indoor Air Conditions**
B. SANCHEZ¹, M.C. CANELA², S. SUÁREZ¹, C.R. NUNES², M. SÁNCHEZ, I. JANSSON¹, ¹CIEMAT-Photocatalytic Treatment of Pollutants in Air, Madrid, Spain; ²Environmental Chemistry Research Group - Universidade Estadual do Norte Fluminense, Brazil

Session FF-3 - Magnetocaloric and Multifunctional Magnetic Materials

Room: **TETTUCCIO (Hotel Tamerici)**

Chair: O. GUTFLEISCH, Germany

- 8.30 *FF-3:IL05* **Transition Metal Based Magneto Caloric Materials**
E. BRÜCK, H.D. NGUYEN, Z. OU, Y. YIBOLE, L. CARON, L. ZHANG, F. GUILLOU, N. VAN DIJK, Delft Univ. of Technology, Faculty of Applied Sciences, Fundamental Aspects of Materials and Energy, Delft, The Netherlands
- 9.00 *FF-3:IL06* **The Search for New Magnetocaloric Materials**
K.G. SANDEMAN, Department of Physics, Blackett Laboratory, Imperial College London, London, UK
- 9.30 *FF-3:L07* **The Magneto-structural Coupling in MnCoGe-based Compounds**
L. CARON, N.T. TRUNG, E. BRÜCK, Fundamental Aspects of Materials and Energy, TUDelft, Delft, The Netherlands
- 9.50 *FF-3:L08* **Detailed Study of New Magnetic Ordering in FeMnP0.75Si0.25**
V. HÖGLIN, Y. ANDERSSON, **M. SAHLBERG**, Department of Chemistry - Ångström, Uppsala University, Uppsala, Sweden; P. NORDBLAD, Department of Engineering Sciences, Uppsala University, Uppsala, Sweden; M. HUDL, ICT Materials Physics, KTH Royal Institute of Technology, Kista, Sweden; L. CARON, Fundamental Aspects of Materials and Energy, Faculty of Applied Sciences, TUDelft, Delft, The Netherlands; P. BERAN, Nuclear Physics Institute, Academy of Sciences of the Czech Republic, Rez, Czech Republic; M.H. SORBY, Physics Department, Institute for Energy Technology, Kjeller, Norway
- 10.10 *FF-3:L09* **Tuning the Phase Transition by Si Substitution in Mn_{1.25}Fe_{0.70}P_{1-x}Si_x Compounds**
XUEFEI MIAO¹, L. CARON¹, P. ROY², N.H. DUNG¹, L. ZHANG^{1,3}, W.A. KOCKELMANN⁴, R. SMITH⁴, R.A. DE GROOT², N.H. VAN DIJK¹, E. BRÜCK¹, ¹Department of Radiation Science & Technology, Delft University of Technology, The Netherlands; ²Department of Electronic Structure of Materials, Radboud University, The Netherlands; ³BASF Nederland B.V., The Netherlands; ⁴ISIS, Rutherford Appleton Laboratory, UK
- 10.30 *Break*

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Chair: C. FELSER, Germany

- 11.00 *FF-3:L10* **Reduction of the Energy Barrier in First Order Magnetocaloric Materials**
K. MORRISON, Physics Department, Loughborough University, Loughborough, Leicestershire, UK
- 11.20 *FF-3:L11* **Structural and Magnetic Properties of the Ternary Compounds $Mn_{3-x}Fe_xSn$ and $Mn_{2-x}Fe_xSn$ for x range 0 between 1.25**
M.R. FELEZ, UNIFESP, Sao José dos Campos, SP, Brazil; F. YOKAICHYIA, LNLS, Campinas, SP, Brazil; A.A. COELHO, UNICAMP, Campinas, SP, Brazil; S. GAMA, UNIFESP, Sao José dos Campos, SP, Brazil
- 11.40 *FF-3:L12* **Study of Structural and Magnetic Properties of Si-doped MnAs**
S. GAMA¹, M. RODRIGUES FELEZ¹, A. DE AGUIAR COELHO², ¹Universidade Federal de Sao Paulo - UNIFESP - Campus Diadema, Brazil; ²Universidade Estadual de Campinas - UNICAMP, Brazil
- 12.00 *FF-3:L13* **Characterization of Magnetocaloric Effect in the $MnFeP_{1-x}As_x$ Intermetallic Compounds ($x=0.40-0.65$)**
P. WLODARCZYK, L. HAWELEK, A. KOLANO-BURIAN, P. ZACKIEWICZ, M. KAMINSKA, Institute of Non-Ferrous Metals, Gliwice, Poland; A. CHROBAK, University of Silesia, Institute of Physics, Katowice, Poland
- 12.20 *FF-3:L14* **Hall Probe Imaging of Magnetocaloric $LaFe_{13-x}Si_x$**
E. LOVELL¹, A.M. PEREIRA¹, K. MORRISON², O. GUTFLEISCH³, **L.F. COHEN**¹, ¹The Blackett Laboratory, Imperial College, London, UK; ²Department of Physics, Loughborough University, Leicestershire, UK; ³Tech Univ Darmstadt, Dept Mat Science, Darmstadt, Germany
- 12.40 *FF-3:L15* **Magnetic Properties of Severe Plastic Deformed Gd, Nd and Sm Rare-earth Metals**
S.V. TASKAEV, V.D. BUCHELNIKOV, D.S. BATAEV, **M.N. ULYANOV**, Chelyabinsk State University, Chelyabinsk, Russia; V.V. KHOVAYLO, National University of Science and Technology "MISIS", Moscow, Russia; K.P. SKOKOV, TU Darmstadt, Darmstadt, Germany; A.P. PELLENEN, National Research South Ural State University, Chelyabinsk, Russia

Session FI-1 - Material Growth and Processing

Room: **ZENITH**

Chair: G. RIGHINI, Italy (*Programme Chair*)

8.30 *Welcome*

8.40 *FI-1:IL09* **Development of AlN-based Technology for Deep UV Light Sources**

Z. SITAR^{1,2}, B. MOODY¹, S. CRAFT¹, R. SCHLESSER¹, R. DALMAU¹, J. XIE¹, S. MITA¹, T. RICE², J. TWEEDY², J. LEBEAU², L. HUSSEY², R. COLLAZO², B. GADDY², D. IRVING², ¹HexaTech, Inc., Morrisville, North Carolina, USA; ²Dept. of Materials Science and Engineering, North Carolina State Univ., Raleigh, USA

9.10 *FI-1:IL01* **The Transition to Solid State Lighting: Trends and Challenges**

B. WESSLER, OSRAM GmbH, Munich, Germany

9.40 *FI-1:IL03* **Fabrication of Nitride Devices by Pulsed Sputtering Deposition**

H. FUJIOKA, Institute of Industrial Science, The University of Tokyo, Tokyo, Japan; CREST-JST, Chiyoda-ku, Tokyo, Japan

10.10 *FI-1:IL04* **Universal Bipolar Host Materials for Highly Efficient Electrophosphorescent Devices**

KEN-TSUNG WONG, Department of Chemistry, National Taiwan University, Taipei, Taiwan

10.40 *Break*

Chair: H. FUJIOKA, Japan

11.10 *FI-1:IL05* **Semipolar GaN-based Optoelectronic Structures on Large Area Substrates**

F. SCHOLZ, T. MEISCH, M. CALIEBE, Institute of Optoelectronics, University of Ulm, Ulm, Germany; B. NEUSCHL, K. THONKE, Institute of Quantum Matter, University of Ulm, Ulm, Germany

11.40 *FI-1:IL06* **AlGaN Growth for Electron-Beam-Excitation Ultra-violet Light Source**

H. MIYAKE¹, F. FUKUYO^{1,2}, K. HIRAMATSU¹, Y. KOBAYASHI², ¹Department of Electrical and Electronic Engineering, Mie University, Japan; ²Hamamatsu Photonics K.K., Japan

12.10 *FI-1:IL07* **Novel Blue Fluorescent Organic Emitters Based on Dual Core Chromophores for Highly Efficient OLED Device**

JONGWOOK PARK, Department of Chemistry, Catholic University of Korea, Yockog, Bucheon, Kyunggi, Korea

Session FJ-5 - Nuclear Fuel Materials

Room: **GUTTUSO (Hotel Croce di Malta)**

Chair: T. WISS, Germany

- 9.00 *FJ-5:IL04* **Status of the Low Enriched Uranium Fuel Development for High Performance Research Reactors**
L. SANNEN, S. VAN DEN BERGHE, SCK.CEN, Mol, Belgium
- 9.30 *FJ-5:IL05* **Fabrication of Nuclear Fuel Beads by a Microfluidic Sol-gel Process**
ZHEN-QI CHANG, X. LI, Y.T. YANG, M. ZHANG, Q.Y. HUANG, L.S. SHENG, SNST and INEST of USTC, HeFei, AnHui, P.R. China; C. SERRA, ICPEES - UMR 7515 CNRS and ECPM of UdS, Strasbourg, France
- 10.00 *FJ-5:L06* **Modelling and Simulation of Nuclear Fuel Rods with the BaCo Code**
A.C. MARINO, División SiM³, Gerencia Ciclo del Combustible Nuclear (GCCN), Comisión Nacional de Energía Atómica (CNEA), Centro Atómico Bariloche (CAB), Bariloche, Argentina
- 10.20 *FJ-5:L07* **Low-temperature Deposition of SiC Coatings in TRISO Particle Fuel and Evaluation of Properties**
WEON-JU KIM, D. KIM, J.Y. PARK, Y.-K. KIM, M.S. CHO, Korea Atomic Energy Research Institute, Daejeon, Korea
- 10.40 *FJ-5:L08* **A Diffusion Model for UF₄ Reaction with Yttria at 1740 K**
Z.E. ERKMEN, Marmara Univ. Dept. of Metallurgy & Materials Eng., Göztepe Campus, Istanbul, Turkey
- 11.00 *Break*

Session FJ-6 - Radiation Effects

Chair: I. SZLUFARSKA, USA

- 11.30 *FJ-6:IL01* **Modeling of Neutron Irradiation Embrittlement of Highly Irradiated Reactor Pressure Vessel Steels in Japan**
N. SONEDA, K. NAKASHIMA, K. NISHIDA, A. NOMOTO, K. DOHI, CRIEPI, Yokosuka, Kanagawa, Japan
- 12.00 *FJ-6:IL02* **Irradiation Effects on RAFM Steel**
E. GAGANIDZE, C. DETHLOFF, J. AKTAA, Karlsruhe Institute of Technology, Institute for Applied Materials, Eggenstein-Leopoldshafen, Germany
- 12.30 *FJ-6:L04* **Effects of Solute Elements on Hardening of Thermally-aged RPV Model Alloys**
K. NISHIDA, K. DOHI, A. NOMOTO, N. SONEDA, CRIEPI, Komae, Tokyo, Japan; L. LIU, N. SEKIMURA, Bunkyo-ku, Tokyo, Japan; Z. LI, Beijing, China

Session FK-3 - Properties

Room: **URANO**

Chair: **C. CASIRAGHI, UK**

9.00 FK-3:IL01 Structure, Properties, and Applications of Nanodiamonds

V.N. MOCHALIN, I. NEITZEL, A. PENTECOST, Y. GOGOTSI, Department of Materials Science & Engineering, Drexel University, Philadelphia, PA, USA

9.30 FK-3:IL07 Thermionic and Photon-enhanced Emission from CVD Diamond: Influence of Nanostructure, Doping, and Substrate

R.J. NEMANICH, M.D. BROWN, G. HEMBREE, F.A.M. KOECK, TIANYIN SUN, Department of Physics, Arizona State University, Tempe, AZ, USA

10.00 FK-3:IL08 Plasma Hydrogenation of Nanodiamonds: Fundamentals and Surface Properties

J.C. ARNAULT, T. PETIT, H.A. GIRARD, C. GESSET, A. TROUVÉ, P. BERGONZO, CEA, LIST, Diamond Sensors Laboratory, Gif sur Yvette, France

10.30 Break

Chair: **J.C. ARNAULT, France**

11.00 FK-3:IL09 Chemically Modified Graphene Heterostructures

M.C. HERSAM, Northwestern University, Evanston, IL, USA

11.30 FK-3:IL10 Raman Fingerprint of Aligned h-BN/Graphene Superlattices

C. CASIRAGHI, School of Chemistry, University of Manchester, Manchester, UK

12.00 FK-3:IL11 The Uniqueness of Physical and Chemical Natures of Graphene: their Coherence and Conflicts

E.F. SHEKA, Peoples' Friendship University of Russia, Moscow, Russia

12.30 FK-3:IL12 Ultrafast Dynamics in Graphene

TING YU, Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore; Department of Physics, Faculty of Science, National University of Singapore, Singapore; Graphene Research Center, National University of Singapore, Singapore

Session FL-2 - Role of Transport in Materials Development, Properties and Behaviour

Room: **BARZAGLI (Hotel Croce di Malta)**

Chair: I.V. BELOVA, Australia

- 9.00 *FL-2:IL01* **Grain Boundary Growth in Evolving Microstructure**
A. ZIGELMAN, **A. NOVICK-COHEN**, Department of Mathematics, Technion-IIT, Haifa, Israel; A. VILENKIN, The Rachah Institute of Physics, The Hebrew University of Jerusalem, Jerusalem, Israel
- 9.30 *FL-2:IL02* **Effects of Strain, Orientation, and Microstructure on Oxygen Reduction in SOFC Cathode Materials**
M. YAN, J. INFANTE, P.H. LEE, L. YAN, R. CHAO, K.R. BALASUBRAMANIAM, **P. A. SALVADOR**, Department of Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, USA
- 10.00 *FL-2:IL03* **Wetting Phase Transition in Grain Boundaries**
B.B. STRAUMAL^{1,2}, B. BARETZKY², ¹Institute of Solid State Physics Russian Academy of Sciences, Chernogolovka, Russia; ²Karlsruher Institut für Technologie (KIT), Institut für Nanotechnologie, Eggenstein-Leopoldshafen, Germany

Session FM-1 - Resistance Switching Memories (ReRAM)

Room: **ALBA 2**

Chair: S. SPIGA, Italy

8.30 FM-1:IL05 A Review of Three-dimensional Resistive Switching Cross-Bar Array Memories from the Integration and Materials Property Points of View

JUN YEONG SEOK^{1, 2}, SEUL JI SONG¹, JUNG HO YOON¹, KYUNG JEAN YOON¹, TAE HYUNG PARK¹, DAE EUN KWON¹, HYUNGKWANG LIM^{1, 2}, GUN HWAN KIM¹, DOO SEOK JEONG², **CHEOL SEONG HWANG¹**, ¹Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, Seoul, South Korea; ²Electronic Materials Research Center, Korea Institute of Science and Technology, Seoul, South Korea

9.00 FM-1:IL06 Low-power Operation and Reliability of Oxide-based RRAM

D. IELMINI, DEIB, Politecnico di Milano, Milano, Italy

9.30 FM-1:IL07 On the Origin of Failure Mechanism of Endurance and Retention of HfO₂ based ECM Cells

HANGBING LV, XIAOXIN XU, RUOYU LIU, HONGTAO LIU, QI LIU, SHIBING LONG, **MING LIU**, Laboratory of Nano-Fabrication and Novel Devices Integrated Technology, Institute of Microelectronics, Chinese Academy of Sciences, Beijing, China

10.00 Break

Session FM-3 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

Room: **ALBA 2**

Chair: B. NOHEDA, The Netherlands / A. GRUVERMAN, USA

- 10.30 *FM-3:IL05* **Ultimate Scalability of MRAMs and Logic Functionalities**
I.L. PREJBEANU¹, R.C. SOUSA¹, B. DIENY¹, J.-P. NOZIERES¹, S. BANDIERA², L. LOMBARD², Q. STAINER², K. MACKAY², ¹SPINTEC, UMR8191 CEA/DSM/INAC-CNRS-UJF, Grenoble, France; ²Crocus Technology, Grenoble, France
- 11.00 *FM-3:IL06* **Doped Hafnium Oxide - An Enabler for Ferroelectric Field Effect Transistors**
T. MIKOLAJICK^{1,2}, U. SCHROEDER¹, J. MÜLLER³, S. MÜLLER¹, T. SCHENK¹, E. YURCHUK¹, S. SLESAZECK¹, ¹NaMLab GmbH, Dresden, Germany; ²Institut für Halbleiter und Mikrosystemtechnik, TU Dresden, Dresden, Germany; ³Fraunhofer Center Nanoelectronic Technologies, Dresden, Germany
- 11.30 *FM-3:L07* **Integration of STT-MRAM for Embedded Cache Memory**
T. SUGII, Y. IBA, M. AOKI, H. NOSHIRO, K. TSUNODA, A. HATADA, M. NAKABAYASHI, Y. YAMAZAKI, A. TAKAHASHI, C. YOSHIDA, Low-power Electronics Association & Project (LEAP), Tsukuba, Ibaraki, Japan
- 11.50 *FM-3:L08* **Study of Magnetoelectric Effects in Composite FM/FE Heterostructures by Mossbauer Spectroscopy**
V. IVANOV, **A. ZENKEVICH**, National Research Center "Kurchatov Institute", Moscow, Russia; R. MANTOVAN, Laboratorio MDM IMM-CNR, Agrate Brianza, Italy; M. FANCIULLI, Università degli Studi Milano - Bicocca & Laboratorio MDM IMM-CNR, Agrate Brianza, Italy; K. MAKSIMOVA, Baltic Federal University, Kaliningrad, Russia
- 12.10 *FM-3:L09* **Integration of Ferromagnetic and Ferroelectric Oxides on Semiconductors**
A.A. DEMKOV¹, A.B. POSADAS¹, P. PONATH, M. CHOI, H. SEO, K. FREDRICKSON, R. HATCH, D.J. SMITH², M.R. MCCARTENTY², ¹Department of Physics, The University of Texas, Austin, TX, USA; ²Department of Physics, Arizona State University, Tempe, AZ, USA

Session FN-3 - Properties of Semiconductors (of Any Types)

Room: **TORRETTA (Hotel Tamerici)**

Chair: A. FUJIMORI, Japan

- 8.30 *FN-3:IL06* **STM Spectroscopy Probe of Magnetic Field Depairing and Vortex Lattice Transition in a Multiband Superconductor**
I. FRIDMAN¹, V. LUKIC², C. KLOC³, C. PETROVIC⁴, **J.Y.T. WEI**^{1, 5},
¹University of Toronto, Canada; ²Stevens Institute of Technology, USA; ³Nanyang Technological University, Singapore; ⁴Brookhaven National Lab., USA; ⁵Canadian Inst. for Advanced Research, Canada
- 9.00 *FN-3:IL07* **High T_c Superconductivity in Cuprate/Titanate Heterostructures**
D. DI CASTRO, G. BALESTRINO, A. TEBANO, D. INNOCENTI, F. RIDOLFI, University of Rome Tor Vergata and CNR-SPIN, Rome, Italy; C. ARUTA, CNR-SPIN, Rome, Italy
- 9.30 *FN-3:L08* **Role of Mg-B-O Nanostructural Inhomogeneities on the Performance of Superconducting MgB₂**
T.A. PRIKHNA¹, M. EISTERER², V.V. KOVYLAEV³, H.W. WEBER², V. MOSHCHIL¹, W. GAWALEK⁴, X. CHAUD⁵, ¹Inst. for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine; ²Atominstitut, Vienna University of Technology, Vienna, Austria; ³Inst. for Problems in Material Science of the National Academy of Sciences of Ukraine, Kiev, Ukraine; ⁴Inst. für Photonische Technologien, Jena, Germany; ⁵CNRS/LNMP, Grenoble Cedex, France
- 9.50 *FN-3:L09* **Microwave Measurements of Surface Resistance and Conductivity of Optimised NdBaCuO Films**
J. MAZIERSKA, K. LEONG, James Cook University, Townsville, Australia; J. KRUPKA, Warsaw University of Technology, Poland
- 10.10 *Break*

Session FN-4 - Theory and Mechanisms (for Normal and Superconducting States)

Chair: J. LORENZANA, Italy

- 10.40 *FN-4:IL03* **Recent Progress in Modeling Electronic Structure and Spectroscopy of Novel Superconductors and Topological Insulators**
A. BANSIL, Physics Dept., Northeastern University, Boston, MA, USA
- 11.10 *FN-4:IL04* **Sorting Chicken from Eggs: Polaronic or Spin Fluctuation Mediated Superconductivity in High Temperature Copper Oxides**
A. BUSSMANN-HOLDER, Max-Planck-Institute for Solid State Research, Stuttgart, Germany
- 11.40 *FN-4:IL05* **Density Functional Theory for Plasmon-assisted Superconductivity**
R. AKASHI, **R. ARITA**, RIKEN Center for Emergent Matter Science (CEMS), Saitama, Japan
- 12.10 *FN-4:IL06* **Magnetic and Ionic Effects in High-temperature Superconductors**
G. NIKSIC, **D.K. SUNKO**, S. BARISIC, Dept. of Physics, Faculty of Science, University of Zagreb, Zagreb, Croatia

Session FO-3 - Medical Diagnostics and Imaging

Room: **SIRIO**

Chair: **R.J. NARAYAN, USA**

- 9.00 *FO-3:IL01* **Infrared Sensors Inspired by Pyrophilous Insects**
H. BOUSACK, Forschungszentrum Jülich, Jülich, Germany; **H. SCHMITZ**, Universität Bonn, Bonn, Germany; **M. SCHOSSIG**, Technische Universität Dresden, Dresden, Germany
- 9.30 *FO-3:IL02* **Novel Nanostructured Sensors for Orthopaedics**
S. SIRIVISOOT, Biological Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi, Bangkok, Thailand
- 10.00 *FO-3:L05* **Synthesis and Magnetic Properties of $Zn_xFe_{3-x}O_4$ Nanoparticles for MRI Contrast Agents**
V.V. PANKOV, **D.A. KOTIKOV**, **E.G. PETROVA**, Belarusian State University, Minsk, Belarus
- 10.20 *FO-3:L06* **Analytical and Theranostic Applications of Plasmonic Nanoparticles and Nanocomposites**
N.G. KHEBTSOV, **V.A. BOGATYREV**, **L.A. DYKMAN**, **B.N. KHEBTSOV**, **E.V. PANFILOVA**, **T.E. PYLAEV**, **V.A. KHANADEEV**, Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences and Saratov State University, Saratov, Russia; **G.S. TERYTYK**, **V.V. TUCHIN**, Saratov State University, Saratov, Russia
- 10.40 *Break*

Session FO-5 - Targeted Delivery, Controlled Release Systems and Nanotheranostics

Chair: **H. ULUDAG, Canada**

- 11.10 *FO-5:IL02* **Programmable, Targeted Drug Delivery for Musculoskeletal Regenerative Engineering**
TAO JIANG, **W.H. LO**, **C.T. LAURENCIN**, Institute for Regenerative Engineering, University of Connecticut Health Center, Farmington, CT, USA
- 11.40 *FO-5:L03* **Development of Novel Mesoporous Silica-based Bioactive Glass Scaffolds with Drug Delivery Capabilities**
A. PHILIPPART, **A.R. BOCCACCINI**, Institute of Biomaterials, University of Erlangen-Nuremberg, Erlangen, Germany
- 12.00 *FO-5:L05* **New Family of Bioactive Glass Based Scaffolds with Drug Delivery Capability for Bone Regeneration**
E. BOCCARDI, **A. PHILIPPART**, **A.R. BOCCACCINI**, Institute of Biomaterials (WW7), Erlangen, Bayern, Germany
- 12.20 *FO-5:L07* **Engineered Nanotubular Structures for Multifunctional Medical Implants**
T. SHOKUH FAR, Dept. of Mechanical Engineering, Michigan Technological University, Houghton, MI, USA; Dept. of Restorative Dentistry, College of Dentistry, University of Illinois at Chicago, Chicago, IL, USA

Session FO-8.2 - Light-sensitive Polymers for Biomedical Applications

Room: **ORSA MAGGIORE**

Chair: RYO YOSHIDA, Japan

- 8.30 *FO-8.2:IL01* **Synthesis, Functionalization and Biological Applications of Porous Polymer Surfaces**
P. LEVKIN, Karlsruhe Institute of Technology, Institute of Toxicology and Genetics Heidelberg University, Applied Physical Chemistry, Eggenstein-Leopoldshafen, Germany
- 9.00 *FO-8.2:IL02* **Dynamic Cell Microenvironments**
A. DEL CAMPO, Max-Planck-Institut für Polymerforschung, Mainz, Germany
- 9.30 *FO-8.2:L03* **Reversible Photochromic Polynorbornenes Bearing Spiropyran Side Groups for Layer-by-layer Coatings**
L. FLOREA¹, C. MOLONEY¹, D. NIXON¹, S. MOULTON², G.W. WALLACE², F. BENITO-LOPEZ^{1,3}, D. DIAMOND¹, ¹INSIGHT, National Centre for Sensor Research, Dublin City University, Dublin, Ireland; ²ARC Centre of Excellence for Electromaterials Science and Intelligent Polymer Research Institute, University of Wollongong; ³CIC microGUNE, Arrasate-Mondragón, Spain
- 9.50 *FO-8.2:L04* **Light-driven Polymer Nanowire for Cell Manipulation**
J. LEE¹, S. OH², J. PYO¹, J. KIM², **JUNG HO JE**¹, ¹X-ray Imaging Center, Department of Materials Science and Engineering, Pohang University of Science & Technology, Pohang, Korea; ²Institute of Nanoscience and Technology, Department of Chemical Engineering, Hanyang University, Seoul, Korea
- 10.10 *FO-8.2:L05* **Chemo-responsive Polymer Networks Containing Coordination Crosslinks and Covalent Netpoints**
P. ZHANG^{1,2,3}, M. BEHL^{1,3}, A. LENDLEIN^{1,2,3}, ¹Institute of Biomaterial Science and Berlin-Brandenburg Center for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany; ²Institute of Chemistry, University of Potsdam, Potsdam, Germany; ³Tianjin University-HZG Research Center Joint Laboratory for Biomaterials and Regenerative Medicine, Tianjin, China, and Teltow, Germany
- 10.30 *Break*

Session FO-8.3 - Smart Composites for Biomedical Applications

Room: ORSA MAGGIORE

Chair: F.R. WURM, Germany

- 11.00 *FO-8.3:IL01* **Polyurethane Based Shape-memory Polymers**
WEI MIN HUANG, Nanyang Technological University, Singapore
- 11.30 *FO-8.3:L03* **Gold@pNIPAM Nanoparticles as Surface-enhanced Resonance Raman Spectroscopy (SERRS) Tags for Cell Differentiation**
G. BODELÓN, V. MONTES-GARCÍA, C. FERNÁNDEZ-LÓPEZ, I. PASTORIZA-SANTOS, L.M. LIZ-MARZÁN, **J. PÉREZ-JUSTE**, University of Vigo, Dept. of Physical Chemistry, Vigo, Spain
- 11.50 *FO-8.3:L04* **Glycopolymer Coated Gold Nanoparticle via RAFT Polymerization for Biosensing**
Y. MIURA, Kyushu University, Fukuoka, Japan
- 12.10 *FO-8.3:L05* **Thermally-induced Reversible Shape-Memory Effect of Hybrid Nanocomposites Under Constant Stress**
M.Y. RAZZAQ, M. BEHL, A. LENDLEIN, Institute of Biomaterial Science, Helmholtz-Zentrum Geesthacht, Teltow, Germany

Session FO-8.4 - Biomedical Applications Based on Degradable, Stimuli-responsive Polymers

- 12.30 *FO-8.4:IL02* **Aliphatic Poly(carbonate)s as Versatile Materials for Tissue Engineering**
I.A. BARKER¹, V.X. TRUONG¹, S. TEMPELAAR¹, L. MESPOUILLE², M. TAN², P. DUBOIS², **A.P. DOVE**¹, ¹Department of Chemistry, University of Warwick, Coventry, UK; ²Materials Research Institute, Center of Innovation and Research in Materials and Polymers (CIRMAP), Laboratory of Polymeric and Composite Materials, University of Mons, Mons, Belgium

Session FO-9.1/2 - Sensor Technology and Smart Fabrics and Wearables

Room: **BUENO (Hotel Croce di Malta)**

Chair: D. DE ROSSI, Italy (*Programme Chair*)

9.20 *Welcome*

9.30 *FO-9.1:IL02* **A Wearable Computer Platform “Wewear” for Healthcare Monitoring**
G.K. STYLIOU, L. LUO, RIFLEX, Heriot Watt University, Galashiels, UK

10.00 *FO-9.2:IL02* **Electronic Textile Platforms for Monitoring in Physiological Parameter**
R. PARADISO, Smartex srl, Cascina (PI), Italy

10.30 *FO-9.2:IL03* **On-Body Chem/Bio-Sensing - Opportunities and Challenges**
D. DIAMOND, INSIGHT, National Centre for Sensor Research, Dublin City University, Dublin, Ireland

11.00 *Break*

11.30 *FO-9.2:IL04* **Stretchable Circuits with Horseshoe Shaped Conductors Embedded in Elastic and Thermoplastic Polymers**
J. VANFLETEREN, F. BOSSUYT, T. VERVUST, M. JABLONSKI, B. VAN KEYMEULEN, I. CHTIOUI, B. PLOVIE, R. VERPLANCKE, A. JAHANSHAH, J. DE BAETS, CMST, Ghent University and imec, Ghent, Belgium

12.00 *FO-9.2:L05* **Programmable ‘Soft’ Machines and Future Ways of Living**
D.K. ARVIND, School of Informatics, University of Edinburgh, UK;
R. OLIVER, Chair Active & Interactive Materials, Northumbria University, UK

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

Room: **AUDITORIUM**

Chair: M. WATANABE, Japan

- 15.00 *FA-2:IL19* **Kinetics of the Hydrogen Oxidation in Alkaline and Acid Environment**
H.A. GASTEIGER, H. BEYER, C. DENK, J. DURST, H. EL-SAYED, T. GEPPERT, T. GREESE, F. HASCHE, J. HERRANZ, P. MADKIKAR, M. PIANA, P. RHEINLÄNDER, A. SIEBEL, X. WANG, Technical Electrochemistry, Chemistry Department, Technische Universität München, Garching, Germany
- 15.30 *FA-2:IL20* **Nitrogen-doped Carbon Materials as Catalysts Supports for the Electro-oxidation of Metanol**
M.J. LAZARO, M.J. NIETO, D. SEBASTIÁN, C. ALEGRE, M.E. GÁLVEZ, I. SUELVEZ, R. MOLINER, Instituto de Carboquímica, CSIC, Zaragoza, Spain
- 16.00 *FA-2:L22* **Non-noble Metal Catalysts for Fuel Cell Applications**
E.E. WESTSSON, G.J.M KOPER, Technical University of Delft, Delft, The Netherlands
- 16.20 *Break*

Chair: M.J. LAZARO, Spain

- 16.50 *FA-2:IL03* **Catalysts and Durability Issues of Polymer Electrolyte Fuel Cells**
T.J. SCHMIDT, Electrochemistry Laboratory, Paul Scherrer Institut, Villigen PSI, Switzerland
- 17.20 *FA-2:IL24* **Pt-Ru Electrocatalysts for CO and Methanol Oxidation Supported on Carbon Nanofibers: Influence of Synthesis Methods on Activity**
J.C. CALDERÓN¹, L. CALVILLO², M.J. LÁZARO², G. GARCÍA¹, J.L. RODRÍGUEZ¹, **E. PASTOR**¹, ¹Dpto. Química Física, Instituto Universitario de Materiales y Nanotecnología, Universidad de La Laguna, La Laguna, Tenerife, Spain; ²Instituto de Carboquímica (CSIC), Zaragoza, Spain
- 17.50 *FA-2:L25* **Combination of Stochastic and Numeric Modeling of Fibrous Microstructures of HT-PEFC Gas Diffusion Layers**
D. FRONING¹, J.P. BRINKMANN¹, G. GAISELMANN², U. REIMER¹, V. SCHMIDT², W. LEHNERT¹, ¹Forschungszentrum Jülich GmbH, Jülich, Germany; ²Ulm University, Germany

Room: **LE PLEIADI**

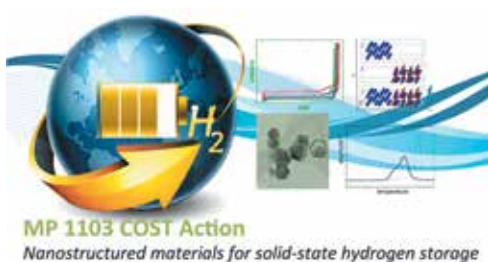
Symposium FB
Hydrogen Production and Storage

COST Action MP 1103

Working Groups Meeting:

WG1-2-3-4

15.00 - 19.00



Session FE-1 - Tailored Synthesis of Nanostructured Materials for Photofunctional Properties

Room: ORSA MINORE

Chair: E. GIAMELLO, Italy

- 15.00 *FE-1:L14* **Solar Light Water Splitting at Nanostructured Metal Oxide Photoelectrodes**
J. AUGUSTYNSKI, R. SOLARSKA, University of Warsaw, Center of New Technologies, Warsaw, Poland
- 15.20 *FE-1:L15* **Development of High Surface Area Titania on Glass Fibre Supports for Photocatalysis**
P. YILMAZ, A.M. LACERDA, I. LARROSA, S. DUNN, School of Engineering and Materials Science, Queen Mary University of London, London, UK
- 15.40 *FE-1:L16* **Low Temperature Deposition of Photocatalytic TiO₂ Coatings by Ink-jet Printing**
P. LOMMENS, J. WATTÉ, I. VAN DRIESSCHE, SCRiPTs, Department of Inorganic and Physical Chemistry, Ghent University, Ghent, Belgium
- 16.00 *FE-1:L17* **Highly Efficient Metal Supported Photocatalyst due to the Excitation of Localised Surface Plasmon Resonance**
A.M. LACERDA, I. LARROSA, S. DUNN, Queen Mary, University of London, London, UK
- 16.20 *FE-1:L18* **Photocatalytic Reduction of CO₂ into Solar Fuel Using Oxide-based Catalysts**
TAO HE, National Center for Nanoscience and Technology, Beijing, China
- 16.40 *Break*

Chair: D. VANMAEKELBERGH, The Netherlands

- 17.10 *FE-1:L20* **Tuning the Visible Light Activity of Plasmonic Photocatalysts to the Solar Spectrum**
S.W. VERBRUGGEN, M. KEULEMANS, S. LENAERTS, University of Antwerp, Antwerp, Belgium; J.A. MARTENS, KU Leuven, Heverlee, Belgium
- 17.30 *FE-1:L22* **Preparation, Characterization and Photocatalytic Properties of Periodically Organized Mesoporous Titania Thin Film: Influence of Doping for Visible Light Activity**
S. SEMLALI^{1,2}, **T. PIGOT**¹, S. LACOMBE¹, D. FLAHAUT¹, L. NICOLE², ¹IPREM-UMR CNRS 5254, Pau, France; ²LCMCP, UMR CNRS 7574, College de France, France
- 17.50 *FE-1:L23* **New UV and Visible Photocatalysts Prepared by a Microwave Assisted Approaches: from Better Knowledge to Better Efficiency**
O. DURUPTHY, F. DUFOUR, M.-A. LAVERGNE, S. PIGEOT-REMY, S. CASSAIGNON, C. CHANÉAC, LCMCP-UPMC, Paris, France; C. COLBEAU-JUSTIN, LCP-UPSud, France

Session FF-3 - Magnetocaloric and Multifunctional Magnetic Materials

Room: **TETTUCCIO (Hotel Tamerici)**

Chair: L. MANOSA, Spain

- 15.00 *FF-3:L16* **On the Magnetic Fluctuations in the Magnetocaloric-effect in Rare-earth Intermetallic Compounds**
P. ALVAREZ-ALONSO¹, P. GORRIA², **J.A. BLANCO**², ¹Departamento de Electricidad y Electrónica, UPV/EHU, Leioa, Spain; ²Departamento de Física, Universidad de Oviedo, Oviedo, Spain
- 15.20 *FF-3:L17* **Enhanced Refrigeration Capacity in RNi₂ Polycrystalline Ribbons Fabricated by Melt Spinning**
P. GORRIA¹, J.L. SÁNCHEZ LLAMAZARES², P.J. IBARRA-GAYTAN², C.F. SÁNCHEZ-VALDÉS², P. ALVAREZ-ALONSO³, J.A. BLANCO⁴, ¹Departamento de Física, EPI, Universidad de Oviedo, Gijón, Spain; ²División de Materiales Avanzados, IPICYT, San Luis Potosí, Mexico; ³Departamento de Electricidad y Electrónica, Universidad del País Vasco, Bilbao, Spain; ⁴Departamento de Física, Facultad de Ciencias, Universidad de Oviedo, Oviedo, Spain
- 15.40 *FF-3:L18* **Magnetocaloric Properties of Gd or Nd Substituted La-Ba Manganites**
G. TONOZLIS, **G. LITSARDAKIS**, Aristotle University, Thessaloniki, Greece
- 16.00 *FF-3:L19* **Direct Adiabatic Temperature Change Measurements in a Series of Modified Gd₅Si₂Ge₂ Alloys**
P. PODMILJSAK^{1, 2}, P.J. MCGUINNESS^{1, 2}, K. SKOKOV³, O. GUT-FLEISCH³, S. KOBE¹, ¹Department for Nanostructured Materials, Jozef Stefan Institute, Ljubljana, Slovenia; ²Center of Excellence NAMASTE, Ljubljana, Ljubljana, Slovenia; ³TU Darmstadt, Darmstadt, Germany
- 16.20 *FF-3:IL20* **Tetragonal Heusler Compounds for Spintronics**
C. FELSER, A.K. NAYAK, O. MESHCHERIAKOVA, V. ALIJANI, J. WINTERLIK, G. FECHER, S. OUARDI, S. CHADOV, Max Planck Institute of Chemical Physics for Solids, Dresden, and Johannes Gutenberg University, Mainz, Germany
- 16.50 *Break*

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Continued from preceding page

Chair: N.M. DEMPSEY, France

- 17.20 *FF-3:IL21* **Strain-mediated Magnetocaloric and Magnetoelectric Effects in Oxide Heterostructures**
X. MOYA, C. DUCATI, L.C. PHILLIPS, W. YAN, M. GHIDINI, M.E. VICKERS, N. D. MATHUR, Department of Materials Science, University of Cambridge, Cambridge, UK; L.E. HUESO, O. HOVORKA, A. BERGER, CIC nanoGUNE Consolider, Donostia, San Sebastian, Spain; F. MACCHEROZZI, S.S. DHESI, Diamond Light Source, Chilton, Didcot, Oxfordshire, UK; A.I. TOVSTOLYTKIN, D.I. PODYALOVSKII, Institute of Magnetism, Kyiv, Ukraine; E. DEFAY, CEA- LETI, Minatec Campus, Grenoble, France
- 17.50 *FF-3:L22* **Epitaxial Thin Films and Submicron-sized Patterning of Ni-Mn-Ga**
P. RANZIERI, S. FABBRICI, L. NASI, F. CASOLI, V. CHIESI, M. CAMPANINI, F. ALBERTINI, IMEM-CNR, Parma, Italy; L. RIGHI, Chemistry Department, Parma University, Parma, Italy; E. VILLA, CNR-IENI, Lecco, Italy; F. CELEGATO, G. BARRERA, P. TIBERTO, INRIM, Torino, Italy
- 18.10 *FF-3:L23* **Rapidly Quenched Ferromagnetic Shape Memory Ni-Mn-Ga Wires**
C. GOMEZ-POLO, J.I. PÉREZ-LANDEZÁBAL, V. RECARTE, V. SÁNCHEZ-ALARCOS, Dpto. Física, Universidad Pública de Navarra, Campus de Arrosadía, Pamplona, Spain; G. BADINI, M. VÁZQUEZ, Instituto de Ciencia de Materiales, CSIC, Madrid, Spain
- 18.30 *FF-3:L24* **Atomic Layer- and Chemical Vapor- deposition of Multiferroic Er-Fe-O Thin Films**
S. VANGELISTA, R. MANTOVAN, C. WIEMER, **A. LAMPERTI**, G. TALLARIDA, Laboratorio MDM IMM-CNR, Agrate Brianza (MB), Italy; E. CHIKOIDZE, Y. DUMONT, GEMaC, CNRS-Université de Versailles St. Quentin en Yvelines, Versailles Cedex, France; M. FANCIULLI, Laboratorio MDM IMM-CNR, Agrate Brianza (MB), Italy and Dipartimento di Scienza dei Materiali, Università di Milano Bicocca, Milano, Italy

Session FG-3 - Emerging Technologies and New Concepts

Room: **ZENITH**

Chair: N. STINGELIN, UK

- 15.00 *FG-3:IL14* **Organic and Organometallic Molecules for DSSC**
C. BAROLO, N. BARBERO, G. VISCARDI, Dip. Chimica, NIS Centre of Excellence, Università di Torino, Torino, Italy; JH YUM, MD.K. NAZEERUDDIN, M. GRAETZEL, Lab. de Photonique et Interfaces, Institut des Sciences et Ingénierie Chimiques, EPFL, Lausanne, Switzerland; F. SAUVAGE, Lab. de Réactivité et Chimie des Solides, Université de Picardie Jules Verne, CNRS UMR 7314, Amiens, France; V. GIANOTTI, M. MILANESIO, Dip. Scienze e Innovazione Tecnologica, Università del Piemonte Orientale "A. Avogadro", Alessandria, Italy; S. FANTACCI, F. DE ANGELIS, Istituto CNR di Scienze e Tecnologie Molecolari (ISTM), c/o Dip. Chimica, Università di Perugia, Perugia, Italy
- 15.30 *FG-3:IL17* **Synthesis of Rod-coil Diblock Copolymer with Different Approaches and its Use for the Passivation of CdSe Nanocrystals**
S. ZAPPIA, S. DESTRI, ISMAC-CNR, Milano, Italy; M. STRICCOLI, M.L. CURRI, A.E. DI MAURO, CNR-IPCF, c/o Università di Bari - Dip. di Chimica, Bari, Italy; A. RIZZO, R. MASTRIA, CNR-Nano-NNL, Lecce, Italy
- 15.50 *Break*

Special Session FG-4 - Building Integrated Photovoltaics

Chair: G. FARINOLA, Italy

- 16.20 *FG-4:IL01* **Novel Applications of High-concentration Photovoltaics**
K. BARNHAM, Physics Dept., Imperial College London, London, UK
- 16.50 *FG-4:IL02* **Photonic Light Trapping in Thin-Film Solar Cells and in Luminescent Solar Concentrators**
L.C. ANDREANI¹, A. BOZZOLA¹, S. FLORES DAORTA¹, P. KOWALCZEWSKI¹, M. LISCIDINI¹, R. FUSCO², D. TESTA², ¹Dipartimento di Fisica, Università degli Studi di Pavia, Pavia, Italy; ²ENI S.p.A, Research Center for Non-Conventional Energies - Istituto ENI Donegani, Novara, Italy
- 17.20 *FG-4:IL03* **Engineering Large Area Polymer and Hybrid Solar Cells**
T.M. BROWN, F. DI GIACOMO, G. MINCUZZI, F. DE ROSSI, V. ZARDETTO, L. VESCE, A. GUIDOBALDI, F. GIORDANO, F. MATTEOCCI, S. RAZZA, S. CASALUCI, L. LA NOTTE, D. MINEO, G. SUSANNA, L. SALAMANDRA, G. POLINO, G. SOSCIA, G. DE ANGELIS, E. PETROLATI, R. RICCITELLI, C. CORNARO, A. REALE, F. BRUNETTI, A. DI CARLO, Centre for Hybrid and Organic Solar Energy (CHOSE), University of Rome-Tor Vergata, Italy, and Dyepower Consortium, Roma, Italy
- 17.50 *FG-4:IL04* **Industrialization of Third Generation Photovoltaics**
F. MATTEUCCI, R. GIANNANTONIO, DHITECH, Lecce, Italy; M. MANCA, IIT, Istituto Italiano di Tecnologia, Arnesano, (Le), Italy; G. GIGLI, NNL - National Nanotechnology Laboratory, CNR Istituto Nanoscienze, Distretto Tecnologico, Lecce, Italy

Session FH-2 - Material Design and Characterization

Room: **VENERE**

Chair: T. KOIDA, Japan

- 15.00 *FH-2:IL15* **Rational Design of p-type TCOs**
D.O. SCANLON, University College London, Kathleen Lonsdale Materials Chemistry, Department of Chemistry, London, UK
- 15.30 *FH-2:IL16* **Site Occupancy in TCOs and the Relationship to Functional Properties**
M.F. TONEY, SLAC National Accelerator Laboratory, Menlo Park, CA, USA
- 16.00 *FH-2:IL18* **Highly Diffuse Fluorine-doped SnO₂ Thin Films for Photovoltaic Applications**
G. GIUSTI¹, V. CONSONNI¹, D.P. LANGLEY^{1,2}, G. REY¹, S. ZHANG¹, Y. PELLEGRIN³, N.D. NGUYEN², **D. BELLET¹**, ¹Laboratoire des Matériaux et du Génie Physique, CNRS - Grenoble INP, Grenoble Cedex, France; ²Laboratoire de Physique des Solides, Interfaces et Nanostructures, Département de Physique, Université de Liège, Liège, Belgique; ³Laboratoire Chimie et Interdisciplinarité, Synthèse, Analyse, Modélisation, CNRS - Faculté des Sciences et des Techniques de Nantes, Nantes Cedex, France
- 16.30 *FH-2:L19* **Effect of Temperature on Phase Transition of Ni-Co Oxide and Its Application on Optoelectronics**
SHU-YI TSAI¹, K.-Z. FUNG¹, C.-N. WEI², H.-Y. BOR², ¹Research Center for Energy Technology and Strategy, Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan, ROC; ²Metallurgy Section, Materials & Electro-Optics Research Division, Chung-Shan Institute of Science and Technology(CSIST), Gaoping village, Longtan Township, Taoyuan County, Taiwan, ROC
- 16.50 *Break*

Session FH-1 - Fundamentals

Chair: J. MEDVEDEVA, USA

- 17.20 *FH-1:IL11* **Advancing TCO Technologies via the Application of Atomic Layer Deposition**
M.E. PEMBLE^{1,2}, M. BARDOSOVA², S. KASSIM², H. MANLEY², J. MCGRATH², S. O'BRIEN², I.M. POVEY², C. RYAN², ¹Department of Chemistry, University College Cork, Cork, Ireland; ²Tyndall National Institute, University College Cork, Cork, Ireland
- 17.50 *FH-1:L13* **Electronic Structure of ZnO Quantum Dots Studied by High-Frequency EPR, ESE and ENDOR Spectroscopy**
P.G. BARANOV, Ioffe Physical-Technical Institute, St. Petersburg, Russia; S.B. ORLINSKII, Federal Center of Shared Facilities, Kazan State University, Kazan, Russia; C. DE MELLO DONEGÁ, Debye Institute for Nanomaterials Science, Utrecht University, Netherlands; J. SCHMIDT, Huygens Laboratory, Leiden University, Netherlands

Session FI-2 - Electro-optical Characterization

Room: **GIOVE**

Chair: **MAO-KUO WEI**, Taiwan

- 15.00 *FI-2:IL01* **Advanced Characterization Methods of InGaN-based LEDs**
JONG-IN SHIM, HYUNSUNG KIM, DONG-SOO SHIN, Hanyang University,ERICA Campus, Ansan, Korea
- 15.30 *FI-2:IL02* **Tailoring Electro-optical Properties of Cyclometalated Iridium Complexes**
E. BARANOFF, School of Chemistry, the University of Birmingham, Edgbaston, Birmingham UK
- 16.00 *FI-2:IL03* **Aberration Corrected High Resolution TEM Characterisation of Nitrides Materials and Devices**
M. ALBRECHT, T. SCHULZ, T. MARKURT, T. REMMELE, Leibniz-Institut für Kristallzüchtung, Berlin, Germany; A. DUFF, J. NEUGEBAUER, Max-Planck-Institut für Eisenforschung, Germany; F. NIPPERT, G. CALLSEN, A. HOFFMANN, Technische Universität Berlin, Fakultät II, Institut für Festkörperphysik Sekretariat EW 5-1, Berlin, Germany
- 16.30 *Break*

Session FI-1 - Material Growth and Processing

Chair: **B. WESSLER**, Germany

- 17.00 *FI-1:IL08* **DERI Method; Possible Approach to Longer Wavelength Light Emitters Based on Nitride Semiconductors**
Y. NANISHI¹, T. YAMAGUCHI², T. ARAKI¹, ¹Ritsumeikan University, Kusatsu, Japan; ²Kogakuin University, Hachioji, Japan
- 17.30 *FI-1:L11* **Monolithic White-light LED Based on GaN Doped with Beryllium**
H. TEISSEYRE^{1,2}, M. BOCKOWSKI², S. GRZANKA², I. GRZEGORY², A. KOZANECKI¹, B. DAMILAN², YA. ZHYDACHEVSKII¹, M. KUNZER⁴, K. HOLC⁴, U.T. SCHWARZ⁴, ¹Institute of Physics PAS, Warsaw, Poland; ²Institute of High Pressure PAS, Warsaw, Poland; ³CRHEA-CNRS, Valbonne Sophia Antipolis, France; ⁴Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany
- 17.50 *FI-1:L12* **Development of Organic and Inorganic Phosphors for White Emitting Blue and Near UV LEDs**
G. CHADEYRON, R. BOONSIN, J-P. ROBLIN, D. BOYER, R. MAHIOU, Clermont Université, Université Blaise Pascal, Ecole Nationale Supérieure de Chimie, Institut de Chimie (ICCF), Clermont-Ferrand, France
- 18.10 *FI-1:L13* **Steering the Si Doping of the Ultimate Solid-state Semiconductor AlN**
A. KAKANAKOVA-GEORGIEVA, R.B. DOS SANTOS, Department of Physics, Chemistry and Biology (IFM), Linköping University, Sweden; R. RIVELINO, F. DE BRITO MOTA, Instituto de Física, Universidade Federal da Bahia, Brazil; G.K. GUEORGUIEV, Department of Physics, Chemistry and Biology (IFM), Linköping University, Sweden

Session FJ-7 - Materials Modelling and Database

Room: **BARZAGLI (Hotel Croce di Malta)**

Chair: S.L. DUDAREV, UK

- 15.00 *FJ-7:IL01* **Ab Initio Modelling of Dislocations in bcc Metals**
F. WILLAIME, **L. VENDELON**, L. DÉZÉRALD, CEA Saclay, SRMP,
Gif-sur-Yvette, France; D. RODNEY, Université Claude Bernard Lyon
1, ILM, France
- 15.30 *FJ-7:IL02* **The IFMIF Project: Status and Prospects for Fusion
Materials Irradiation**
J. KNASTER, IFMIF/EVEDA, Obuchi, Rokkasho-mura, Japan
- 16.00 *FJ-7:L03* **Characterization and Modeling of the Ratcheting
Behavior of the Ferritic-martensitic Steel P91**
KUO ZHANG, J. AKTAA, Karlsruhe Institute of Technology (KIT),
Institute for Applied Materials, Eggenstein Leopoldshafen, Germany

Session FJ-10.1 - Waste Form Development, Including Glass, Ceramic, and Metallic Waste Forms

Room: **GUTTUSO (Hotel Croce di Malta)**

Chair: K. FOX, USA (*Programme Chair*)

15.00 *Welcome*

15.05 *FJ-10.1:IL01* **Selective Decontamination and Stable Solidification of Cs and Sr by Zeolites**
H. MIMURA, Tohoku University, Sendai, Japan

15.35 *FJ-10.1:IL02* **Fabrication and Chemical Durability of Ceramic Technetium-based Pyrochlores and Perovskites as Potential Waste Forms**
T. HARTMANN, I.J. ALANIZ, A.J. ALANIZ, University of Nevada - Las Vegas, Las Vegas, NV, USA

16.05 *FJ-10.1:IL03* **Recent Advances in Ceramics for Nuclear Waste Immobilization**
A. BUKAEMSKIY, S. FINKELDEI, F. BRANDT, S. NEUMEIER, G. MODOLO, D. BOSBACH, Institute of Energy and Climate Research (IEK-6) - Nuclear Waste Management and Reactor Safety, Forschungszentrum Juelich GmbH, Jülich, Germany

16.35 *FJ-10.1:IL04* **Behaviour of Fuel and Structural Materials in Severely Damaged Reactors**
N. SATO, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan

17.05 *Break*

Session FJ-10.4 - Design and Operation of Waste Immobilization facilities, Repository Design, Requirements, and Licensing

Chair: H. MIMURA, Japan

17.30 *FJ-10.4:IL01* **Progress at ANSTO on a Synroc Plant for Intermediate-level Waste from Reactor Production of ⁹⁹Mo**
E.R. VANCE, S. MORICCA, M.W.A. STEWART, ANSTO, Kirrawee DC, NSW, Australia

18.00 *FJ-10.4:IL02* **Vitrification of UK Higher Activity Wastes and the Dissolution Mechanisms of Simulant Waste Glasses in Hyper-alkaline Conditions Relevant to a Cementitious Geological Disposal Facility**
N. HYATT, Department of Materials Science & Engineering, The University of Sheffield, Sheffield, UK

18.30 *FJ-10.4:IL03* **Review of the Development of the Proposed Yucca Mountain Geologic Repository**
C.E. SANDERS, University of Nevada, Las Vegas, Las Vegas, NV, USA

19.00 *FJ-10.4:IL04* **RADON Operational Experience in High-temperature Treatment of Radioactive Wastes**
S.V. STEFANOVSKY, FSUE RADON, Moscow, Russia

Session FK-4 - Applications

Room: **URANO**

Chair: **E. GHEERAERT**, France

- 15.00 *FK-4:L13* **Carbon Nanomaterials for Capacitive Energy Storage**
Y. GOGOTSI, Dept. of Materials Science and Engineering and A.J. Drexel Nanotechnology Inst. Drexel University, Philadelphia, PA, USA
- 15.20 *FK-4:L14* **Design and Fabrication of Printed, Carbon Nanotube Transistors Operating in the GHz Range for Electronic Systems**
J. VAILLANCOURT, A. AKYURTLU, **C. ARMIENTO**, University of Massachusetts, Lowell, MA, USA
- 15.40 *FK-4:L15* **Application of Carbon-based Gradient Materials for the Design of Rail Bumpers**
P. ZAKIEWICZ, P. PACKO, K. KOZLOWSKA, **T. UHL**, Department of Robotics and Mechatronics, AGH-University of Science and Technology, Krakow, Poland; K. KYZIOL, Dept. of Material Engineering and Ceramics, AGH-University of Science and Technology, Krakow, Poland; J. MIZERA, Materials Design Division, Warsaw University of Technology, Poland
- 16.00 *FK-4:L16* **Graphene Oxides and their Hybrids for Solar to Hydrogen and CO₂ Photofixation Applications**
LI-CHYONG CHEN¹, YAN-GU LIN^{1, 2}, HSIN-CHENG HSU³, YU-CHUNG CHANG³, INDRAJIT SHOWN², CHEN-HAO WANG³, KUEI-HSIEN CHEN^{1, 2}, ¹Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; ²Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan; ³Dept. of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan
- 16.20 *Break*

Chair: **A.A. BALANDIN**, USA

- 16.50 *FK-4:L18* **Electrochemical Measurements and Metal Deposition on Graphene Layers at Liquid/Liquid Interface**
P.S. TOTH, R.A.W. DRYFE, School of Chemistry, University of Manchester, Manchester, UK
- 17.10 *FK-4:L21* **Photo-thermal Desorption of Toluene from Single Walled Carbon Nanotube Adsorbent Pads in Air Samplers**
C.T. LUNGU, J. OH, University of Alabama at Birmingham, Birmingham, AL, USA; E. FLOYD, University of Oklahoma, Oklahoma City, OK, USA
- 17.30 *FK-4:L22* **Understanding the Performance of Bucky Gel Actuators by Means of their Electrical Model**
G. BUBAK, A. ANSALDO, D. RICCI, Istituto Italiano di Tecnologia, Robotics, Brain and Cognitive Sciences Department, Genova, Italy
- 17.50 *FK-4:L23* **Surface-modified Carbon Nanotubes Multifunctional Sensor**
P. ZBYRAD^{1, 2}, K. GRABOWSKI¹, T. UHL¹, ¹AGH University of Science and Technology, Faculty of Mechanical Engineering and Robotics, ²AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland

Session FL-3 - Role of Mass and Charge Transport in Application Engineering

Room: **BARZAGLI (Hotel Croce di Malta)**

Chair: HAN-ILL YOO, Korea

- 15.00 *FL-3:IL05* **Mass and Charge Transport in Solid Oxide Fuel Cells**
T. KAWADA, Tohoku University, Sendai, Japan
- 15.30 *FL-3:IL06* **Structural and Thermochemical Constraints of Mixed Conducting BSCF and SCF Electrodes for Fuel Cells**
J. FRADE, A. YAREMCHENKO, S. MIKHALEV, Department of Materials and Ceramic Engineering, CICECO, University of Aveiro, Aveiro, Portugal
- 16.00 *FL-3:IL07* **Protonic SOFC Based on LaSrSc₃ Perovskite-type Proton Conductor**
H. YUGAMI, Graduate School of Engineering, Tohoku University, Japan; **H. KATO**, Tohoku Electric Power Co., Inc, Japan; **F. IGUCHI**, Graduate School of Engineering, Tohoku University, Japan
- 16.30 *FL-3:IL08* **Mixed Ionic Conduction for Electrochemical Membranes and Fuel Cells**
F.M.B. MARQUES, Materials and Ceramic Eng. Dept./CICECO, University of Aveiro, Aveiro, Portugal

Session FM-1 - Resistance Switching Memories (ReRAM)

Room: **ALBA 2**

Chair: **MING LIU**, China

- 15.00 *FM-1:IL08* **CBRAM vs OxRAM: Active Material Selection Depending on the Final Application**
E. VIANELLO¹, G. MOLAS¹, P. BLAISE¹, O. THOMAS¹, F. LONGNOS¹, B. TRAORE¹, G. PALMA¹, J. GUY¹, T. CABOUT¹, K. XUE¹, M. BERNARD¹, A. ROULE¹, E. SOUCHIER¹, C. CARABASSE¹, M. REYBOZ¹, H. GRAMPEIX¹, J.F. NODIN¹, A. TOFFOLI¹, E. JALAGUIER¹, O. PIRROTTA², A. PADOVANI², L. LARCHER², L. FONSECA³, Y. NISHI⁴, B. DE SALVO¹, L. PERNIOLA¹, ¹CEA, LETI, MINATEC, Grenoble, France; ²DISMI Università di Modena e Reggio Emilia, Reggio Emilia, Italy; ³State University of Campinas, Brazil; ⁴Dept. of Electrical Engineering, Stanford University, California, USA
- 15.30 *FM-1:IL09* **Evaluating I-V Relations and Defect Distribution of metal1|MIEC|metal2 Devices for Understanding the Functioning of Redox Memory Devices**
I. RIESS, D. KALAEV, Physics Department, Technion-IIT, Haifa, Israel
- 16.00 *FM-1:L10* **Bottom-up Fabrication of Metal-oxide-metal Nanowires with Controlled Resistive Switching Functionality**
S. BRIVIO¹, G. TALLARIDA¹, D. PEREGO², S. FRANZ², S. SPIGA¹, ¹Laboratorio MDM, IMM-CNR, Agrate Brianza, Italy; ²Dip.Chimica, Materiali ed Ing. Chimica "G.Natta", Politecnico di Milano, Milano, Italy
- 16.20 *FM-1:L11* **Two-terminal Non-volatile Memory Devices Using Silicon Nanowires as the Storage Medium**
K. SARANTI, S. PAUL, Emerging Technologies Research Centre, De Montfort University, The Gateway, Leicester, UK
- 16.40 *Break*

Chair: **I. RIESS**, Israel

- 17.10 *FM-1:L11b* **Stochastic Memristive Nature in Future Nanoelectronic Devices**
A. YOUNIS, DEWEI CHU, SEAN LI, School of Materials Science and Engineering, University of New South Wales, Sydney, NSW, Australia
- 17.30 *FM-1:L12* **A New Ferroelectric RRAM with Fast Switching Speed and Extremely Long Endurance Compatible to DRAM**
CHUN-HU CHENG, Department of Mechatronic Technology, National Taiwan Normal University, Taipei, Taiwan; **ALBERT CHIN**, Department of Electronics Engineering, National Chiao Tung University, Hsinchu, Taiwan
- 17.50 *FM-1:L14* **Block Copolymer Self Assembling for the Fabrication of Nanoscale HfO₂ Resistive Switching Memories**
J. FRASCAROLI^{1,2,3}, S. BRIVIO¹, F. FERRARESE LUPI¹, F. VOLPE¹, M. PEREGO¹, L. BOARINO², S. SPIGA¹, ¹Lab. MDM, IMM-CNR, Agrate Brianza, Italy; ²INRIM, NanoFacility, Division Electromagnetism, Torino, Italy; ³Università degli studi di Milano, Milano, Italy
- 18.10 *FM-1:L15* **Resistive Switching in MIM-structures Based on Hf_xAl_{1-x}O_y and TiN both Grown by ALD**
K.V. EGOROV, A.M. MARKEEV, YU.YU. LEBEDINSKII, A.V. ZABLOT-SKIY, A.A. KUZIN, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia

Session FN-5 - Vortex Lattice Physics

Room: **TORRETTA (Hotel Tamerici)**

Chair: R. ARITA, Japan

- 15.00 *FN-5:IL01* **Vortex Molecules in Layered Thin Films Superconductors**
A. BUZDIN, University of Bordeaux, LOMA, Bordeaux, France; A. MELNIKOV, A. SAMOKHVALOV, Institute for Physics of Microstructures, Nizhny Novgorod, Russia
- 15.30 *FN-5:IL02* **Vortex Structures in Iron-based Superconductors by Small-angle Neutron Scattering**
H. KAWANO-FURUKAWA, Ochanomizu University, Bunkyo-ku, Tokyo, Japan
- 16.00 *FN-5:IL03* **How the Macroscopic Current in a Superconductor Correlates with the Microscopic Flux-line Distribution: An Experimental Study**
M. ZEHETMAYER, J. HECHER, Atominstitut, Vienna University of Technology, Vienna, Austria
- 16.30 *Break*

Session FN-6 - Synthesis and Processing

Chair: HSIN LIN, Singapore

- 17.00 *FN-6:IL02* **High-resolution Electron Microscopy and Electron Energy-loss Spectroscopy as Tools to Study the Structure and Bonding Nature of Complex Oxides**
G.A. BOTTON, M. BUGNET, N. GAUQUELIN, G.Z. ZHU, Department of Materials Science and Engineering, McMaster University, Hamilton, Canada
- 17.30 *FN-6:L03* **Synthesis and Characterization of Phenacene Superconducting Hydrocarbons**
G.A. ARTIOLI, L. MALAVASI, Dip. di Chimica, Università di Pavia-INSTM UdR di Pavia, Pavia, Italy
- 17.50 *FN-6:L04* **Synthesis of MgB₂ Superconducting Materials with Zr at a Pressure of 2 GPa**
A. KOZYREV, T. PRIKHNA, E. MOSHIL, N. SERGIENKO, Institute for Superhard Materials of National Academy of Science of Ukraine, Kiev, Ukraine; W. GAWALEK, Institute for Photonic Technologies, Jena, Germany

Session FO-4 - Tissue Engineering and Regenerative Medicine

Room: **SIRIO**

Chair: **T. WEBSTER, USA**

- 15.00 *FO-4:L05* **Bioglass Scaffolds Reinforced by Microfibrillated Cellulose Coating**
L. BERTOLLA, I. DLOUHÝ, Institute of Physics of Materials ASCR, Brno, Czech Republic; A. PHILIPPART, A.R. BOCCACCINI, Institute of Biomaterials, Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Erlangen, Germany
- 15.20 *FO-4:L07* **Development of Biomimetic 45S5 Bioglass® and Boron-containing Bioactive Glass Scaffolds by Surface Functionalization with Alkaline Phosphatase for Bone Tissue Engineering Applications**
P. BALASUBRAMANIAN¹, L. HUPA², A.R. BOCCACCINI¹, ¹Department of Materials Science and Engineering, Institute of Biomaterials, Friedrich-Alexander-University of Erlangen-Nürnberg, Erlangen, Germany; ²Abo Akademi University, Finland
- 15.40 *FO-4:L08* **Novel Microfabrication of 3D Composite Lattice Scaffold for Bone Tissue Engineering**
D. NADEEM¹, M. DALBY², GANG LI³, **BO SU**¹, ¹Biomaterials Eng. Group, School of Oral & Dental Sciences, University of Bristol, UK; ²Centre for Cell Engineering, University of Glasgow, UK; ³School of Biomedical Sciences, Chinese University of Hong Kong, China
- 16.00 *FO-4:L09* **Polymer-based Scaffolds with Vascular Network for Bone Tissue Engineering**
I. GERGES¹, M. TAMPLENIZZA¹, C. RECORDATI¹, A. TOCCHIO^{1,2}, F. MARTELLO¹, P. MILANI^{1,3}, **C. LENARDI**^{1,3}, ¹Fondazione Filarete, Milano, Italy; ²SEMM, European School of Molecular Medicine, Campus IFOM-IEO, Milano, Italy; ³CIMaNa and Dipartimento di Fisica, Università degli Studi di Milano, Milano, Italy
- 16.20 *Break*

Session FO-7 - Progress in Implant Prostheses

Chair: **S. BEST, UK**

- 16.50 *FO-7:IL01* **Electrochemically Deposited Calcium Phosphate Coatings for Orthopedic and Dental Implants**
N. ELIAZ, Dept. Materials Science and Engineering, Tel-Aviv University, Ramat Aviv, Tel Aviv, Israel
- 17.20 *FO-7:IL02* **Cortical-bone-mimetic Hierarchical Composites**
E. JABBARI, Chemical Engineering Department, University of South Carolina, Columbia, SC, USA
- 17.50 *FO-7:IL03* **Polyacrylamide Hydrogels as Artificial Muscles: Sensing and Actuation**
M. BASSIL, G. AZZI, M. EL TAHCHI, LBMI, Department of Physics, Lebanese University, Faculty of Sciences II, Jdeidet, Lebanon
- 18.20 *FO-7:L04* **Mechanical Behaviour of Alumina Toughened Zirconia Nanocomposites with Different Alumina Additions**
L.A. DIAZ¹, S. RIVERA², A. FERNÁNDEZ¹, A. OKUNKOVA³, YU.G. VLADIMIROV³, R. TORRECILLAS^{1,3}, ¹CINN-CSIC, Universidad de Oviedo, Llanera, Asturias, Spain; ²Nanoker Research, S.L., Polígono de Olloniego, Oviedo, Asturias, Spain; ³Moscow State University of Technology "STANKIN", Moscow, Moscow Oblast, Russian Fed.

Session FO-8.4 - Biomedical Applications Based on Degradable, Stimuli-responsive Polymers

Room: ORSA MAGGIORE

Chair: WEI MIN HUANG, Singapore

- 15.00 *FO-8.4:IL01* **Thermoresponsive Nanonets for Nano- to Micro-scale Delivery of Therapeutics**
G. AMEER, Institute for BioNanotechnology in Medicine, Chemistry of Life Processes Institute, Northwestern University, Evanston, IL, USA
- 15.30 *FO-8.4:L03* **Adhesive, Degradable Catecholamine Biopolymers as Hemostat, Gene Vector, and Encapsulation Agent**
HAESHIN LEE, Department of Chemistry, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea
- 15.50 *FO-8.4:L04* **Biodegradable Coating Loaded with Cephalexin on Magnesium Alloy for Biomedical Implants**
A. ZOMORODIAN¹, C. SANTOS^{1,2}, M.J. CARMEZIM^{1,2}, T. MOURA E SILVA^{1,3}, J.C.S. FERNANDES¹, M.F. MONTEMOR¹, ¹ICEMS/DEQB, Instituto Superior Técnico, Technical University of Lisbon, Av. Rovisco Pais, Lisboa, Portugal; ²Instituto Politécnico de Setúbal, DEM, ESTSetúbal, Portugal; ³Instituto Superior de Engenharia de Lisboa, Dep. Mech. Engineering, DEM, Lisboa, Portugal
- 16.10 *FO-8.4:L05* **Microparticles from Photocrosslinked Polyesters**
F. FRIESS^{1,2}, A. LENDLEIN^{1,2}, C. WISCHKE¹, ¹Institute of Biomaterial Science and Berlin-Brandenburg Centre for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany; ²Institute of Chemistry, University of Potsdam, Potsdam, Germany
- 16.30 *Break*

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Chair: G. AMEER, USA

- 17.00 *FO-8.4:IL06* **Multifunctional Gene Nanoparticles to Mediate Proliferation and Migration of Human Vascular Endothelial Cells**
YAKAI FENG^{1, 2, 3}, CHANGCAN SHI¹, QIAN LI¹, JING YANG¹, JUAN LV¹, MUSAMMIR KHAN¹, HAIXIA WANG¹, XIANGKUI REN¹, WENCHENG ZHANG⁴, ¹School of Chemical Engineering and Technology, Tianjin University, Tianjin, China; ²Key Laboratory of Systems Bioengineering of Ministry of Education, Tianjin University, Tianjin, China; ³Tianjin University-Helmholtz-Zentrum Geesthacht, Joint Laboratory for Biomaterials and Regenerative Medicine, Tianjin, China; ⁴Graduate School of Tianjin Medical University, Tianjin, China; ⁵Department of Physiology and Pathophysiology, Logistics University of Chinese People's Armed Police Force, Tianjin, China
- 17.30 *FO-8.4:L07* **Assessment of Biodegradable Materials for Next Generation of Artificial Muscles**
L.D. CHAMBERS, J. WINFIELD, I. IEROPOULOS, J. ROSSITER, Bristol Robotics Laboratory, University of Bristol, Bristol, UK; Bristol Robotics Laboratory, University of the West of England, Bristol, UK
- 17.50 *FO-8.4:L08* **Bicompatibility of a Degradable Poly[(L-lactide)-co-glycolide] Network**
S. BRAUNE, S. DIETZE, T. ROCH, A. KRÜGER, S. BAUDIS, M. BEHL, K. KRATZ, F. JUNG, A. LENDLEIN, Institute of Biomaterial Science and Berlin-Brandenburg Center for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany
- 18.10 *FO-8.4:L09* **Oligotetrahydrofurane Based Shape-memory Hydrogels**
M. BALK^{1, 2}, M. BEHL^{1, 2}, U. NÖCHEL¹, A. LENDLEIN^{1, 2, 3}, ¹Institute of Biomaterial Science, Helmholtz-Zentrum Geesthacht, Teltow, Germany; ²Tianjin University - Helmholtz-Zentrum Geesthacht, Joint Laboratory for Biomaterials and Regenerative Medicine; ³Berlin-Brandenburg Center for Regenerative Therapies (BCRT), Teltow, Germany

Session FO-9.3 - Wearable and Implantable Sensor Systems

Room: **BUENO (Hotel Croce di Malta)**

Chair: D. DIAMOND, Ireland

- 15.00 *FO-9.3:IL01* **Ambulatory Sensing in Balance Control and Fall Prevention; Application in Parkinson's Disease**
L. CHIARI, Department of Electrical, Electronic, and Information Engineering - Guglielmo Marconi (DEI) & Health Sciences and Technologies - Interdepartmental Center for Industrial Research (HST-ICIR) Università di Bologna, Bologna, Italy
- 15.30 *FO-9.3:L02* **Fluctuations in Frequency Composition of Neural Activity Observed by Portable Brain Intention Detection Device**
R.A. SHOURESHI, New York Institute of Technology, Old Westbury, New York, USA; C.M. AASTED, Center for Pain and the Brain, Harvard Medical School and P.A.I.N. Group, Boston Children's Hospital, Boston, MA, USA
- 15.50 *FO-9.3:L03* **Metallization on Polymer Substrates for Functional Contact Lenses**
S. TINKU, C. COLLINI, S. PEDROTTI, L. LORENZELLI, Center for Materials and Microsystems, Fondazione Bruno Kessler, Trento, Italy; R.S. DAHIYA, Electronics and Nanoscale Engineering, University of Glasgow, UK
- 16.10 *Break*

Chair: L. CHIARI, Italy

- 16.40 *FO-9.3:L04* **Mobile Health: Design of In-body Wearable Sensor System by Flexible and Stretchable Electronics**
C.C.Y. POON^{1,2}, NINGQI LUO², NI ZHAO², ¹Department of Surgery, The Chinese University of Hong Kong, HKSAR; ²Department of Electronic Engineering, The Chinese University of Hong Kong, HKSAR
- 17.00 *FO-9.3:IL06* **Pervasive Sensors for Real Time Monitoring**
F. DI FRANCESCO¹, P. SALVO¹, N. CALISI¹, B. MELAI¹, S. GHIMENTI¹, V. CASTELVETRO¹, S. BIANCHI¹, A. PUCCI¹, C. CHIAPPE¹, R. FUOCO¹, M. CORREVON², G. DUDNIK², G. VOIRIN², I. TEXIER³, P. MARCOUX³, P. PHAM³, N. BUE⁴, J. CRISTENSEN⁴, M. LAURENZA^{5,6}, A. RAPTOPOULOS⁷, A. BARTZAS⁷, D. SOUDRIS⁸, C. SAXBY⁹, T. NAVARRO¹⁰, M. ROMANELLI¹¹, V. DINI¹¹, A. PAOLICCHI¹², M. MULLER¹³, P.-Y. BENHAMOU¹³, L. LYMPEROPOULOS⁷, ¹Univ. of Pisa, Dip. Chim. e Chim. Ind. Pisa, Italy; ²Centre Suisse d'Electr. et de Microtech., Neuchâtel, Switzerland; ³CEA Leti, Grenoble, France; ⁴European Wound Management Ass., Frederiksberg, Denmark; ⁵Euroresearch, Milano, Italy; ⁶Haemopharm Biofluids, Tovo di S. Agata, Italy; ⁷EXUS, Athens, Greece; ⁸National Technical Univ. of Athens / ICCS, Athens, Greece; ⁹Smith and Nephew Wound Management, Hull, UK; ¹⁰Swissinnov, Gland, Switzerland; ¹¹Univ. of Pisa, Clinica Dermatologica, Pisa, Italy; ¹²Univ. of Pisa, Dept. of Translational Research and New Tech. in Medicine and Surgery, Pisa, Italy; ¹³Clinique d'Endocrinologie Diabetologie, Pôle DigiDune, CHU de Grenoble, Grenoble, France
- 17.30 *FO-9.3:L07* **Soft Conductive Polymer Dry Electrodes for High-quality and Comfortable ECG/EEG Measurements**
YUN-HSUAN CHEN¹, M. OP DE BEECK², L. VANDERHEYDEN³, H. VANDORMAEL³, C. VAN HOOFF¹, ¹Imec & Electrical Eng. Dept., KU Leuven, both at Leuven, Belgium; ²imec, Leuven, Belgium; ³Dept. of R&D and Innovation, Datwyler Sealing Solutions, Alken, Belgium

Special Session FA-4 - DURAMET Workshop on Direct Alcohol Fuel Cells (DAFCs)

Room: **AUDITORIUM**

Chair: H. GASTEIGER, Germany

8.30 FA-4:IL01 The Long Way of Achieving a Durability of 20,000 h in a DMFC System

M. MÜLLER, N. KIMIAIE, A. GLÜSEN, Institute of Energy and Climate Research, Juelich Research Center, Germany; D. STOLTEN, Director Institute for Electrochemical Process Engineering, Juelich Research Center & Chair for Fuel Cells, Aachen University, Germany

9.00 FA-4:L02 Improved Durability and Cost-effective Components for New Generation Direct Methanol Fuel Cells - DURAMET Project

A.S. ARICO', CNR-ITAE, Messina, Italy

9.20 FA-4:L03 DMFC Degradation and Lifetime Studies

J.L. BONDE, IRD Fuel Cells, Svendborg, Denmark

9.40 Break

Chair: E. PASTOR, Spain

10.10 FA-4:IL05 Methanol-tolerant Cathode Catalysts for DMFC

J. MA, A. HABRIOUX, C. MORAIS, **N. ALONSO-VANTE**, IC2MP, UMR-CNRS 7285, University of Poitiers, Poitiers, France

10.40 FA-4:L06 DECORE: A New European Project Aiming at Innovative DEFCs Operating at Intermediate Temperatures

G. GRANOZZI, Dept. Chemical Sciences, University of Padova, Italy

11.00 FA-4:L07 3D Direct Methanol Fuel Cell (DMFC) Validation Model for Analyzing New Materials and Components

N.S. VASILE, A.H.A. MONTEVERDE VIDELA, **S. SPECCHIA**, Politecnico di Torino, Dept. Applied Science and Technology, Torino, Italy

11.20 FA-4:L08 Impact of N/Zr Atomic Ratio on the Oxygen Reduction Reaction Activity of Heat-treated Carbon-supported Zr-oxyphthalocyanine

T. MITTERMEIER, C. DENK, XIAODONG WANG, H. BEYER, P. MADKIKAR, M.PIANA, H.A. GASTEIGER, Technische Universität München, Garching, Germany

11.40 FA-4:L09 Direct Methanol Fuel Cell Stack Design and Test in the framework of DURAMET Project

O. BARBERA, A. STASSI, V. BAGLIO, D. SEBASTIAN, A.S. ARICO', CNR- ITAE, Messina, Italy

12.00 FA-4:L10 Enhanced Proton Transport and Water Retention in Nanocomposite Membranes for HT-PEMFCs using Organomodified Layered nanostructures

I. NICOTERA, I. NICOTERA, K. ANGJELI, C. SIMARI, L. COPPOLA, G.A. RANIERI, University of Calabria, Rende (CS), Italy

12.20 FA-4:L11 Synthesis and Characterization of ZrO₂ Nanoparticles from an Organometallic Precursor as ORR-Selective Catalysts for DMFCs

P. MADKIKAR, T. MITTERMEIER, C. DENK, X. WANG, M. PIANA, H.A. GASTEIGER, Technische Universität München, Institute of Technical Electrochemistry, Garching, Germany

Sub-Session FB-2.4 - Carbon Based Materials and Other High Surface Area Adsorbents

Room: **LE PLEIADI**

Chair: **A. ZUETTEL**, Switzerland

9.00 FB-2.4:IL05 Activated Carbon Fibre Monoliths for Hydrogen Storage

M. KUNOWSKY, J.P. MARCO-LOZAR, **A. LINARES-SOLANO**,
University of Alicante, Alicante, Spain

9.30 FB-2.4:IL08 Hydrogen Storage in Metal-organic Frameworks

MYUNGHYUN PAIK SUH, Department of Chemistry, Seoul National
University, Seoul, Republic of Korea

10.00 Break

Sub-Session FB-2.5 - Theoretical Modelling, New Characterization Methods and Storage Testing

Chair: **P. JENA**, USA

10.30 FB-2.5:IL01 Analyzing Pure and Doped Aluminum Clusters as Potential Hydrogen Storage Materials

A. GOLDBERG, M.D. HALLS, Schrodinger Inc., San Diego, CA,
USA

11.00 FB-2.5:L02 Thermodynamic Modelling of Borohydrides for Hydrogen STORAGE

E.R. PINATEL, E. ALBANESE, B. CIVALLERI, M. BARICCO, Dipar-
timento di Chimica and NIS, Università di Torino, Torino, Italy

11.20 FB-2.5:L04 Theoretical Study of the SmCo₅H_x Compounds: Cohesive and Magnetic Properties

G.I. MILETIC, Laboratory for Solid State and Complex Compounds
Chemistry, Division of Materials Chemistry, Institute Rudjer Bosko-
viæ, Zagreb, Croatia

11.40 FB-2.5:L05 Nanoconfined Complex Hydrides via Inverse Atomistic Calculations

Z. LODZIANA, P. BLOŃSKI, Polish Academy of Sciences, Institute
of Nuclear Physics, Kraków, Poland

Session FC-1 - Batteries

Room: GIOVE

Chair: M. DOLLE', Canada

8.30 *FC-1:IL33* **Supercapattery: Electrochemical Energy Storage beyond Battery and Supercapacitor**

G.Z. CHEN, Department of Chemical and Environmental Engineering, and Energy and Sustainability Research Division, Faculty of Engineering, University of Nottingham, Nottingham, UK

9.00 *FC-1:L34* **A New Fabrication Route for High-quality Crystal Layers of Li₄Ti₅O₁₂ directly on a Current Collector as well as their All-solid-state Lithium Ion Battery Properties**

N. ZETTSU^{1,2}, H. KOJIMA¹, S. NOZAKI¹, K. TESHIMA^{1,2}, ¹Shinshu University, Nagano, Japan; ²CREST, Japan Society and Technological Agency

9.20 *Break*

Session FC-2 - Supercapacitors

Chair: T. BROUSSE, France

9.50 *FC-2:IL07* **Modeling Ion Adsorption and Dynamics in Nanoporous Carbon Electrodes**

C. PÉAN^{1,2,3}, C. MERLET^{1,2}, B. ROTENBERG^{1,2}, P. SIMON^{2,3}, **M. SALANNE**^{1,2}, ¹PHENIX laboratory, Université Pierre et Marie Curie, Paris, France; ²French Research Network on Electrochemical Energy Storage (RS2E), FR CNRS 3459, France; ³CIRIMAT Laboratory, Université Paul Sabatier, Toulouse, France

10.20 *FC-2:IL08* **Synthesis and Electrochemical Properties of Graphene-based Composites for Supercapacitors**

SANG-HOON PARK, CHANG WOOK LEE, HEE CHANG YOUN, HYUN-KYUNG KIM, SEOK WOO LEE, **KWANG-BUM KIM**, Laboratory of Energy Conversion and Storage Materials, Department of Material Science and Engineering, Yonsei University, Seoul, Korea

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

Room: ORSA MINORE

Chair: M. WINKLER, Germany

- 8.30 *FD-2:IL22* **New Routes to High Performance, Low Cost Thermoelectrics Based on Natural Minerals**
D.T. MORELLI, Michigan State University, East Lansing, MI, USA
- 9.00 *FD-2:L23* **Enhanced Phonon Scattering in “Rattling” Oxides for Thermoelectric Energy Conversion**
M. OHTAKI, K. MIZUTA, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Fukuoka, Japan
- 9.20 *FD-2:L24* **Thermoelectric Clathrates - The State of the Art**
P. ROGL, Christian Doppler Laboratory for Thermoelectrics; Institute of Physical Chemistry, University of Vienna, Wien, Austria
- 9.40 *FD-2:L25* **Application of Strong Gravitational Field for the Preparation of Gradient Thermoelectric Materials**
K. JANUSZKO, A. STABRAWA, K.T. WOJCIECHOWSKI, AGH Univ. of Science and Technology, Fac. of Materials Science and Ceramics, Cracow, Poland; Y. OGATA, T. MASHIMO, Kumamoto Univ., Shock Wave and Condensed Matter Research Center, Kumamoto, Japan
- 10.00 *Break*

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

Chair: LIDONG CHEN, China

- 10.30 *FD-3:IL05* **Development of Thermoelectric Generation for Waste Recovery**
R. FUNAHASHI, National Institute of Advanced Industrial Science and Technology, Ikeda, Osaka, Japan
- 11.00 *FD-3:IL06* **Development of High-efficiency Segmented Thermoelectric Couples for Radioisotope Thermoelectric Generators**
T. CAILLAT, S. FIRDOSY, B.C-Y. LI, C.-K. HUANG, V. RAVI, N. KEYAWA, P. GOGNA, J. PAIK, J. CHASE, D. UHL, J. NI, K. SMITH, J.-P. FLEURIAL, Jet Propulsion Laboratory/Caltech, MS 277-207, Pasadena, CA, USA
- 11.30 *FD-3:L07* **Spacer-inserted Thermoelectric Device with Enhanced Power Generation and Material Efficiency**
HOON KIM, **WOCHUL KIM**, School of Mechanical Engineering, Yonsei University, Seoul, Republic of Korea
- 11.50 *FD-3:L08* **Preparation of Mg₂Si Film by Friction Film Forming Method**
M. TAKAHASHI, Graduate School, Kogakuin University, Hachioji, Tokyo, Japan; H. KOHRI, T. YAGASAKI, Faculty of Engineering, Kogakuin University, Japan
- 12.10 *FD-3:L09* **Advanced Thermionic and Thermoelectric Conversion Module for Concentrating Solar Systems**
D.M. TRUCCHI, A. BELLUCCI, P. CALVANI, E. CAPPELLI, V. VALENTINI, IMIP-CNR, Monterotondo Scalo (RM), Italy; S. ORLANDO, IMIP-CNR, Potenza Section (PZ), Italy; L. SILVESTRONI, D. SCITI, ISTEC-CNR, Faenza (RA), Italy; R. YOGEV, A. KRIBUS, Tel Aviv University, Dept. of Mechanical Eng, Israel

Session FE-3 - Design Approaches for Advanced Applications

Room: ORSA MAGGIORE

Chair: E. KOWALSKA, Japan

9.00 FE-3:IL05 New Tandem Devices for Water Splitting

P.C.K. VESBORG¹, B. SEGER¹, T. PEDERSEN¹, A.B. LAURSEN², O. HANSEN¹, I. CHORKENDORFF¹, ¹Technical University of Denmark, Kgs. Lyngby, Denmark; ²Rutgers, USA

9.30 FE-3:IL06 Hybrid Materials with Organized Nanoscale Architecture for Solar Energy Applications

C. JANAKY, G.F. SAMU, K. RAJESHWAR, Dept. of Physical Chemistry and Materials Science, University of Szeged, Szeged, Hungary; Dept. Chemistry and Biochemistry, University of Texas at Arlington, Arlington, TX, USA

10.00 FE-3:L08 Bio-organic Hybrid Photoconverters from Organic Dyes and a Bacterial Photoenzyme

G. FARINOLA^{1,2}, A. OPERAMOLLA¹, O. HASSAN OMAR², F. MILANO³, R.R. TANGORRA¹, R. RAGNI¹, S. LA GATTA¹, A. AGOSTIANO^{1,3}, M. TROTTA³, ¹Dipartimento di Chimica Università degli Studi di Bari Aldo Moro, Bari, Italy; ²CNR ICCOM Bari, Bari, Italy; ³CNR IPCF Bari, Bari, Italy

10.20 Break

Chair: P.C.K. VESBORG, USA

10.50 FE-3:L09 Development of Self-supporting TiO₂ Foams

T. TYTGAT, S. LENAERTS, Dept. of Bio-science Engineering, University Antwerp, Antwerp, Belgium

11.10 FE-3:L10 Photodegradation of In-door Nitrous Oxide and Formaldehyde by Using Naturally-doped Nd And Zr Anatase and Rutile Nanotitania

M.S. MEOR YUSOFF, A. SAPIEE, Malaysian Nuclear Agency, Kajang, Selangor, Malaysia

11.30 FE-3:L11 Degradation of Pesticides, Dye Molecules and Relevant Surface Interactions with Mesoporous Titania

M. MEIRE, P. LOMMENS, I. VAN DRIESSCHE, SCRiPTS, Department of Inorganic and Physical Chemistry, Ghent University, Ghent, Belgium; I. ASCOOP, P. VAN DER VOORT, COMOC, Department of Inorganic and Physical Chemistry, Ghent University, Ghent, Belgium

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

Room: **TETTUCCIO (Hotel Tamerici)**

Chair: F. ALBERTINI, Italy

9.00 *FF-4:IL02* **Advances in Magnetic Refrigeration Technology**
A. KEDOUS-LEBOUC, M. ALMANZA, A.T. RAMINOSOA, J.-P. YONNET, Grenoble Electrical Engineering Laboratory G2Elab, Grenoble Alpes University, CNRS UMR 5269, Saint Martin d'Hères Cedex, France

9.30 *FF-4:IL05* **Energy Harvesting by Ferromagnetic Shape Memory Alloy Films**
M. KOHL, M. GUETIG, R. YIN, Karlsruhe Institute of Technology, IMT, Karlsruhe, Germany; M. OHTSUKA, H. MIKI, Tohoku University, IMRAM, Sendai, Japan

10.00 *Break*

10.30 *FF-4:IL06* **Magnetic Shape Memory (MSM) Devices for Energy Harvesting**
K. ULLAKKO, Lappeenranta University of Technology, Savonlinna, Finland

11.00 *FF-4:L07* **Energy Harvesting Device Based on Nanocrystalline Ribbons**
H. CHIRIAC, M. TIBU, N. LUPU, T.A. OVARI, National Institute of Research and Development for Technical Physics, Iasi, Romania; I. SKORVANEK, Institute of Experimental Physics, Slovak Academy of Sciences, Kosice, Slovakia

11.20 *FF-4:L08* **Is the Spin Seebeck Effect a New Route to Explore for Thermoelectrics?**
K. MORRISON, **A. CARUANA**, Physics Department, Loughborough University, Loughborough, Leicestershire, UK

Session FH-3 - Device Development and Applications

Room: **VENERE**

Chair: **M. HASEGAWA**, Japan

- 8.30 *FH-3:IL01* **Developing New TCOs for Renewable Applications**
D. GINLEY, A. ZAKUTAYEV, N. WIDJONARKO, P. NDIONE, A. SIGDEL, P. PARILLA, J. BERRY, S. LANY, T. GENNETT, D. OLSON, **J. PERKINS**, NREL, Golden, CO, USA
- 9.00 *FH-3:IL02* **Advances in Photocatalytic Applications Utilizing Metal Oxide Compounds**
G. KIRIAKIDIS^{1,2}, V. BINAS¹, ¹Institute of Electronic Structure and Laser (IESL), Foundation for Research and Technology (FORTH), Vasilika Vouton, Heraklion, Crete, Greece; ²University of Crete, Physics Department, Heraklion, Crete, Greece
- 9.30 *FH-3:IL03* **Preparation and Optical Characterization of ZnO Nanowires for Sensing and Optoelectronic Applications**
C. BARATTO^{1,2}, E. COMINI^{2,1}, I. CONCINA, M. FERRONI^{2,1}, G. FAGLIA^{2,1}, V. GALSTYAN^{2,1}, R. KUMAR^{2,1}, A. PONZONI^{2,1}, A. VOMIERO^{2,1}, D. ZAPPA^{2,1}, **G. SBERVEGLIERI**^{2,1}, ¹CNR INO, SENSOR, Brescia, Italy; ²University of Brescia, Dept. of Information Engineering, Brescia, Italy
- 10.00 *FH-3:IL04* **CMOS Oxides used for Amplifiers and Logic Circuits on Paper**
R. MARTINS¹, A. NATHAN², P. BARQUINHA¹, L. PEREIRA¹, E. FORTUNATO¹, ¹CENIMAT/I3N, Departamento de Ciência dos Materiais, Faculdade de Ciências e Tecnologia (FCT), Universidade Nova de Lisboa (UNL), Caparica, Portugal; ²Department of Engineering, Cambridge University, Cambridge, UK
- 10.30 *Break*

Chair: **J. PERKINS**, USA

- 11.00 *FH-3:IL06* **All Amorphous Metal Oxide p-n Diodes**
M. GRUNDMANN, Universität Leipzig, Institut für Experimentelle Physik II, Leipzig, Germany
- 11.30 *FH-3:IL07* **Preparation of Large Area Graphene by a Roll-to-roll Microwave Plasma Chemical Vapor Deposition for Transparent Electrode Applications**
M. HASEGAWA, Nanotube Research Center, National Institute of Advance Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan
- 12.00 *FH-3:L08* **Transparent P-type Cu₂O/SnO Bilayer Thin Film Transistors**
H.A. AL-JAWHARI, J.A. CARAVEO-FRESCAS, M.N. HEDHILI, H.N. ALSHAREEF, Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia; Materials Science and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia

Session FI-2 - Electro-optical Characterization

Room: ZENITH

Chair: E. BARANOFF, UK

- 8.30 FI-2:IL04 **Novel Microlenses for Light Extraction in OLED Lighting**
MAO-KUO WEI, Dept. of Materials Science and Engineering, National Dong Hwa University, Taiwan, ROC; **JIUN-HAW LEE**, **HOANG-YAN LIN**, Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan, ROC
- 9.00 FI-2:IL05 **Terahertz Spectroscopy Study of Semiconductor Nanostructures**
XINHAI ZHANG, Dept. of Electrical and Electronic Engineering, South University of Science and Technology of China, Shenzhen, China
- 9.30 FI-2:L06 **Hydrogen Trap Mediated Cathodoluminescence Kinetics in Mg Doped p-type GaN**
M.R. PHILLIPS¹, **C. NENSTIEL**^{1,2}, **M. HOFFMANN**^{2,3}, **G. CALLSEN**^{1,2}, **M. WINTREBERT-FOUQUET**⁴, **C.TON-THAT**¹, **A. HOFFMANN**²,
¹Microstructural Analysis Unit, University of Technology, Sydney, Broadway, Australia; ²Technische Universität Berlin, Department of Solid State Physics, Berlin, Germany; ³Material Science and Engineering, North Carolina State University, Raleigh, NC, USA; ⁴BluGlass Limited, Silverwater, NSW, Australia
- 9.50 FI-2:L07 **Human- and Artwork-friendly Lighting Sources Based on Candle Light-style OLED**
JWO-HUEI JOU, Department of Materials Science and Engineering, National Tsing Hua University, Hsin-Chu, Taiwan, ROC
- 10.10 Break

Session FI-3 - Device Structures and Manufacturing

Chair: A. HOFFMANN, Germany

- 10.40 FI-3:IL01 **Nano Technologies for Light Extractions in OLEDs**
JIN-WOOK SHIN, **DOO-HEE CHO**, **CHUL WOONG JOO**, **JAEHYUN MOON**, **SEUNK KOO PARK**, **JONGHEE LEE**, **JUN-HAN HAN**, **NAM SUNG CHO**, **JOOHYUN HWANG**, **JIN WOO HUH**, **HYE YONG CHU**, **JEONG-IK LEE**, ETRI, Daejeon, Korea
- 11.10 FI-3:IL02 **Microstructured GaN Light Emitting Diodes for Visible Light Communications and Solid State Lighting**
M.D. DAWSON, Institute of Photonics, University of Strathclyde, Wolfson Centre, Glasgow, UK
- 11.40 FI-3:IL03 **InGaN/GaN Quantum Dot and Nanowire LEDs and Lasers**
P. BHATTACHARYA, **T. FROST**, **A. BANERJEE**, **S. JAHANGIR**, Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI, USA
- 12.10 FI-3:L04 **Electrically Pumped Low-threshold Random Lasing from Hydrothermal ZnO Film**
CANXING WANG, **YANG YANG**, **XIANGYANG MA**, **DEREN YANG**, State Key Laboratory of Silicon Materials and Department of Materials Science and Engineering, Zhejiang University, Hangzhou, China

Session FJ-6 - Radiation Effects

Room: **GUTTUSO (Hotel Croce di Malta)**

Chair: E. GAGANIDZE, Germany

9.00 *FJ-6:IL06* **Neutron Induced Degradation of Plasma Facing Materials and Components**

G. PINTSUK, J. LINKE, M. RÖDIG, Forschungszentrum Jülich, Euratom Association, Jülich, Germany

9.30 *FJ-6:L07* **Experiments for Helium Bubble Formation in the Microstructure of EUROFER97 with Dual-beam Injection**

O. TRÖBER, C. DETHLOFF, E. GAGANIDZE, J. AKTAA, Karlsruhe Institute for Technology, Institute for Applied Materials, Karlsruhe, Baden-Württemberg, Germany; D. BRIMBAL, P. TROCELLIER, L. BECK, CEA, DEN, Service de Recherches de Métallurgie Physique, Laboratoire JANNUS, Gif-sur-Yvette, France

9.50 *FJ-6:L08* **Evolution of Microstructure and Nanohardness in Hastelloy N Alloy under Xe26+ Ion Irradiation**

HEFEI HUANG, D.H. LI, J.J. LI, R.D. LIU, G.H. LEI, S.X. HE, Q. HUANG, L. YAN, Division of Nuclear Materials Science and Engineering, Shanghai Institute of Applied Physics, Chinese Academy of Science, Jiading district, Shanghai, China

10.10 *Break*

Session FJ-7 - Materials Modelling and Database

Chair: L. VENDELON, France

10.40 *FJ-7:IL04* **Modeling of Radiation Effects in SiC**

I. SZLUFARSKA, D. MORGAN, M.J. ZHENG, C. JIANG, Department of Materials Science and Engineering, University of Wisconsin, Madison, WI, USA

11.10 *FJ-7:IL05* **Impact of Materials Modelling on Fusion Reactor Design**

S.L. DUDAREV, EURATOM/CCFE Fusion Association, Culham Science Centre, Abingdon, Oxfordshire, UK

11.40 *FJ-5:IL06* **Ab Initio Modelling of H and He Effects in Ferritic Alloys**

CHU-CHUN FU, E. HAYWARD, LEI ZHANG, CEA, DEN, Service de Recherches de Métallurgie Physique, Gif sur Yvette, France

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

12.10 *FJ-2:L06b* **Effects of Zr Addition on Mechanical Behavior of Reduced-activation Ferritic-martensitic Steel**

YOUNG-BUM CHUN¹, S.H. KANG¹, S. NOH¹, T.K. KIM¹, D.W. LEE², S. CHO³, Y.H. JEONG¹, ¹Nuclear Materials Division, Korea Atomic Energy Research Institute, Daejeon, Korea; ²Nuclear Fusion Engineering Development Division, Korea Atomic Energy Research Institute, Daejeon, South Korea; ³National Fusion Research Institute, Daejeon, Korea

Session FJ-10.1 - Waste Form Development, Including Glass, Ceramic, and Metallic Waste Forms

Room: **BARZAGLI (Hotel Croce di Malta)**

Chair: T. HARTMANN, USA

- 8.45 *FJ-10.1:L05* **Cost-effective and Permanently Safe Containerization of Nuclear Solid Waste Using MgAl₂O₄ Spinel Ceramics**
A. ROKHVARGER, E. VAUGHN-FLAM, Rokon Systems, Inc., New York, NY, USA
- 9.05 *FJ-10.1:L06* **A New Matrix for Conditioning Chloride Salt Wastes from the Electrefining of Spent Nuclear Fuel**
G. DE ANGELIS, M. CAPONE, C. FEDELI, G.A. MARZO, ENEA, Centro Ricerche Casaccia, Roma, Italy; M. MARIANI, E. MACERATA, M. GIOLA, Politecnico di Milano, Milano, Italy
- 9.25 *FJ-10.1:L07* **Structure Determination of (Al, Nd)-doped Zirconolite Grown from CaO-SiO₂-Al₂O₃-TiO₂-ZrO₂-Nd₂O₃-Na₂O Glass**
CHANGZHONG LIAO, KAIMIN SHIH, Department of Civil Engineering, The University of Hong Kong, Hong Kong

9.45 *Break*

Session FJ-10.2 - Challenging Waste Constituents, such as Actinides, Noble Metals, and Volatile Species

Chair: G.R. LUMPKIN, Australia

- 10.15 *FJ-10.2:IL01* **Recent Developments in the Glass Formulation for the Hanford Tank Waste Treatment and Immobilization Plant and their Impacts on its Mission**
J.D. VIENNA, D.S. KIM, PNNL, Richland, WA, USA; A.A. KRUGER, US DOE/ORP, Richland, WA, USA
- 10.45 *FJ-10.2:IL03* **Adsorption Materials Development for the Separation of Actinides and Specific Fission Products from High Level Waste**
YUE-ZHOU WEI, School of Nuclear Science and Engineering, Shanghai Jiao Tong University, Shanghai, China
- 11.15 *FJ-10.2:IL04* **Actinides and Actinide Surrogates Solubilities in Borosilicate Glass**
A. KIDARI, **I. BARDEZ-GIBOIRE**, M. MAGNIN, J-L. DUSSOSSOY, CEA, DEN, DTCD/SECM/LDMC - Marcoule, Bagnols-sur-Cèze, France
- 11.45 *FJ-10.2:IL05* **Silver-functionalized Silica Aerogel as a Mean to Capture and Immobilize Iodine-129**
J. MATYAS, Pacific Northwest National Laboratory, Richland, WA, USA

Session FK-4 - Applications

Room: **URANO**

Chair: **M.L. TERRANOVA**, Italy

- 8.30 *FK-4:IL02* **Boron Doped Diamond Biotechnology: From Sensors to Neurointerfaces**
P. BERGONZO, C. HÉBERT, E. SCORSONE, H. GIRARD, CEA LIST, Diamond Sensors Laboratory, Gif-sur-Yvette, France; L. ROUSSEAU, M. COTTANCE, G. LISSORGUES, ESIEE-Paris, ESYCOM University Paris-EST, Cité Descartes, Noisy le Grand Cedex, France; A. BENDALI, M. DJILAS, E. DUBUS, J. DEGARDIN, S. PICAUD, INSERM, U968 Institut de la vision Paris, France; B. YVERT, CNRS, Institut des Maladies Neurodégénérative, UMR5293, Bordeaux, Talence, France
- 9.00 *FK-4:IL03* **Nanocrystalline Diamond for Micro-Electro-Mechanical Systems**
O.A. WILLIAMS, School of Physics and Astronomy, Cardiff University, Cardiff, UK
- 9.30 *FK-4:IL04* **High Electric Field Diamond Power Devices**
E. GHEERAERT, University of Grenoble-Alps, Grenoble, France
- 10.00 *FK-4:IL05* **Compact High Voltage Power Switches Based on PIN Diamond Diode Emitters**
D. TAKEUCHI, T. MAKINO, H. KATO, M. OGURA, H. OHASHI, H. OKUSHI, S. YAMASAKI, Energy Technology Research Institute, AIST, Japan; S. KOIZUMI, Wide Bandgap Materials Group, NIMS, Japan; all Advanced Low Carbon Society Technology Development Program (ALCA), JST c/o AIST, Japan, and Core Research for Evolutional Science and Technology (CREST), JST c/o AIST, Japan
- 10.30 *Break*

Chair: **P. BERGONZO**, France

- 11.00 *FK-4:IL06* **Squeezing Water between Graphene Sheets: Implications for Transport through Graphene Oxide Membranes**
HWAY CHUAN KANG, Department of Chemistry and Yale-NUS College, National University of Singapore, Singapore
- 11.30 *FK-4:IL07* **Graphene-based Nanosandwiches for Energy Storage and Conversion**
XINLIANG FENG, Max Planck Institute for Polymer Research, Mainz, Germany
- 12.00 *FK-4:IL08* **Graphene Applications in Sensors and Analog Devices**
A.A. BALANDIN, Nano-Device Laboratory, Department of Electrical Engineering and Materials Science and Engineering Program, Bourns College of Engineering, University of California - Riverside, Riverside, CA, USA

Session FM-1 - Resistance Switching Memories (ReRAM)

Room: **ALBA 2**

Chair: **S. SPIGA, Italy**

8.30 FM-1:IL01 Energy-efficiency in Redox-based Memristive Devices

R. WASER, V. RANA, ST. MENZEL, E. LINN, PGI-7 & JARA-FIT, Forschungszentrum Jülich, Jülich, and IWE2 & JARA-FIT, RWTH Aachen University, Aachen, Germany

9.00 FM-1:IL03 Resistive Switching in the Chalcogenide Compounds AM₄Q₈ (A= Ga, Ge; M=V, Nb, Ta, Mo; Q=S, Se, Te): Towards Mott Memories

E. JANOD, B. CORRAZE, J. TRANCHANT, M. QUERRÉ, P. STOLIAR, M.-P. BESLAND, L. CARIO, Institut des Matériaux Jean Rouxel, Université de Nantes - CNRS, Nantes Cedex, France; V. TAPHUOC, GREMAN, CNRS UMR 7347-CEA, Université F. Rabelais, UFR Sciences, Parc de Grandmont, Tours, France; M. ROZENBERG, Laboratoire de Physique des Solides, CNRS UMR 8502, Université Paris Sud, Orsay, France; V. DUBOST, T. CREN, D. RODITCHEV, Institut des Nanosciences de Paris, Université Pierre et Marie Curie, CNRS UMR 7588, Paris, France

9.30 FM-1:IL04 TMO-based Memristive Devices and Application for Neuromorphic Systems

JINFENG KANG, B. GAO, Y.J. BI, B. CHEN, X.Y. LIU, Peking University, Beijing, China; S.M. YU, Arizona State University, Tempe, AZ, USA; H-Y. CHEN, H.-S. PHILIP WONG, Stanford University, Stanford, CA, USA

10.00 Break

Session FM-4 - Memristive Materials, Devices and Emerging Applications

Room: **ALBA 2**

Chair: E. JANOD, France / R. WASER, Germany

- 10.30 *FM-4:IL01* **Phase-change Memories, Memristors and Memflectors**
C.D. WRIGHT, P. HOSSEINI, Department of Engineering, University of Exeter, Exeter, UK
- 11.00 *FM-4:L03* **Study of Memristive Switching Effects in MIM-stacks with the Graded Functional Layer**
Yu. MATVEYEV, YU. LEBEDINSKII, A. MARKEEV, K. EGOROV, Moscow Institute of Physics and Technology, Moscow Region, Russia; A. ZENKEVICH, National Research Center "Kurchatov Institute", Moscow, Russia
- 11.20 *FM-4:L04* **BiFeO₃ Bilayer Structures for Implementing beyond Von-Neumann Computing**
TIANGUI YOU, NAN DU, D. BÜRGER, I. SKORUPA, O.G. SCHMIDT, H. SCHMIDT, Material Systems for Nanoelectronics, Chemnitz University of Technology, Chemnitz, Germany; YAO SHUAI, WENBO LUO, State Key Laboratory of Electronic Thin Films and Integrated Devices, University of Electronic Science and Technology of China, Chengdu, China; S. HENKER, C. MAYR, R. SCHÜFFNY, Faculty of Electrical Engineering and Information Technology, Institute of Circuits and Systems, Technische Universität Dresden, Dresden, Germany; T. MIKOLAJICK, NaMLab gGmbH, Dresden, Germany
- 11.40 *FM-4:L05* **Amorphous In-Ga-Zn-O Thin-Film-Transistor Memory Devices for System-on-Panel Applications**
SHI-JIN DING, XING-MEI CUI, SUN CHEN, School of Microelectronics, Fudan University, Shanghai, China
- 12.00 *FM-4:IL06* **Memristor Memory: a Fundamentally New Opportunity**
J.H. NICKEL, J.J. YANG, J.P. STRACHAN, G. SNIDER, **R.S. WILLIAMS**, Hewlett Packard Laboratories, Palo Alto, CA, USA

Session FN-6 - Synthesis and Processing

Room: **TORRETTA (Hotel Tamerici)**

Chair: G. BOTTON, Canada

8.30 *FN-6:IL05* **Topological Electronic Structure and Properties of Single-layer Films for Spintronics Applications: Silicene and Related Materials**

HSIN LIN, Graphene Research Centre and Department of Physics, National University of Singapore, Singapore; **WEI-FENG TSAI**, **CHENG-YI HUANG**, **FENG-CHUAN CHUANG**, **ZHI-QUAN HUANG**, **CHIA-HSIU HSU**, **YU-TZU LIU**, **HUA-RONG CHANG**, Department of Physics, National Sun Yat-Sen University, Kaohsiung, Taiwan; **TAY-RONG CHANG**, **HORNG-TAY JENG**, Department of Physics, National Tsing Hua University, Hsinchu, Taiwan; **GAURAV GUPTA**, **MANSOOR BIN ABDUL JALIL**, **GENGCHIAU LIANG**, Department of Electrical and Computer Engineering, National University of Singapore, Singapore; **ARUN BANSIL**, Department of Physics, Northeastern University, Boston, MA, USA

9.00 *FN-6:IL06* **Single Crystal Growth of BaFe₂As₂-based Superconductors by Self-flux Method**

H. EISAKI, K. KIHOU, S. ISHIDA, M. NAKAJIMA, A. IYO, C.H. LEE, AIST, Tsukuba, Japan; T. SAITO, H. FUKAZAWA, Y. KOHORI, Chiba University, Japan; S. UCHIDA, Tokyo University, Japan

9.30 *FN-6:L07* **Optimally Processed MgB₂ Bulk Magnets with High Critical Currents**

M. MURALIDHAR¹, K. INOUE¹, M.R. KOBLISCHKA², M. MURAKAMI¹, ¹Superconducting Materials Laboratory, Department of Materials Science and Engineering, Shibaura Institute of Technology, Tokyo, Japan; ²Institute of Experimental Physics, Saarland University, Saarbrücken, Germany

9.50 *Break*

Session FN-7 - Applications

Chair: J.L. TALLON, New Zealand

10.20 *FN-7:IL02* **Modelling and Measurement of AC Loss in Coated Conductor Windings**

E. PARDO, J. SOUC, J. KOVAC, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia

10.50 *FN-7:IL04* **The Superconducting Order Parameter in Iron-based Superconductors**

T. SHIBAUCHI, Department of Advanced Materials Science, University of Tokyo, Chiba, Japan

11.20 *FN-7:IL05* **Low Loss Cable from High-temperature Superconducting Tapes**

F. GOMORY, J. SOUC, M. VOJENCIK, M. SOLOVYOV, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia

11.50 *FN-7:L06* **Light MgB₂ Superconductor with Ti-barrier and Al-stabilization Suitable for Mass-limited Applications**

P. KOVAC, I. HUŠEK, T. MELIŠEK, L. KOPERA, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia

Session FO-5 - Targeted Delivery, Controlled Release Systems and Nanotheranostics

Room: **SIRIO**

Chair: C.T. LAURENCIN, USA

- 8.30 *FO-5:IL01* **Reconstituted Stem Cell Nano-ghost: Nature Inspired Targeting Platform**
M. MACHLUF, Faculty of Biotechnology and Food Engineering, Technion-Israel Institute of Technology, Haifa, Israel
- 9.00 *FO-5:IL08* **Comparison of Intestinal Permeation Enhancers for Delivery of Poorly Absorbed Oral Drugs**
D.J. BRAYDEN, J. GLEESON, S. SLADEK, F. MCCARTNEY, School of Veterinary Medicine and UCD Conway Institute, University College Dublin, Ireland
- 9.30 *FO-5:IL09* **Designing Lipid-substituted Cationic Polymers for Gene Based Medicines**
H. ULUDAG, H.M. ALIABADI, L. ROSE, B. LANDRY, J. VALENCIA, REMANT K.C., Departments of Chemical & Materials, and Biomedical Engineering, University of Alberta, Canada
- 10.00 *FO-5:IL10* **Designing Cytocleavable Polyrotaxanes as a Vehicle for Molecular Logistics of Biomacromolecular Delivery into Target Cells**
N. YUI, A. TAMURA, J.-H. SEO, N. YOKOYAMA, G. IKEDA, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan
- 10.30 *Break*

Session FO-6 - Materials for Neural Interfaces and Implantable Neural Devices

Chair: M. ROMERO-ORTEGA, USA

- 11.00 *FO-6:IL01* **Neuron-electronic Hybrid Systems for Cultured Neurons: From Extracellular to In-cell Recordings by Electrode Engulfment or Cell Electroporation**
M.E. SPIRA, The A. Silberman Life Sciences Inst. & H. Kruger Nanoscience center, The Hebrew University of Jerusalem, Israel
- 11.30 *FO-6:IL02* **Nanowires: A Promising Tool for Neural Implant Applications**
C.N. PRINZ, Division of Solid State Physics, Nanometer Structure Consortium and Neuronano Research Center, Lund University, Lund, Sweden
- 12.00 *FO-6:IL03* **New Generation CNT-based Biochips for Interfacing the Central Nervous System**
L. BALLERINI, University of Trieste, Trieste, Italy
- 12.30 *FO-6:IL04* **High-density Implantable Microelectrode Arrays for Brain-machine Interface Applications**
B. GHANE-MOTLAGH, M. SAWAN, Polystim Neurotechnologies Laboratory, Department of Electrical Engineering, Polytechnique Montreal, Montreal (Quebec), Canada

Session FO-8.5 - Smart, Swollen Systems for Biomedical Applications

Room: **GIOVE**

Chair: **N. TIRELLI, UK**

- 11.30 *FO-8.5:IL01* **Self-oscillating Gel as Novel Biomimetic Materials**
R. YOSHIDA, Department of Materials Engineering, School of Engineering, The University of Tokyo, Japan
- 12.00 *FO-8.5:IL02* **Functional Thermoresponsive Nanogels for Biomedical Applications**
M. CALDERON, Institute of Chemistry and Biochemistry, Freie Universität Berlin, Berlin, Germany
- 12.30 *FO-8.5:L04* **Multi-functional Flexible Devices Based on PEDOT-PSS- ionic Liquid**
H. RANDRIAMAHAZAKA¹, H. OKUZAKI², ¹Université Paris Diderot, Sorbonne Paris Cité, ITODYS, UMR 7086 CNRS, Paris Cedex, France; ²University of Yamanashi, Kofu, Japan

Session FO-9.4 - Energy Harvesting and Management

Room: **BUENO (Hotel Croce di Malta)**

Chair: J. LUPRANO, Switzerland

- 9.00 *FO-9.4:IL02* **Tailoring the Electrical and Optical Properties of Graphene for Energy Harvesting**
M. CRACIUN, Centre for Graphene Science, University of Exeter, Exeter, UK
- 9.30 *FO-9.4:IL03* **Power Management for Vibrational Energy Harvesters**
S. STANZIONE, C. VAN LIEMPD, IMEC-NL, Eindhoven, The Netherlands; C. VAN HOOFF, IMEC-NL, The Netherlands, and KU Leuven, Belgium
- 10.00 *FO-9.4:L04* **Hybrid Energy Harvesting using Electroactive Polymers Combined with Piezoelectric Materials**
A. CORNOGOLUB, L. PETIT, P.-J. COTTINET, INSA de Lyon, LGEF, Villeurbanne, France
- 10.20 *Break*

Session FO-9.5 - Antennas, Data Transmission, Signal Processing

Chair: D. DE ROSSI, Italy

- 10.50 *FO-9.5:IL02* **Combination of Body Sensor Networks and On-body Signal Processing Algorithms**
J. LUPRANO, CSEM SA, Neuchâtel, Switzerland
- 11.20 *FO-9.5:IL04* **Signal Processing for Ultra Low Power Communications: Capsule Endoscope**
I. BALASINGHAM, Oslo University Hospital & Norwegian University of Science and Technology, Oslo, Norway

Session FO-9.2 - Smart Fabrics and Wearables

- 11.50 *FO-9.2:IL01* **Tools for Care of Elderly People**
T. TAMURA, Department of Biomedical Engineering, Osaka Electro-communication University, Neyagawa, Osaka, Japan

Special Session FA-4 - DURAMET Workshop on Direct Alcohol Fuel Cells (DAFCs)

Room: **AUDITORIUM**

Chair: A. ARICO', Italy

- 15.00 *FA-4:IL12* **Degradation of Direct Methanol Fuel Cell: Analysis of Temporary and Permanent Phenomena and their Effects on Components**
A. CASALEGNO, F. BRESCIANI, M. ZAGO, R. MARCHESI, Department of Energy, Politecnico di Milano, Italy
- 15.30 *FA-4:L13* **The Use of Different Types of Reduced Graphene Oxide (rGO) on the Reduction Oxygen Reaction (ORR) under Alkaline Conditions**
A.H.A. MONTEVERDE VIDELA, **L. OSMIERI**, S. SPECCHIA, Politecnico di Torino, Department of Applied Science and Technology, Torino, Italy
- 15.50 *FA-4:L15* **Composite Anode Catalysts based on PtRu and Metal Oxides for DMFCs**
D. SEBASTIAN, V. BAGLIO, C. D'URSO, A. STASSI, A.S. ARICO', CNR-ITAE, Messina, Italy
- 16.10 *FA-4:L16* **Pd-based Electrocatalysts as Cost-effective Cathodes for Direct Methanol Fuel Cells**
V. BAGLIO, C. D'URSO, D. SEBASTIÁN, A. STASSI, A.S. ARICO', CNR-ITAE, Messina, Italy

Sub-Session FB-2.5 - Theoretical Modelling, New Characterization Methods and Storage Testing

Room: **LE PLEIADI**

Chair: **A. MONTONE**, Italy

- 15.00 *FB-2.5:IL06* **Nanomaterials for Hydrogen Storage**
P. JENA, Virginia Commonwealth University, Richmond, VA, USA
- 15.30 *FB-2.5:L08* **Computational Search for Improved Ammonia Storage Materials**
P.B. JENSEN, S. LYSGAARD, T. VEGGE, DTU Energy Conversion, Technical University of Denmark, Kgs. Lyngby, Denmark; U. QUADE, Amminex Emissions Technology, Soeborg, Denmark
- 15.50 *FB-2.5:L09* **Novel FIB-SEM Methodologies for 3D Nanostructuring and Nanoanalysis of Hydrogen Storage Materials**
M. SEZEN¹, F. BAKAN¹, M.A. GULGUN², E. RABKIN³, ¹Sabanci University Nanotechnology Research and Application Center, Orhanli-Tuzla, Istanbul, Turkey; ²Sabanci University; Faculty of Engineering and Natural Sciences; Orhanli-Tuzla, Istanbul, Turkey; ³Department of Materials Science and Engineering, Technion, Haifa, Israel
- 16.10 *FB-2.5:L10* **Thin Film Based Fiber Optic Hydrogen Sensor for Continuously Monitoring the Health Status of Power Transformers**
M. VICTORIA, R.J. WESTERWAAL, T. MAK, H. SCHREUDERS, C. BOELSMA, B. DAM, Materials for Energy Conversion and Storage (MECS), Faculty of Applied Sciences, Dept. Chemical Engineering, Delft University of Technology, Delft, The Netherlands

Session FC-2 - Supercapacitors

Room: **VENERE**

Chair: **A. MANTHIRAM, USA**

- 15.00 *FC-2:IL09* **Improving the Energy Density of Electrochemical Capacitors: From Pseudocapative Electrodes to Hybrid Devices**
T. BROUSSE, Institut des Matériaux Jean Rouxel, IMN, UMR-CNRS 6502, Université de Nantes, Réseau RS2E France, Polytech Nantes, Nantes Cedex, France
- 15.30 *FC-2:IL10* **Economic and Ecological Life Cycle Assessment of New Materials for Supercapacitors and Batteries**
M. WEIL^{1, 2}, H. DURA¹, M. BAUMANN¹, B. ZIMMERMANN¹, B. SIMON², S. ZIEMANN¹, G.R. GARCIA², ¹Institute for Technology Assessment and System Analysis (ITAS), Karlsruhe Institute of Technology (KIT), Germany; ²Helmholtz Institute Ulm for Electrochemical Energy Storage (HIU), Karlsruhe Institute of Technology (KIT), Germany
- 16.00 *FC-2:L12* **Hybrids of 2D-nanomaterials for Supercapacitors/Battery Applications**
B. MENDOZA SANCHEZ, J. COELHO, S. O'BRIEN, H. PETTERSSON, V. NICOLSI, CRANN, Trinity College Dublin, Dublin, Republic of Ireland

Session FE-3 - Design Approaches for Advanced Applications

Room: **ORSA MAGGIORE**

Chair: G. CENTI, Italy

15.00 FE-3:IL12 The Photocatalytic Properties of Gypsum Plaster Containing Co-modified TiO₂-N,C and its Application in Synthetic Dye Removal

M. JANUS¹, E. KUSIAK-NEJMAN², K. BUBACZ², A. CZYZEWSKI², J. ZATORSKA², **A.W. MORAWSKI²**, ¹West Pomerania University of Technology, Department of Sanitary Engineering, Szczecin, Poland; ²West Pomerania University of Technology, Szczecin, Institute of Chemical and Environmental Engineering, Szczecin, Poland

15.30 FE-3:IL14 Photocatalytic Materials Based on F-doped or co-doped TiO₂

M.V. DOZZI, **E. SELLI**, Department of Chemistry, University of Milan, Milano, Italy; B. OHTANI, Catalysis Research Center, Hokkaido University, Sapporo, Japan

Session FI-3 - Device Structures and Manufacturing

Room: **ZENITH**

Chair: G. RIGHINI, Italy

- 15.00 *FI-3:IL05* **White LEDs on Flexible Substrates**
M. WILLANDER, Dept. of Science and Technology, Linköping University, Norrköping, Sweden
- 15.30 *FI-3:IL07* **Quantum Dots Based on Nitrides Candidates for Single Photon Sources and Light Emitting Devices**
A. HOFFMANN, Technical University of Berlin, Institute of Solid State Physics, Berlin, Germany
- 16.00 *FI-3:L08* **Laser Diode Arrays as a Source of Solid State Lighting**
M. LESZCZYNSKI, P. PERLIN, R. CZERNECKI, E. GRZANKA, S. GRZANKA, A. KAFAR, G. TARGOWSKI, M. SARZYNSKI, T. SUSKI, Institute of High Pressure Physics UNIPRESS and TopGaN, Warsaw, Poland

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

Room: **GUTTUSO (Hotel Croce di Malta)**

Chair: HUA-TAY LIN, USA

- 15.00 *FJ-8:IL01* **Steels for Fission and Fusion Applications**
J.-L. BOUTARD, Cabinet du Haut-Commissaire à l'Energie Atomique, Gif sur Yvette Cedex, France
- 15.30 *FJ-8:IL02* **Low Activation Structural Materials for Fission and Fusion Power Reactors**
V.M. CHERNOV, M.V.LEONTIEVA-SMIRNOVA, M.M. POTAPENKO, V.A. DROBYSHEV, D.A. BLOKHIN, JSC "A.A.Bochvar High-technology Research Institute of Inorganic Materials", Moscow, Russia; A.N.TYUMENTSEV, Tomsk State University, Tomsk, Russia; A.I. BLOKHIN, N.I. LOGINOV, A.I. LEYPUNSKY, Institute of Physics and Power Engineering, Obninsk, Russia
- 16.00 *FJ-8:IL03* **Development of Silicide Coatings on Vanadium Alloys**
S. MATHIEU, N. CHAIA, M. VILASI, IJL-Université de Lorraine, Vandoeuvre lès Nancy, France; F. ROUILLARD, J.L. COUROUAU, LECNA, CEA Saclay, France

Session FJ-10.3 - Waste Form Modeling, Performance Testing, and Advanced Characterization Techniques

Room: **BARZAGLI (Hotel Croce di Malta)**

Chair: K. FOX, USA

- 15.00 *FJ-10.3:IL01* **Development and Characterization of Radiation Resistant Waste Glass for Immobilization of Radionuclides**
S. PEUGET, J.M. DELAYE, E.A. MAUGERI, C. MENDOZA, A.H. MIR, R. CARABALLO, M. TRIBET, O. BOUTY, C. JÉGOU, CEA, DEN, Laboratoire d'Étude des Matériaux et Procédés Actif, Bagnols-sur-Ceze, France
- 15.30 *FJ-10.3:IL02* **Experimental, Simulation, and Natural Analogue Studies of Nuclear Wasteform Materials**
G.R. LUMPKIN, E.Y. KUO, S.C. MIDDLEBURGH, M.J. QIN, G.J. THOROGOOD, Y. ZHANG, Z. ZHANG, D.J. GREGG, ANSTO, Kirrawee DC, NSW, Australia; M. ROBINSON, N.A. MARKS, Nanochemistry Research Institute, Curtin University, Perth, WA, Australia
- 16.00 *FJ-10.3:IL03* **The Belgian Approach Towards the Investigation of the Compatibility with Geological Disposal of Eurobitum Bituminized Intermediate Level Radioactive Waste**
E. VALCKE¹, N. BLEYEN¹, S. SMETS¹, M. VASILE¹, X. SILLEN², ¹W&D Expert Group, SCK.CEN, Mol, Belgium; ²ONDRAF/NIRAS, Brussels, Belgium
- 16.30 *FJ-10.3:IL04* **New Insight into Nuclear and Natural Glasses Dissolution Mechanisms Controlling Long-term Rate**
S. GIN, Marcoule DTCD/SECM, Bagnols sur Ceze, France

Session FK-4 - Applications

Room: **URANO**

Chair: **Y. GOGOTSI, USA**

- 15.00 *FK-4:IL09* **Technology of Field Emitters Based on Carbon Nanotubes**
M.L. TERRANOVA, Dip. di Scienze e Tecnologie Chimiche, MINIMA-lab, University of Roma Tor Vergata, Roma, Italy; and NANOSHARE Srl
- 15.30 *FK-4:IL10* **Electrochemical Behavior of Carbon Nanofibers and Related Materials**
V. PRESSER, D. WEINGARTH, J.S. ATCHISON, M. ASLAN, INM - Leibniz Institute for New Materials & Saarland University, Saarbrücken, Germany
- 16.00 *FK-4:IL12* **Catalytic Application of Nanoporous Carbon Materials**
B. HASSE, J. GLÄSEL, F. REISSNER, P. HAUSMANN, C. DICENTA, **B.J.M. ETZOLD**, Lehrstuhl für Chemische Reaktionstechnik, Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany

Session FM-4 - Memristive Materials, Devices and Emerging Applications

Room: **ALBA 2**

Chair: S. SPIGA, Italy

- 15.00 *FM-4:IL07* **Nanodevices for Bio-inspired Computing: Memristors & More**
J. GROLLIER *et al*, CNRS/Thales, Palaiseau, France
- 15.30 *FM-4:IL08* **Tunnel Junction Based Memristors for Neuromorphic Processing**
A. THOMAS, Bielefeld University and Mainz University, Germany
- 16.00 *FM-4:IL09* **Neuromorphic Computing with Memristive Circuits**
D.B. STRUKOV, Electrical and Computer Engineering Department, University of California at Santa Barbara, Santa Barbara, CA, USA

Session FM-3 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

- 16.30 *FM-3:IL01* **Current Status and Prospects of Magnetoresistive Random Access Memory Technology**
H. OHNO, Center for Spintronics Integrated Systems, Tohoku University, Japan, Laboratory for Nanoelectronics and Spintronics Research Institute of Electrical Communication, Tohoku University, Japan, WPI-Advanced Institute for Materials Research, Tohoku University, Japan

Session FN-7 - Applications

Room: **TORRETTA (Hotel Tamerici)**

Chair: D. PAVUNA, Switzerland

- 15.00 *FN-7:IL08* **Development of Roebel Cables for High Current Applications**
W. GOLDACKER, A. KARIO, A. KLING, Karlsruhe Institute of Technology, Institute for Technical Physics, Eggenstein, Germany
- 15.30 *FN-7:IL09* **Physics and Applications of High-Tc Superconductors**
J.L. TALLON, MacDiarmid Institute & Callaghan Innovation, Lower Hutt, New Zealand
- 16.00 *FN-7:IL11* **Recent Progress in Terahertz Emission and Detection of High Temperature Superconducting $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$**
L. OZYUZER, Y. DEMIRHAN, F. TURKOGLU, H. KOSEOGLU, H. ALABOZ, M. KURT, Department of Physics, Izmir Institute of Technology, Izmir, Turkey; K. KADOWAKI, University of Tsukuba, Tsukuba, Japan

Session FO-6 - Materials for Neural Interfaces and Implantable Neural Devices

Room: **SIRIO**

Chair: A.R. BOCCACCINI, Germany

- 15.00 *FO-6:IL05* **Regenerative Peripheral Nerve Interfacing of Smart Prosthetics**
M. ROMERO-ORTEGA, University of Texas at Arlington, Arlington, TX, USA
- 15.30 *FO-6:IL06* **Molecular Self-assembly of Peptide/Neural Cells Biointerfaces**
S. YITZCHAIK, Institute of Chemistry, and the Center for Nanoscience and Nanotechnology, The Hebrew University of Jerusalem, Jerusalem, Israel
- 16.00 *FO-6:IL07* **Flexible Optical and Electronic Platforms for Neural Recording, Interrogation and Repair**
A. CANALES¹, XIAOTING JIA², A. LU¹, U. FRORIEP², **P. ANIKEEVA**^{1, 2}, ¹Department of Materials Science and Engineering, ²Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA, USA

Session FO-8.6 - Smart Polymers in Biomedical Applications

Room: **GIOVE**

Chair: A. LENDLEIN, Germany

- 15.00 *FO-8.6:IL03* **Reactions at the Interface of Droplets: A Molecular “Screw Clamp” for the Formation of Smart Nanocapsules for Biomedical Applications**
K. LANDFESTER, **F.R. WURM**, Max Planck Institute for Polymer Research, Mainz, Germany
- 15.30 *FO-8.6:IL01* **Responsive Nanomaterials and Anti-inflammatory Therapies**
N. TIRELLI, School of Medicine/Institute of Inflammation and Repair, and School of Materials. University of Manchester, Stopford building, Manchester, UK
- 16.00 *FO-8.6:IL04* **Chemical Cross-linking and Mechanical Properties of Thermosensitive Tissue Adhesive Hydrogels**
D.G. BARRETT, G. BUSHNELL, **P.B. MESSERSMITH**, Northwestern University, Evanston, IL, USA

POSTER PRESENTATIONS

POSTER DISCUSSION

THURSDAY JUNE 19: 16.30 - 18.30

Posters desmounting:

Please desmount your poster soon after the
Poster Discussion Session

SYMPOSIUM FA

FUEL CELLS: MATERIALS AND TECHNOLOGY CHALLENGES

FA:P02 Spin-coated La_{0.8}Sr_{0.2}Ga_{0.8}Mg_{0.2}O₃ Electrolyte on Infiltrated anodes for Biogas Utilization

Z. SALEHI¹, I. LUISETTO², F. BASOLI¹, A. D'EPIFANIO¹, S. LICOCCHIA¹, S. TUTI², E. DI BARTOLOMEO¹, ¹Department of Chemical Science and Technology and NAST Center, University of Rome Tor Vergata, Rome, Italy; ²Department of Science, University of Rome "Roma Tre", Rome, Italy

FA:P03 Copper Doped Lanthanum Strontium Ferrite as Cathode for La_{0.8}Sr_{0.2}Ga_{0.8}Mg_{0.2}O₃

F. ZURLO¹, E. DI BARTOLOMEO¹, A. D'EPIFANIO¹, V. FELICE², I. NATALI SORA², S. LICOCCHIA¹, ¹Department of Chemical Science and Technologies & NAST Center University of Rome "Tor Vergata", Italy; ²INSTM R.U. and Department of Engineering, University of Bergamo, Dalmine, BG, Italy

FA:P04 Biogas Reforming for Hydrogen Production for SOFCs Applications: Performance of Ni/La-C-O Catalysts

L. PINO, A. VITA, M. LAGANÀ, V. RECUPERO, CNR Institute of Advanced Technology for Energy "Nicola Giordano", Messina, Italy

FA:P05 Porous/Dense YSZ Layers for Prospective SOFC Processing

N. VITORINO¹, C. FREITAS², J.C.C. ABRANTES^{1,2}, J.R. FRADE¹, ¹DeMAC, CICECO, University of Aveiro, Aveiro, Portugal; ²UIDM, ESTG, Polytechnic Institute of Viana do Castelo, Viana do Castelo, Portugal

FA:P06 Synthesis, Properties and Phase Transitions of Pyrochlore- and Fluorite-like Ln₂RMo₇ (Ln=Sm, Ho; R=Lu, Sc; M= Nb, Ta)

A.V. SHLYAKHTINA, K.S. PIGALSKIY, I.V. KOLBANEV, Semenov Institute of Chemical Physics, Russian Academy of Sciences, Moscow, Russia; D.A. BELOV, Faculty of Chemistry, Moscow State University, Moscow, Russia; A.N. SHCHEGOLIKHIN, O.K. KARYAGINA, Emmanuel Institute of Biochemical Physics, Russian Academy of Sciences, Moscow, Russia

FA:P10 Synthesis, Crystalline Structure and Conductivity of Solid Solutions in Sr-Me-Ni-O (Me = Nd, Ti, Mo) System

V.V. PANKOV, L.V. MAKHNACH, L.A. LOMONOSOV, E.S. KRAVCHENKO, Belarusian State University, Minsk, Belarus

FA:P12 Polarization Studies of a Novel Fe/ BaCe_{0.5}Zr_{0.3}Y_{0.08}Yb_{0.08}Cu_{0.04}O_{3-δ} /Fe Proton Conducting Solid Electrolyte at Intermediate Temperatures

S. MITRI¹, D. MEDVEDEV², A. DEMIN², P. TSIKARAS¹, ¹Department of Mechanical Engineering, School of Engineering, University of Thessaly, Pedion Areos, Volos, Greece; ²Institute of High Temperature Electrochemistry, Yekaterinburg, Russia

FA:P14 Electrical and Electrochemical Properties of La_{2-x}CaxNiO₄ and La_{2-x}CaxNiO₄-Ce_{0.8}Sm_{0.2}O_{1.9} as Cathode Materials for Intermediate Temperature SOFCs

E.Yu. PIKALOVA¹, A.A. KOLCHUGIN^{1,2}, N.M. BOGDANOVICH¹, D.I. BRONIN¹, ¹Institute of High Temperature Electrochemistry, UB RAS, Yekaterinburg, Russia; ²Vitus Bering Kamchatka State University, Petropavlovsk-Kamchatskiy, Russia

FA:P15 Carbon Nanotubes Supported Iron Phthalocyanine- and Based Polyindole-based Electrocatalysts for Oxygen Reduction in DMFCs

M.T. NGUYEN, A. D'EPIFANIO, B. MECHERI, **A. IANNACI**, S. LICOCIA, Dept. Chemical Science and Technology & NAST Center, University of Rome Tor Vergata, Italy

FA:P16 SPEEK / Functionalized Titanium Oxide Nanocomposite Proton Exchange Membranes

C. DE BONIS¹, A. D'EPIFANIO¹, B. MECHERI¹, D. COZZI¹, I. NICOTERA², S. LICOCIA¹, ¹University of Rome Tor Vergata, Rome, Italy; ²Department of Chemistry and Chemical Technologies, University of Calabria, Rende (CS), Italy

FA:P17 Hydrogen Electrooxidation on PdM (M= Rh, Sn, Ru) Electrocatalysts for PEM Fuel Cells

F. TZORBATZOGLU, A. BROUZGOU, P. TSIKARAS, Department of Mechanical Engineering, School of Engineering, University of Thessaly, Volos, Greece

FA:P18 Anionic Exchange Membranes for Fuel Cells Applications

L. PASQUINI^{1,2}, R. NARDUCCI^{1,2}, P. KNAUTH¹, M.L. DI VONA², ¹Aix Marseille Univ., UMR 7246, Marseille, France; ²Univ. Roma Tor Vergata, Roma, Italy

FA:P20 Glucose Electrooxidation in Alkaline Media for Fuel Cell Applications: A comparative Study of PdM/C (M=Au, Sn, Rh) Based Electrocatalysts

A. BROUZGOU, F. TZORBATZOGLU, P. TSIKARAS, Department of Mechanical Engineering, School of Engineering, University of Thessaly, Volos, Greece

FA:P21 Development of a Subscale Hydrogen Generator Unit for SOFC as APU for Naval Applications

V. RECUPERO, L. PINO, A. VITA, C. ITALIANO, M. LAGANÀ, CNR Institute of advanced Technology for Energy "Nicola Giordano", Messina, Italy

FA:P22 Ab-initio Simulation of Beta-Ta₂O₅ as a Catalyst for Oxygen Reduction Reaction

M.F. SGROI, **V. DELLACÀ**, Group Materials Labs, Centro Ricerche FIAT, Orbassano (TO), Italy

FA:P23 Nobel-metal-free Anode Catalysts for Direct Methanol Fuel Cells

XIAODONG WANG, P. MADKIKAR, T. MITTERMEIER, M. PIANA, H.A. GASTEIGER, Institute of Technical Electrochemistry, Technical University of Munich, Garching, Germany

FA:HP24 Multiblock Copolymers with Locally High Ionic Concentration for Anion Exchange Membranes

E.A. WEIBER, DAVID MEIS, PATRIC JANNASCH, Lund University, Department of Chemistry, Lund, Sweden

SYMPOSIUM FB

HYDROGEN PRODUCTION AND STORAGE

FB:P01 The Effect of Doping of Fe into TiO₂ Layer in Fe₂O₃/TiO₂/FTO System for High Performance of Water Splitting

A. AZAD¹, EUL NOH¹, HYO JIN OH¹, BO RA KIM¹, KANG SEOP YUN¹, HEE JUNE JEONG¹, WOO SEUNG KANG², SANG CHUL JUNG³, SUN JAE KIM¹,
¹Institute/Faculty of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, Korea; ²Dept. of Metallurgical & Materials Engineering, Inha Technical College, Incheon, Korea; ³Dept. of Environmental Engineering, Sunchon National University, Suncheon, Jeonnam, Korea

FB:P02 Synthesis of Macroporous Materials as the Immobilizing Agent for Photosynthetic Bacteria in Photobiological Hydrogen Generation

K. DYBA, R. ZAGRODNIK, Faculty of Chemistry, A. Mickiewicz University, Poznan, Poland

FB:P03 Optimization of Hydrogen Production by Co-culture of Clostridium Beijerinckii and Rhodobacter Sphaeroides Bacteria

R. ZAGRODNIK, Faculty of Chemistry, Adam Mickiewicz University, Poznan, Poland

FB:P04 The Effect of Gas Compositions on the Performance and Durability of SOECs

SUN-DONG KIM, DOO-WON SEO, JI-HAENG YU, SANG-KUK WOO, Korea Institute of Energy Research, Daejeon, Korea

FB:P05 Distillery Waste Waters in Photofermentative Hydrogen Generation

K. SEIFERT, R. ZAGRODNIK, M. STODOLNY, K. DYBA, M. LANIECKI, Faculty of Chemistry, A. Mickiewicz University, Poznan, Poland

FB:P06 Performance Assessment of Solid Oxide Cells under High Steam Content Electrolysis

N.P. KOTSIANOPOULOS, G. DE MARCO, T. MALKOW, G. TSOTRIDIS, European Commission, Directorate-General Joint Research Centre, Institute for Energy and Transport, Petten, The Netherlands

FB:P07 Application of Liquid Wastes from Sugar Industry in Photofermentative Method of Hydrogen Generation

K. SEIFERT, R. ZAGRODNIK, M. STODOLNY, **M. LANIECKI**, Faculty of Chemistry, A. Mickiewicz University, Poznan, Poland

FB:P08 Plasma Chemical Reactor for Hydrogen Production

G. PETRACONI, Technological Institute of Aeronautics, Sao José dos Campos, SP, Brazil; **A.M. ESSIPTCHOUK**, Luikov Heat- and Mass Transfer Institute, Minsk, Belarus

FB:P09 Hydrogen Production from Wind Power in Algeria

L. AICHE-HAMANE, Department of mechanics, Faculty of technology, University Saad Dahlab Blida, Algeria; M. HAMANE, Centre for Development of Renewable Energies (CDER), Algiers, Algeria; B. BENYOUCEF, Research Unit for Materials and Renewable Energies (URMER), University Aboubakr Belkaid Tlemcen, Algeria

FB:P11 Hydrogen Sorption Cycling Behaviour of MgH₂ Powders and Pellets

G. DI GIROLAMO, D. MIRABILE GATTIA, **A. MONTONE**, ENEA, Materials Technology Unit, Casaccia Research Centre, Rome, Italy

FB:P14 Hydrogen Technologies and Applications: Safety

M. LLORCA, P. RUIZ, L.F. VEGA, MATGAS Research Center, Campus de la UAB, Bellaterra, Barcelona, Spain

FB:HP15 Atomistic Models of Long-term Hydrogen Diffusion in Metals

M.P. ARIZA¹, K.G. WANG², M. ORTIZ³, ¹Escuela Técnica Superior de Ingeniería, Universidad de Sevilla, Sevilla, Spain; ²Aerospace and Ocean Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA; ³Division of Engineering and Applied Science, California Institute of Technology, Pasadena, CA, USA

FB:HP16 Effect of Pulverization of Hydrogen Storage Alloys on Micro-scale Structural Changes in the Packed Bed

M. OKUMURA, Y. SAITO, Y. MATSUSHITA, H. AOKI, Tohoku University, Japan; Y. KAWAKAMI, Takasago Thermal Engineering Co., Ltd., Japan; K. TAKI, Nihon Visual Science, Inc., Japan

FB:HP17 A Millimeter Scale Reactor Integrated PEM Fuel Cell Energy System with an On-board Hydrogen Production, Storage and Regulation Unit for Autonomous Small Scale Applications

A. BALAKRISHNAN, C. MUELLER, H. REINECKE, Laboratory for Process Technology, IMTEK-Department of Microsystems Engineering, University of Freiburg, Freiburg, Germany

SYMPOSIUM FC

ELECTROCHEMICAL ENERGY STORAGE SYSTEMS: THE NEXT EVOLUTION

FC:P01 Production of Electrolyte Membranes for Sodium-beta Alumina Batteries

E. MERCADELLI, P. PINASCO, A. SANSON, CNR-ISTEC, Faenza, Italy

FC:P02 Electrochemical Deposition of Ir Catalyst on Carbon Fiber for the Vanadium Air Redox Flow Battery

T. DI NARDO, **C. NUNES KIRCHNER**, J. GROSSE AUSTING, O. OOSTERS, L. KOMSIYSKA, NEXT ENERGY . EWE Research Centre for Energy Technology at the University of Oldenburg, Oldenburg, Germany

FC:P03 Synthesis and Properties of LiFePO₄/C Cathode Materials prepared from Iron Phosphate Modified by V₂O₅

MOBINUL ISLAM², MAN-SOON YOON¹, **SOON-CHUL UR**¹, ¹Department of Materials Science and Engineering/Research Center for Sustainable Eco-Devices and Materials (ReSEM), Korea National University of Transportation, Chungju, Chungbuk, Republic of Korea; ²Green City Technology Institute, Korea Institute of Science and Technology (KIST), Seoul, Republic of Korea

FC:P04 Detecting Aging Phenomena in Electrochemical Storage Devices using High Resolution Computed Tomography

L. KOMSIYSKA, M. LEWERENZ, S. GARNICA, D. LEDWOCH, H. SEEBA, O. OOSTERS, NEXT ENERGY . EWE Research Centre for Energy Technology at the University of Oldenburg, Oldenburg, Germany

FC:P05 Effect of Process Parameters on the Silicon Nanoparticles Synthesized by Inductive Coupled Plasma

JOON-SOO KIM, BO-YUN JANG, JIN-SEOK LEE, Korea Institute of Energy Research, Daejeon, Korea

FC:P06 Synthesis and Behaviour of Conductive Polymer-V₂O₅ based Core Shell Particles for Application as Cathode Material in Lithium Ion Batteries

L. KOMSIYSKA, D. LEDWOCH, E. HAMMER, K. REINKEN, **O. OOSTERS**, NEXT ENERGY . EWE Research Centre for Energy Technology at the University of Oldenburg, Oldenburg, Germany

FC:P07 A Study on the Electrochemical Properties for Idiomorphic Crystals of Spinel-type Li⁺-conductive Oxides

S. KOMINE¹, Y. SATO¹, S. SUZUKI¹, K. KAMI¹, N. ZETTSU^{2,3}, K. TESHIMA^{2,3}, ¹DENSO CORPORATION, Agui-cho, Chita-gun, Aichi, Japan; ²Shinshu University, Nagano, Japan; ³CREST, Japan Society and Technological Agency

FC:P13 Electrochemical Performance of Magnetic Nanoparticles Encapsulated in Hollow Carbon Nanofibers

M.C. GIMENEZ-LOPEZ, C. HERREROS LUCAS, A.N. KHLOBYSTOV, School of Chemistry, Nottingham University, University Park Nottingham, UK

FC:P14 Direct Growth of Polyaniline Chains from Nitrogen Site of N-doped Carbon Nanotubes for High Performance Supercapacitor
JOONWON LIM, HAQ UL ATTA, SANG OUK KIM, Korea Advanced Institute of Science and Technology, Daejeon, South Korea

FC:P15 Polybithiophene/MnO₂ as New Electrode Material for Supercapacitor

A. BAHLOUL^{1,2}, B. NESSARK¹, E. BRIOT², H. GROULT², A. MAUGER³, K. ZAGHIB⁴, C.M. JULIEN², ¹Université Ferhat Abbas, Laboratoire d'Electrochimie et Matériaux, Sétif, Algeria; ²Université Pierre et Marie Curie, PECSA, UMR 7195, Bat. F, Paris, France; ³Université Pierre et Marie Curie, IMPMC, Paris, France; ⁴Energy Storage and Conversion, Research Institute of Hydro-Québec, Varennes, Québec, Canada

FC:P17 Ruthenium Oxide Nanoplates and Their High Performance in Lithium Ion Batteries

A. NAVULLA, G. STEVENS, **L. MEDA**, Department of Chemistry, Xavier University of Louisiana, New Orleans, LA, USA

SYMPOSIUM FD

ADVANCES IN MATERIALS AND TECHNOLOGIES FOR EFFICIENT DIRECT THERMAL-TO-ELECTRICAL ENERGY CONVERSION

FD:P01 Theoretical Study of Layered Oxychalcogenides as Thermoelectric Materials

H. FUNASHIMA, H. KATAYAMA-YOSHIDA, Department of Materials Engineering Science Graduate School of Engineering Science, Osaka University, Osaka, Japan

FD:P02 Solid-State Synthesis and Thermoelectric Properties of Mg₂+xSi_{0.7}Sn_{0.3}Sbm

SIN-WOOK YOU, **IL-HO KIM**, Department of Materials Science and Engineering, Korea National University of Transportation, Chungju, Chungbuk, Korea

FD:P03 First Principles Studies for Thermoelectric Properties of TAGS

H. SHINYA, H. FUNASHIMA, A. MASAGO, T. FUKUSHIMA, H. KATAYAMA-YOSHIDA, Graduate School of Engineering Science, Osaka University, Osaka, Japan

FD:P05 Electronic Structure and Thermoelectric Performance of Ternary Yb-Mg-Si Phases

M. KUBOUCHI, K. HAYASHI, Y. MIYAZAKI, Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan

FD:HP06 Capacitive Energy Harvesting System for Low-grade Heat

WEIYI LU, **YU QIAO**, University of California, San Diego, La Jolla, CA, USA; HYUCK LIM, Applied Materials, Inc.

FD:HP07 Influence of Gamma Irradiation on Properties of Selected Thermoelectric Materials

K. WOJCIECHOWSKI¹, M. ANDRZEJEWSKA¹, K. PYTEL², T. KROK², M. DOROSZ², J. MIETELSKI³, W. GIESZCZYK³, R. KOPEC³, M. BROZEK³, ¹Thermoelectric Research Laboratory, Faculty of Materials Science and Ceramics, AGH University of Science and Technology, Poland; ²National Centre for Nuclear Research, Poland; ³Nuclear Physical Chemistry Department, Institute of Nuclear Physics, Polish Academy of Sciences, Poland

FD:HP08 Fabrication and Thermoelectric Properties of Te Substituted BiCuSeO

T. SATO, Graduate School, Kogakuin University, Hachioji, Tokyo, Japan; H. KOHRI, T. YAGASAKI, Faculty of Engineering, Kogakuin University, Japan

SYMPOSIUM FE

ADVANCES IN PHOTOCATALYTIC MATERIALS FOR ENERGY AND ENVIRONMENTAL SUSTAINABILITY

FE:P02 **Hydrothermal Synthesis and Photocatalytic Properties of Pyrochlore Sm₂Zr₂O₇ Nanoparticles**

HAIBO JIN, JINGBO LI, PENGWAN CHEN; WENBIN CAO, School of Materials Science and Engineering, Beijing Institute of Technology; School of Materials Science and Engineering, University of Science & Technology Beijing, China

FE:P04 **AAO as the Support for Titania Photocatalysts**

M. STODOLNY, K. DYBA, M. LANIECKI, Faculty of Chemistry, A. Mickiewicz University, Poznan, Poland

FE:P08 **Influence of SiO₂ Thin Films on Optical Properties and Conversion Efficiency of ITO Based Thin Films for Photovoltaic Applications**

JONG SU WOO, **GUN EIK JANG**, Department of Materials Engineering, Chungbuk National University, Cheongju, Korea

FE:P09 **16c Substituted CsTaWO₆: The Influence of Different d0 Metal-Ions on the Photocatalytic Activity of Mixed Oxides with the Defect-Pyrochlore Structure**

L. SCHWERTMANN¹, R. MARSCHALL², M. WARK³, ¹Laboratory of Industrial Chemistry, Ruhr-University Bochum, Bochum, Germany; ²Justus-Liebig-University Giessen, Giessen, Germany; ³Institute for Chemistry, Carl von Ossietzky University Oldenburg, Oldenburg, Germany

FE:P12 **Mechanism of Li-storage in TiO₂ (B) and TiO₂ (anatase)**

M. ZUKALOVA, B. LASKOVA, A. ZUKAL, M. BOUSA, L. KAVAN, J. Heyrovsky Institute of Physical Chemistry of the ASCR, v. v. i., Prague, Czech Republic

FE:P13 **TiO_x Films Prepared by Sol-gel Method for Organic Solar Cells**

HYUN-SUB KIM, HYUN-SOO CHO, **DO-HEYOUNG KIM**, School of Chemical Engineering, Chonnam National University, GwangJu, Korea

SYMPOSIUM FF

MAGNETIC MATERIALS FOR ENERGY

FF:P02 **The Heating Effect of Iron Cobalt Magnetic Nanofluids in an Alternating Magnetic Field: Application in Hyperthermia Treatment**

A. SHOKUH FAR, S.S.S AFGHAHI, Advanced Materials and Nanotechnology Research Laboratory, Department of Materials Science and Engineering, K.N. Toosi University of Technology, Tehran, Iran

FF:P04 **Cluster-Spin-Glass Behavior in La_{0.7}Ca_{0.3}MnO₃ Nanoparticles**

TRAN DANG THANH, THE LONG PHAN, SEONG CHO YU, **SUHK KUN OH**, Department of Physics, Chungbuk National University, Cheongju, Korea

FF:P05 **Magnetocaloric Properties of Gd-Ge-Si Alloys Modified with Iron**

J. FERENC, **M. KOWALCZYK**, G. CIESLAK, T. ERENC-SEDZIAK, T. KULIK, Faculty of Materials Science and Engineering, Warsaw University of Technology, Warsaw, Poland

FF:P06 **Internal Friction in Superelastic FeMnAlNi Alloys**

V.V. KHOVAYLO, I.S. GOLOVIN, National University of Science and Technology "MIS&S", Moscow, Russia; T. OMORI, R. KAINUMA, Department of Materials Science, Graduate School of Engineering, Tohoku University, Sendai, Japan

FF:P10 The Magnetocaloric Effect of GdFe_{1-x}CoxSi Compounds

P. ZACKIEWICZ, L. HAWELEK, P. WLODARCZYK, M. KAMINSKA, A. KOLANO-BURIAN, Institute of Non-Ferrous Metals, Materials Science Department, Laboratory of Advanced Magnetic Materials, Gliwice, Poland; A. CHROBAK, University of Silesia, Institute of Physics, Katowice, Poland

FF:P11 Entropy Change Calculations for Pure Gd and a Ni-Mn-Cu-Ga Heusler Alloy: Constant Field vs. Constant Temperature Experiment

J. FERENC, M. KOWALCZYK, R. WRÓBLEWSKI, G. CIESLAK, K. SIELICKI, M. LEONOWICZ, T. KULIK, Faculty of Materials Science and Engineering, Warsaw University of Technology, Warsaw, Poland

FF:P12 First Principles Investigations of Magnetic and Structural Properties of Heusler Fe-Mn-Al and Fe-Ni-Mn-Al Alloys

V.D. BUCHELNIKOV, M.A. TUFATULLINA, Chelyabinsk State University, Chelyabinsk, Russia; V.V. SOKOLOVSKIY, Chelyabinsk State University, Chelyabinsk, Russia, National University of Science and Technology "MISiS", Moscow, Russia; M.A. ZAGREBIN, Chelyabinsk State University, Chelyabinsk, Russia, South Ural State University (National University), Chelyabinsk, Russia

FF:P14 Ab initio and Monte Carlo Studies of Magnetic and Magnetocaloric Properties in Polycrystalline Heusler Alloys

V.V. SOKOLOVSKIY, Chelyabinsk State University, Chelyabinsk, Russia, National University of Science and Technology "MISiS", Moscow, Russia; V.D. BUCHELNIKOV, O.O. PAVLUKHINA, J.A. KUZMINA, Chelyabinsk State University, Chelyabinsk, Russia, V.V. SOKOLOVSKIY, M.A. ZAGREBIN, Chelyabinsk State University, Chelyabinsk, Russia, South Ural State University (National University), Chelyabinsk, Russia

FF:P16 Phase Diagram of Ni₅₀Mn₃₅In₁₅ Heusler Alloy with Exchange Inversion

M.A. ZAGREBIN, National Research South Ural State University, Chelyabinsk, Russia, Chelyabinsk State University, Chelyabinsk, Russia; V.D. BUCHELNIKOV, K.I. KOSTROMITIN, Chelyabinsk State University, Chelyabinsk, Russia

FF:P17 Synthesis and Magnetism in Fe₅(Si,P)B₂

J. CEDERVALL, M. SAHLBERG, Department of Chemistry - The Angstrom Laboratory, Uppsala University, Uppsala, Sweden

FF:P18 Microencapsulation Process of Intermetallic Compounds with Sn for Applications in Magnetic Refrigerators and Thermomagnetic Motors

C.S. FRANCISCO, S. GAMA, M.R. FELEZ, R.A.G. SILVA, Departamento de Ciencias Exatas e da Terra, UNIFESP - Diadema, SP, Brazil

FF:HP19 Effect of Al-doping on the Structural and Magnetic Properties of ErFe₂ Laves-phase Compounds for Magnetocaloric Applications

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FF:HP20 Tomographic Imaging of Metal vs. Polymer Matrix Magnetocaloric Composites

A. WASKE¹, A. FUNK^{1,3}, M. KRAUTZ², B. WEISE^{1,3}, B. PULKO⁴, K. SKOKOV⁵, O. GUTFLEISCH⁵, J. ECKERT^{1,3}, ¹Institute of Complex Materials, IFW Dresden, Dresden, Germany; ²Institute for Metallic Materials, IFW Dresden, Dresden, Germany; ³Institute for Material Science, TU Dresden, Dresden, Germany; ⁴University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia; ⁵Material Science, TU Darmstadt, Darmstadt, Germany

SYMPOSIUM FG

PHOTOVOLTAIC SOLAR ENERGY CONVERSION: SILICON AND BEYOND

FG:P03 Effect of the Thermal Annealing on the Nitrogen Concentration of N-doped TiO₂ Thin Films Deposited by HiPIMS

C. STEGEMANN¹, R.S. MORAES¹, D.A. DUARTE^{3, 4}, A.S. DA SILVA SOBRINHO¹, **M. MASSI**^{1, 2}, ¹Technological Institute of Aeronautics, Plasmas and Processes Laboratory, São José dos Campos, SP, Brazil; ²Federal University of São Paulo, Institute of Science and Technology, São José dos Campos, SP, Brazil; ³Catholic University of Santa Catarina, Joinville, SC, Brazil; ⁴Federal University of Santa Catarina, Center of Mobility Engineering, Joinville, SC, Brazil

FG:P04 Environmental Friendly Solvents towards Roll-to-Roll Solar Cells Fabrication

A. CALABRESE, **C. CARBONERA**, A. COMINETTI, A. PELLEGRINO, A. SAVOINI, R. PO', Solar Energy Department Research Centre for Non-Conventional Energies, Istituto ENI Donegani, Eni S.p.A., Novara, Italy; D. KOTOWSKI, S. LUZZATI, Consiglio Nazionale delle Ricerche, CNR, Istituto per lo Studio delle Macromolecole, ISMAC, Milan, Italy

FG:HP07 CuZnSnSe Nanotubes and Nanowires by Template Electrosynthesis

R. INGUANTA, M. BATTAGLIA, S. PIAZZA, C. SUNSERI, Laboratorio di Chimica Fisica Applicata, Dipartimento di Ingegneria Chimica, Gestionale, Informatica, Meccanica, Università di Palermo, Palermo, Italy

FG:HP08 Single-side Boron Profile Control in n-type Silicon Wafer and Photovoltaic Design by PC1D Calculations

WOON JO CHO, JIN DONG SONG, IL KI HAN, Center for Opto-Electronic Conversion System, Korea Institute of Science and Technology, Seoul, Korea

SYMPOSIUM FH

RECENT DEVELOPMENTS IN THE RESEARCH AND APPLICATION OF TRANSPARENT CONDUCTING AND SEMICONDUCTING OXIDES

FH:P01 Oxyfluoride Glasses as Promising Materials

N. SAVCHENKO, L. IGNATEVA, YU. MARCHENKO, Institute of Chemistry FEB RAS, Vladivostok, Russia; V. BOUZNİK, Baikov Institute of Metallurgy and Materials Science, Moscow, Russia

FH:P04 Facile Synthesis of One-dimensional Bismuth Oxychloride Nanostructures as Potential Visible Light-driven Photocatalysts

LI-CHIA TIEN, YU-CHEN LAI, YU-LIN LIN, SENG-YU CHEN, Department of Materials Science and Engineering, National Dong Hwa University, Shoufeng, Hualien, Taiwan

FH:P05 Synthesis of Homogeneous Indium-free Conductive Nanomaterials by a Water Controlled-release Solvothermal Process

SHU YIN, C.S. GUO, B. LIU, Q. DONG, T. SATO, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan

FH:P07 Effect of Oxygen Partial Pressure on Electrical Properties of Ga,P co-doped ZnO Thin Films

WOO-SEOK NOH, JUNG-A LEE, JOON-HYUNG LEE, YOUNG-WOO HEO, HEE-YOUNG LEE*, **JEONG-JOO KIM**, Kyungpook National University, Daegu, Korea; *Yeungnam University, Korea

FH:P09 Synthesis of Indium Doped ZnO TCO Films for Organolead Hybrid PV Cells

O. DINNER, G.E. SHTER, G.S. GRADER, Technion-Israel institute of Technology, Haifa, Israel

FH:P10 In₂O₃-ZnO-SnO₂ Transparent Conducting Oxide Thin Films with Very Low Indium Content

M.A. PUTRI, KI HWAN KIM, CHANG YOUNG KOO, JUNG-A LEE*, JEONG-JOO KIM*, **HEE YOUNG LEE**, Yeungnam University, Gyeongsan, South Korea; *Kyungpook National University, South Korea

FH:HP11 (Ga_{1-x}In_x)₂O₃ Layers Grown by Metal Organic Vapour Phase Epitaxy

M. BALDINI, D. GOGOVA, R. SCHEWSKI, M. ALBRECHT, M. SCHMID-BAUER, Z. GALAZKA, G. WAGNER, Leibniz Institute for Crystal Growth, Berlin, Germany

SYMPOSIUM FI

MATERIALS AND TECHNOLOGIES FOR SOLID STATE LIGHTING

FI:P03 Tunable Upconversion Luminescence of Scheelite Structural Crystals

JUNG-IL LEE, SUNG-LIM RYU, **JEONG HO RYU**, Department of Materials Science and Engineering, Korea National University of Transportation, Chungju, Chungbuk, Korea; JOON HWANG, Department of Aeronautical and Mechanical Design Engineering, Korea National University of Transportation, Chungju, Chungbuk, Korea; CHANG WOO HONG, Department of Civil Engineering, Korea National University of Transportation, Chungju, Chungbuk, Korea

FI:P04 Electrical and Optical Properties of Ge_{1-y}Sn_y Grown on Si Substrates

MEE-YI RYU¹, YUNG KEE YEO², T. HARRIS², J. KOUVETAKIS³, R. BEELER³, ¹Kangwon National University, Korea; ²Air Force Institute of Technology, USA; ³Arizona State University, USA

FI:P08 Yttrium Disilicate Stability in Aqueous Medium

S.C. SANTOS, C. YAMAGATA, **S. MELLO-CASTANHO**, Nuclear and Energy Research Institute, IPEN-CCTM, Sao Paulo, SP, Brazil; W. ACCHAR, Federal University of Rio Grande do Norte, UFRN, Natal, RN, Brazil

FI:HP09 White Light Emitting Nanocomposite Films Constituted of Lanthanide Orthophosphates Nanophosphors Dispersed in Silicon

A. GARRIDO HERNÁNDEZ^{1,2}, A. POTDEVIN², **D. BOYER**², G. CHADEYRON², A. GARCÍA MURILLO¹, F. DE J. CARRILLO ROMO¹, R. MAHIOU², ¹Instituto Politécnico Nacional, CIITEC IPN, México D.F, México; ²Institut de Chimie de Clermont-Ferrand, UMR 6296 CNRS / UBP / ENSCCF, Aubiere Cedex, France

SYMPOSIUM FJ

MATERIALS CHALLENGES FOR FUTURE NUCLEAR FISSION AND FUSION TECHNOLOGIES

FJ:P04 Microstructural Investigation of Tungsten Exposed to ITER Relevant ELM Loads of Deuterium Plasma Emitted by Powerful Plasma Focus Device

L. CIUPINSKI, Warsaw University of Technology, Warsaw, Poland

FJ-10:P02 Leaching Behaviour of Salt Wastes Conditioned with Sodalite Blended with two Different Glass Powders

M. CAPONE, G. DE ANGELIS, C. FEDELI, ENEA, Centro Ricerche Casaccia, Roma, Italy; F. GIACOBBO, M. DA ROS, E. MACERATA, M. MARIANI, Politecnico di Milano, Milano, Italy

**FK - 5th International Conference
NOVEL FUNCTIONAL CARBON
NANOMATERIALS**

FK:P01 Reasearch of Diamond-like Carbon Film Deposited by Double Pulsed Laser

YONG CHENG, SHUYUN WANG, YIMIN LU, GUOJUN HUANG, YANLONG GUO, XU LIU, BIN SUN, Opto-Electronics Facility of Wuhan Mechanical College, Wuhan, China

FK:P02 Effect of Surface Morphology and Crystalline Orientation of Copper Substrate on the Quality and Structure of Graphene Synthesized by Chemical Vapor Deposition

A. IBRAHIM¹, A. OWAIS², M. ATIEH², R. KARNIK³, T. LAOUI¹, ¹Department of Mechanical Engineering, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia; ²Department Chemical Engineering, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia; ³Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA

FK:P03 Large-scale Synthesis of Nanoporous Carbide-derived Carbons

A. GOGOTSI¹, Y. GOGOTSI², ¹Materials Research Centre, Kiev, Ukraine; ²A.J. Drexel Nanotechnology Institute, Department of Material Science and Engineering, Drexel University, Philadelphia, PA, USA

FK:P05 Obtaining and Characterization of Antistatic Packing for Electronic Components Based on Pet Loaded with Carbon Black

L. FIGUEIREDO DE MIRANDA, A. DOS SANTOS MESQUITA, A.H. MUNHOZ Jr., T.J. MASSON, M.C. TERENCE, S.B. FALDINI, Universidade Presbiteriana Mackenzie, Sao Paulo, Brazil

FK:P06 A Facile Route for the Synthesis of Graphitic Carbon-Fe-based Nanocomposites from K₂CO₃-activated Sugarcane Bagasse

V. LORYUENYONG^{1,2}, J. PHONGTHONGCHAROEN¹, K. KLOMCHIT¹, R. CHAIKLANG¹, A. BUASRI^{1,2}, ¹Department of Materials Science and Engineering, Faculty of Engineering and Industrial Technology, Silpakorn University, Nakhon Pathom, Thailand; ²National Center of Excellence for Petroleum, and Advanced Materials, Chulalongkorn University, Bangkok, Thailand

FK:P07 Modelling of the Low Molecular Fluoropolymer Forms. Characterization of the IR- and NMR Spectra

L. IGNATIEVA, Institute of Chemistry, FEB RAS, Vladivostok, Russia; V. BOUZNİK, A.A. Baykov Institute of Metallurgy and Material Science RAS, Moscow, Russia

FK:P08 Effect of Explosive Processing on the Structure and Properties of Ultrafine Polytetrafluoroethylene

G.A. ZVEREV, L.N. IGNATIEVA, V.G. KURYAVYI, E.B. MERKULOV, A.B. SLOBODYUK, Institute of Chemistry FEB RAS, Vladivostok, Russia; N.A. ADAMENKO, A.V. KAZUROV, Volgograd State Technical University, Volgograd, Russia; V.M. BUZNİK, Institute of Metallurgy and Material Science, Moscow, Russia

FK:P12 Liquid Crystal Assisted Selective Separation of Large Graphene Oxide and its Size Dependent Oxygen Reduction Catalytic Effect

KYUNGEUN LEE, JIEUN KIM, JOON WOON LIM, SANG OUK KIM, IBS, KAIST, Daejeon, South Korea

FK:P14 The Possibilities of Graphenes Application in Textronic Devices

I. KRUCINSKA, **M. PUCHALSKI**, E. SKRZETUSKA, Lodz University of Technology, Department of Material and Commodity Sciences and Textile Metrology, Lodz, Poland

FK:P15 Improvement of Performance of Paper Transistor Using Carbon-nanotube-composite Paper and Its Application to Logic Circuit

Y. HAMANA, Y. KAWAMURA, T. OYA, Yokohama National University, Yokohama, Japan

FK:P16 Development of Carbon-nanotube-composite-thread and it's Application to "Thread Transistor"

M. YOSHIDA, T. OYA, Yokohama National University, Yokohama, Japan

FK:P17 Energy Gap Associated to Photocatalytic Activity of MWCNT/TiO₂ Nanocomposites

S. DA DALT^{1,2}, A.K. ALVES¹, J.S. PINTO¹, C.P. BERGMANN¹, ¹Department of Materials, Federal University of Rio Grande do Sul, RS, Brazil; ²Engineering Center, Federal University of Pelotas, RS, Brazil

FK:HP18 Carbon Nano/Microcoils-Polyurethane Composites Shielding Materials for Electromagnetic Interference

GI-HWAN KANG, **SUNG-HOON KIM**, Center for Green Fusion Technology and Department of Engineering in Energy & Applied Chemistry, Silla University, Busan, South Korea

FK:HP19 High-Yield, Single-step Separation of Metallic and Semi-conducting SWCNTs Using Block Copolymers at Low Temperatures

C.M. HOMENICK, A. ROUSINA-WEBB, FUYONG CHENG, M.B. JAKUBINEK, P.R.L. MALENFANT, B. SIMARD, Security and Disruptive Technologies Portfolio, National Research Council Canada, Ottawa, Ontario, Canada

FK:HP20 New Physical Mechanism of Diamond Growth in Low Pressure Microwave Plasma

A. KROMKA *et al*, Institute of Physics ASCR, Prague, Czech Republic

FK:HP21 Structural Characterization and Thermophysical Properties of Ag-C Composites

N. SOBCZAK, M. HOMA, **J. SOBCZAK**, A. GAZDA, R. NOWAK, K. PIETRZAK, K. FRYDMAN, D. WÓJCIK-GRZYBEK, A. STRONY-NEDZA, Foundry Research Institute, Krakow, Poland

FM - International Conference

**NOVEL NON-VOLATILE INORGANIC
MEMORY DEVICES: MATERIALS,
CONCEPTS AND APPLICATIONS**

FM:P02 Extraction of Filament Properties in Resistive Random Access Memory (ReRAM) Consisting of Binary-transition-metal-oxides

T. MORIYAMA¹, R. KOISHI¹, K. KIMURA¹, S. KISHIDA^{1,2}, K. KINOSHITA^{1,2}, ¹Tottori University, Koyama-Minami, Tottori, Japan; ²Tottori University Electronic Display Research Center, Koyama-Kita, Japan

FM:P04 Analysis of Resistive Switching Effect Induced by Hydrogen Introduction Using X-ray Absorption Fine Structure

A. HANADA¹, H. MIURA¹, T. NOTSU¹, H. OSAWA², T. INA², M. SUZUKI², N. KAWAMURA², M. MIZUMAKI², T. URUGA², **S. KISHIDA**^{1,3}, K. KINOSHITA^{1,3}, ¹Tottori University, Koyama-Minami, Tottori, Japan; ²JASRI / SPring-8, Hyogo, Japan; ³Tottori University Electronic Display Research Center, Koyama-Minami, Tottori, Japan

FM:P05 Elucidation of Metal Diffusion Mechanism in Conducting-Bridge Random Access Memory (CB-RAM) Using First-principle Calculation

K. KINOSHITA^{1, 2}, S. YURA¹, T. YAMASAKI³, K. NAKADA¹, A. ISHII¹, S. KISHIDA^{1, 2}, ¹Tottori University, Koyama-Minami, Tottori, Japan; ²Tottori University Electronic Display Research Center, Koyama-Kita, Japan; ³National Institute for Materials Science, Sengen, Ibaraki, Japan

FM:P06 Resistive Switching Behavior of Undoped Hematite Film with Low Resistivity

Y. OGAWA, Y. SUTOU, D. ANDO, J. KOIKE, Department of Materials Science, Tohoku University, Sendai, Miyagi, Japan

FM:P07 Switching in Polymer Memory Devices based on Polymer and Nanoparticles Admixture

Z. AL HALAFI, S. PAUL, Emerging Technologies Research Centre, De Montfort University, Leicester, UK

FM:P08 Two Terminal Non-volatile Memory Devices using Diamond-like Carbon and Silicon Nano-structures

S.R. ALOTAIBI, D. PRIME, S. PAUL, Emerging Technologies Research Centre, De Montfort University, Leicester, UK

FM:P09 Magnon and Electromagnon Excitations in BiFeO₃

N. FURUKAWA, Dept. of Physics, Aoyama Gakuin University, Sagami-hara, Japan; S. MIYAHARA, Department of Applied Physics, Fukuoka University, Fukuoka, Japan

FM:P10 Atomic Layer Deposition of Hf_xZr_{1-x}O_y and TiN Thin Films for Ferroelectric Memory Applications

A.G. CHERNIKOVA, A.M. MARKEEV, YU.YU. LEBEDINSKII, A.V. ZABLOTSKIY, M.G. KOZODAEV, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow region, Russia

FM:P11 Memristive Switching of Thin Sputtered Vanadium Dioxide Films

S. FABRETTI, S. NIEHÖRSTER, Bielefeld University, Bielefeld, Germany; A. THOMAS, Bielefeld and Mainz University, Germany

FM:P12 TaO Based Memristive Tunnel Junctions

S. NIEHÖRSTER, S. FABRETTI, M. SCHÄFFERS, Bielefeld University, Bielefeld, Germany; A. THOMAS, Mainz University, Mainz, Germany

FM:HP14 Silicon-on-Insulator Based Metal-Insulator-Semiconductor Structures as Non-volatile Memory and Photo Diodes with Light Enhanced Memory and Responsivity in 245 nm to 880 nm

V. MIKHELASHVILI, D. CRISTEA, G. EISENSTEIN, Electrical Engineering Dept., Technion, Haifa, Israel; G. ATIYA, W.D. KAPLAN, Material Engineering Dept., Technion, Haifa, Israel

FN - 7th International Conference

**SCIENCE AND ENGINEERING OF NOVEL
SUPERCONDUCTORS**

FN:P02 Thermopower Studies of Multiband Superconductors

K. OGANISIAN, K. ROGACKI, Institute of Low Temperature and Structure Research, Wroclaw, Poland; N.D. ZHIGADLO, J. KARPINSKI, Laboratory for Solid State Physics, ETH, Zurich, Switzerland

FN:P03 Critical Current Density and Pinning Energy of Partial Melted Sm-based Superconductor

H. IMAO, Department of Control Engineering, Matsue National College of Technology, Matsue, Japan

FN:P04 Critical Current of Bi-2212 Single Crystal by Doping Oxides as a Pinning Center

T. AGOU, H. IMAO, Department of Control Engineering, Matsue National College of Technology, Matsue, Japan

FN:P05 High Critical Currents in Single Grain YBa₂Cu₃O_y Bulk Superconductors Produced by Infiltration-growth Process

K. NAKAZATO¹, M. MURALIDHAR¹, K. INOUE¹, M.R. KOBLISCHKA², M. MURAKAMI¹, ¹Superconducting Materials Laboratory, Department of Materials Science and Engineering, Shibaura Institute of Technology, Tokyo, Japan; ²Institute of Experimental Physics, Saarland University, Saarbrücken, Germany

FN:P06 Terahertz Emission from Triple Mesa Structures Fabricated from Intrinsic Josephson Junctions in Cuprate Superconductors

Y. DEMIRHAN, L. OZYUZER, H. SAGLAM, F. TURKOGLU, H. KOSEOGU, M. KURT, H. ALABOZ, Department of Physics, Izmir Institute of Technology, Urla, Izmir, Turkey; K. KADOWAKI, University of Tsukuba, Tsukuba, Japan

FN:P07 Transition to the Normal State Induced by High Current Densities in High-T_c Superconductor Microbridges under Thermal Smallness Conditions

J.M. DOVAL, J. MAZA, J.A. VEIRA, M. TELLO*, **F. VIDAL**, LBTS. Universidad de Santiago de Compostela, Spain; *Facultad de Ciencias, Universidad del País Vasco, Bilbao, Spain

FN:HP08 STM Investigation of Ferromagnet/Superconductor Hybrid Structures

M. IAVARONE¹, S. MOORE¹, J. FEDOR¹, V. NOVOSAD², J. PEARSON², G. KARAPETROV³, ¹Temple University, Physics Department, Philadelphia, PA, USA; ²Argonne National Laboratory, Materials Science Division, Argonne, IL, USA; ³Drexel University, Physics Department, Philadelphia, PA, USA

**FO - 10th International Conference
MEDICAL APPLICATIONS OF
NOVEL BIOMATERIALS AND NANO-
BIOTECHNOLOGY**

FO:P02 Bacterial Detection Based on the T7 Virus-nanoparticle Complexes

JONG-WOOK LEE, **GUN HYUK JANG**, KWAN HYI LEE, Center for Biomaterials, KIST Biomedical Research Institute, Seoul, Rep. of Korea; Dept. of Biomedical Engineering, University of Science and Technology (UST), Seoul, Rep. of Korea

FO:P03 Synthesis of Bioglass-ceramic by Sol-gel Method for Medical Application

P. ESLAMI, G. BALDI, Ce.Ri.Col Research Center of Colorobbia, Sovigliana Vinci, Italy

FO:P04 Characterization and Biocompatibility Evaluation of Hydroxyapatite Doped with Silver and/or Fluorine

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FO:P08 Coating of Hydroxyapatite on the Surface-modified Polyetheretherketone

N. SUZUKI¹, T. UMEDA¹, H. KUWAHARA¹, Y. MUSHA², K. ITATANI¹, ¹Department of Materials and Life Sciences, Sophia University, Tokyo, Japan; ²2nd Department of Orthopaedic Surgery, Toho University, Tokyo, Japan

FO:P11 Residual Thermal Stress of Spinel Based-ceramic Infiltrated with Glass Rich in Lanthanum

P. CIPRIANO DA SILVA¹, C. DOS SANTOS^{1,2}, ¹Unifoa Centro Universitario de Volta Redonda, Volta Redonda, RJ, Brazil; ²UERJ- FAT, Brazil

FO:HP12 Self-assembly Mechanism of Magnetoplasmonic Nanoparticles under a Static Magnetic Field

JAEBEOM LEE, SOO HYUNG KIM, Pusan National University, Miryang, Rep. of Korea

FO-8:P01 Photo-responsive Soft Actuators Based on Spiropyran Functionalised Hydrogels

A. DUNNE, L. FLOREA, D. DIAMOND, INSIGHT, National Centre for Sensor Research, School of Chemical Sciences, Dublin City University, Dublin, Ireland

FO-8:P02 Effect of Titanium Dioxide Nanoparticles on Mechanical and Thermal Properties of Poly(Lactic Acid) and Poly(Butylene Succinate) Blends

A. BUASRI, G. BURANASING, R. PIEMJAIWANG, S. YOUSATIT, V. LO-RYUENYONG, Department of Materials Science and Engineering, Faculty of Engineering and Industrial Technology, Silpakorn University, Nakhon Pathom, Thailand

FO-8:P07 Tannic Acid, as a Plant-inspired Molecular ‘Stapler’, for Degradable DNA Hydrogels

M. SHIN, Graduate School of Nanoscience & Technology (WCU), KAIST, Daejeon, Korea; H. LEE, Graduate School of Nanoscience & Technology (WCU) and Department of Chemistry, KAIST, Daejeon, Korea

FO-8:P08 Multi-material Swollen Polymeric Films with Biocidal Properties

L.G. KOLZUNOVA, Institute of Chemistry, FEB RAS; Far Eastern Federal University, Vladivostok, Russia

FO-8:P09 Stimuli-controlled Movement of Droplets and Polymeric “Vehicles”

W. FRANCIS, L. FLOREA, D. DIAMOND, INSIGHT, National Centre for Sensor Research, School of Chemical Sciences, Dublin City University, Dublin, Ireland

FO-8:P10 Increased Stability of Polyphenol-tethered Alginate Hydrogels

SANG HYEON HONG¹, J.H. RYU², H. LEE¹, ¹Chemistry Department, KAIST, Daejeon, Republic of Korea; ²Program in Nanoscience & Technology, KAIST, Republic of Korea

FO-8:P11 New Strategy to Fabricate Catalyst-mediated Hydrogel, in which the Catalyst is not Included in the Gel

EUNKYOUNG BYUN, H. LEE, Department of Chemistry, KAIST, Daejeon, Republic of Korea; J.H. RYU, The Graduate School of Nanoscience and Technology, KAIST, Daejeon, Republic of Korea

FO-8:P12 Natural Polymers as Heat and Moisture Exchange Devices for Medical Applications

B. VAZQUEZ, A. NICOSIA, F. BELOSI, G. SANTACHIARA, Institute of Atmospheric Sciences and Climate (ISAC-CNR), Bologna, Italy; P. MONTICELLI, Pollution Srl, Budrio (Bo), Italy; M. SANDRI, E. SAVINI, A. TAMPIERI, Institute of Science and Technology for Ceramics (ISTEC-CNR), Faenza (RA), Italy

FO-8:P13 Star-shaped Oligo(Ethylene Glycols) Functionalized with Desaminotyrosine and Desamino Tyrosyl Tyrosine

K.K. JULICH-GRUNER, T. ROCH, A.T. NEFFE, A. LENDLEIN, **C. LOEWENBERG**, Institute of Biomaterial Science and Berlin-Brandenburg Center for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany

FO-9:P01 Wearable Chemical Sensing - Sensor Design and Sampling Techniques for Real-time Sweat Analysis

J.A. DEIGNAN, S. COYLE, G. MATZEU, C. O’QUIGLEY, C. ZULIANI, D. DIAMOND, INSIGHT, National Centre for Sensor Research, Dublin City University, Glasnevin, Dublin, Ireland; P. FITZPATRICK, G. WARRINGTON, School of Health and Human Performance, Dublin City University, Glasnevin, Dublin, Ireland

Social Programme

Welcome Party “Terme Tettuccio” Montecatini Terme

*Monday June 16
20.30 - 23.30*

The Welcome Party of the Forum will be held on June 16 evening at the magnificent “Tettuccio” (“Small Roof”) establishment, the most important and renowned Spa in Montecatini.

The Tettuccio establishment, known as the “bagno nuovo” (new baths) from as early as the 14th century, derived its name from the canopy (or tettoia) that covered the spring. The building, designed by architect Gaspero Maria Paoletti, between 1779 and 1781, had a particularly striking rusticated

door. In 1916, Florentine architect Ugo Giovannozzi drew up plans to renovate the entire complex. This project, based on the concept of the Roman baths, was for a Spa establishment set in leafy grounds planted with Lebanon cedars, palms, sequoias, acacias,

laurel trees, wisteria, pines and lime trees, and adorned with impressive colonnades, rostra, fountains and large flower-beds bordered by box hedges. The building’s main focus was to be a conch-shaped granite fountain, held up by a group of bronze statues of marine figures, whose waters would be collected in a pool with a parapet decorated with seahorses.

At the Welcome Party delegates will enjoy a taste of a large variety of the world renowned Tuscan traditional dishes and drinks in an elegant and friendly environment.



Entrance ticket for non-registered companions: 30.00 EUR

Gala Concert

*“Terme Tettuccio” **

Wednesday June 18
21.30 - 23.00



The “Gala Concert” will be performed by the “Quartetto D’Archi dell’Arena di Verona” (“String Quartet of the Arena di Verona”) in the magnificent open spaces of “Terme Tettuccio”.

The String Quartet of the Arena of Verona springs up from the idea of conveying into chamber language the authentic magic of the Arena the millenary temple where music has enchanted and moved the audience from all over the world for centuries.

The original and deep musical message proposed by the Arena String Quartet expresses the passions, dramas, possible or impossible love stories which are inborn in melodrama; succeeding in this way to transmit the emotions of the atmosphere of Arena, the most beautiful theatre in the world.

Quartetto d’Archi dell’Arena di Verona

Gunther Sanin 1st Violino

Vincenzo Quaranta 2nd Violino

Sara Airoidi Violoncello

Luca Pozza Viola

Pianista: Ivan Tibolla

Soprano: Teresa di Bari

Tenore: Aldo Caputo

Technical Management

Associazione Culturale “Il Parnaso”

The programme will include pieces by: Rossini, Donizetti, Lehar, Mozart, Falvo/Fusco, and Puccini.

**In case of bad weather, the Concert will be held at “Teatro Imperiale”, Piazza Massimo D’Azeglio 5, Montecatini Terme.*

Entrance ticket for non-registered companions: 20.00 EUR (subjected to place availability)

Conference Dinner

“Fattoria Medicea”

Thursday June 19
20.00 - 23.30

The Conference Dinner of the Forum will be held at the “Fattoria Medicea” (Medici Farm) on Thursday, June 19 evening (20.00-23.30). Located in Monsummano Terme, near Pistoia in the heart of the Valdinievole area, the Fattoria Medicea was built in 1515 by order of the Grand Duke Ferdinando I, the Grandson of Lorenzo de’ Medici, on the design and under the management of the architect John Mechini. Today, after a long and careful restoration, commissioned in 1995 by the Prince Borghese family, the present owners, this extraordinary property has regained its unique majesty and is the ideal location for prestigious national and international events.



Entrance ticket for non-registered companions: 60.00 EUR (subjected to place availability)

Optional Tours

PISTOIA

Monday June 16, afternoon

14.30 - 19.00

Pistoia, characterized by Medieval buildings, is an ideal destination for those who want to know a typical Tuscan town far away from mass tourism. In Pistoia guide tour begins at Piazza S. Francis, from which you will soon reach the Romanesque church of S. Andrea with the beautiful marble pulpit by Giovanni Pisano, one of the most interesting works of art in Pistoia. Moving on to the Hospital of the Log, with its wonderful facade, we reach the Piazza del Duomo with its Romanesque cathedral, baptistery and the well-preserved city's buildings. Then we cross the bustling market town of Piazza della Sala to reach the church of S. John Fuoricivitas with its interesting pulpit of Fra 'William of Pisa and the Visitation of Luca della Robbia.



Meeting point: entrance of the “Palazzo dei Congressi” at 14.30. Return to Montecatini Terme at about 19.00. The participation fee (25 EUR) includes transportation, city entrance tax, English speaking hostess and local guide.

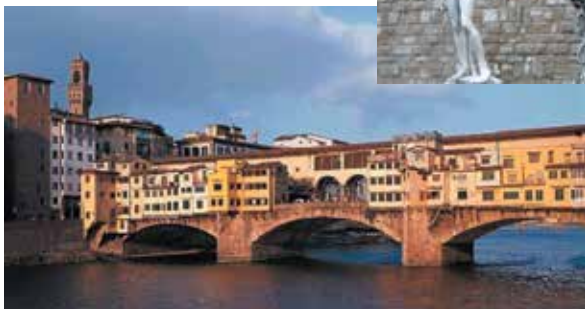
FIRENZE (FLORENCE)

*Tuesday June 17, full day
9.00 - 19.00*

In the morning visit to the City Center. An unrivalled itinerary of art and culture in the heart of Florence, Cathedral (Santa Maria del Fiore), with its Cupola by Brunelleschi, the Campanile (Bell Tower) by Giotto, and the Baptistry with the famous Gates of Paradise by Ghiberti and Andrea Pisano, Piazza della Signoria dominated by imposing Palazzo



della Signoria flanked by the Loggia of Lanzi and the beautiful Neptune Fountain, Ponte Vecchio, the Uffizi Gallery, etc. In the afternoon, after lunch, visit to Poggio Imperiale, Piazzale Michelangelo and San Miniato Church.



Meeting point: entrance of the “Palazzo dei Congressi” at 9.00. Return to Montecatini Terme at about 19.00.

The participation fee (60 EUR) includes transportation, city entrance tax, English speaking hostess, local guide and lunch.

SIENA - SAN GIMIGNANO

Wednesday June 18, full day
9.00 - 19.30

Takes you through one of the most attractive landscapes of Central Italy, with wooded hills and valleys and the renowned Chianti area, famous throughout the world for its high-quality wines. Siena is a



treasure of history and art with its rich School of Sienese Painting, its marvellous Cathedral, the Palazzo Comunale rising majestically from the lovely fan-shaped Piazza del Campo, the Tower of Mangia, San Domenico, Piazza Salimbeni, Palazzo Ghigi, Piazza del Capitano, etc. It will leave unforgettable memories.

In the afternoon, visit to S. Gimignano, a small town famous for its numerous towers. It is a real gem of Medieval architecture which takes you back to the time of great battles and romantic love stories, as described by minstrels' tales.



Meeting point: entrance of the "Palazzo dei Congressi" at 9.00. Return to Montecatini Terme at about 19.30.

The participation fee (65 EUR) includes transportation, cities entrance taxes, English speaking hostess, local guides and lunch.

Tour to PISA

*Thursday June 19, morning
9.00 - 13.30*

Shown is one of the loveliest architectural complexes in the world. On a large smooth lawn stands the Cathedral, the Baptistry and the famous Leaning Tower, a unique group of buildings in an unrivaled setting, the legacy of a past age which now belongs to all mankind. Along the southern side of the piazza lie the buildings of the old University, center of research and thought and famous for scientific disciplines.



Meeting point: entrance of the “Palazzo dei Congressi” at 9.00. Return to Montecatini Terme at about 13.30. The participation fee (30 EUR) includes transportation, city entrance tax, English speaking hostess and local guide.



- 1 Palazzo dei Congressi
- 2 Hotel Tamerice Principe
- 3 Hotel Croce di Malta
- 4 Terme Tettuccio
- 5 Teatro Imperiale