

# SCIENTIFIC PROGRAMME

## 6<sup>th</sup> FORUM ON NEW MATERIALS

### OPENING SESSION

#### WELCOME ADDRESSES

#### Plenary Lectures

**F:PL1 Plasma-based Materials Engineering and Surface Modification**  
**PAUL K. CHU**, Department of Physics and Materials Science, City University of Hong Kong, Kowloon, Hong Kong, China

**F:PL2 Nanoscale Engineering – Challenges and Opportunities**  
**P.M. AJAYAN**, Department of Materials Science and Engineering, Rice University, Houston, TX, USA

**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

### SYMPOSIUM FA

## FUEL CELLS: MATERIALS AND TECHNOLOGY CHALLENGES

#### Oral Presentations

#### Session FA-1

### Solid Oxide (SOFCs) and Molten Carbonate (MFCs) Fuel Cells

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

**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

**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

**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

**FA-1:IL05 Density Functional Theory Combined with Experiments to Study the Triple Phase Boundaries of Solid Oxide Fuel Cells**  
**M. MALAGOLI<sup>1</sup>**, **M.L. LIU<sup>2</sup>**, **HYEON CHEOL PARKA<sup>3</sup>**, **A. BONGIORNO<sup>1</sup>**, <sup>1</sup>School of Chemistry & Biochemistry, Georgia Institute of Technology, Atlanta, GA, USA; <sup>2</sup>School of Material Science & Engineering, Georgia Institute of Technology, Atlanta, GA, USA; <sup>3</sup>Advanced Materials Research Center Samsung Advanced Institute of Technology (SAIT), Yongin-si, Republic of Korea

**FA-1:IL06 Effect of Annealing on Crystal Structure and Conductivity of Plasma-Sprayed Protective Oxide for SOFC Interconnects**  
**KUAN-ZONG FUNG<sup>1,2</sup>**, **SHU-YI TSAIA<sup>2</sup>**, **HSIN-CHIA HOAB**, <sup>1</sup>Research Center for Energy Technology and Strategy; <sup>2</sup>Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan, ROC

**FA-1:IL07 Effect of Synthesis Methods on Catalytic and Structural Properties of SrTiO<sub>3</sub> for applications in SOFC anodes**  
**F. MARAZZI**, **A. PAPPACENA**, **M. BOARO**, **A. TROVARELLI**, University of Udine, Udine, Italy

**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

**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

**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

**FA-1:IL11 LPG based Auxiliary Power Unit Development for Application in Recreational Vehicles**  
**G. KOLB**, **M. WICHERT**, **H. PENNEMANN**, Institut für Mikrotechnik Mainz GmbH, Mainz, Germany

**FA-1:IL12 ETRERA 2020 - A project for an Euro-Mediterranean RES, Hydrogen and Fuel Cells Deployment**  
**G. SQUADRITO<sup>1</sup>**, **A. NICITA<sup>1</sup>**, **A. SORACI<sup>2</sup>**, **P. MAZZUCHELLI<sup>3</sup>**, **E. STAMATAKIS<sup>4</sup>**, **I. IBRIK<sup>5</sup>**, **R. SANDERS<sup>6</sup>**, **A. ZAKARYA<sup>7</sup>**, **M. MACHMOUM<sup>8</sup>**, **H. GORGUN<sup>9</sup>**, **B. DAG<sup>10</sup>**, **H. HAMD<sup>11</sup>**, **D. MARTINEZ CALLEJA<sup>12</sup>**, <sup>1</sup>CNR - ITAE, Messina, Italy; <sup>2</sup>INNOVA BIC, Messina, Italy (project coordinator); <sup>3</sup>European Renewable Energy Centre Agency, Brussels, Belgium; <sup>4</sup>Kemtro Ananeosimon Pigon Ke Exikonomis Energeias - CRES, Pikermi/Athens, Greece; <sup>5</sup>An-Najah National University, Omar Ibn Khatab Street Nablus Palestinian-Administered Areas; <sup>6</sup>European Business and Innovation Network, Brussels, Belgium; <sup>7</sup>Centre de Recherche et de Technologie de l'Energie, Technopole Borj Cedria, Tunis Hammam Lif, Tunisia; <sup>8</sup>Université De Nantes, Saint Nazaire, France; <sup>9</sup>Yildiz Technical University, Faculties of Electrical A 101, Esenler/Istabil, Turkey; <sup>10</sup>Türkiye Bilimsel Ve Teknolojik Arastirma Kurumu TUBITAK, Odtu Kampus/Sogutozu, Ankara, Turkey; <sup>11</sup>Université Cadi Ayyad, Bb Prince MY Abdellah, Marrakech, Morocco; <sup>12</sup>Association Madrid Network, Madrid, Spain

#### Session FA-2

### Proton-conducting (PEFCs) and Alkaline (AFCs) Polymer Electrolyte Fuel Cells

**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

**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

**FA-2:IL03 Catalysts and Durability Issues of Polymer Electrolyte Fuel Cells**  
**T.J. SCHMIDT**, Electrochemistry Laboratory, Paul Scherrer Institut, Villigen PSI, Switzerland

**FA-2:IL04 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. CLEEMANN**, **N.J. BJERRUM**, Department of Energy Conversion and Storage, Technical University of Denmark, Kgs. Lyngby, Denmark

**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

**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

**FA-2:IL07 Towards Fuel Cell Vehicle Commercialization**

**I. CERRI**, Toyota Motor Europe, Zaventem, Belgium

**FA-2:IL08 High Temperature Polymer Fuel Cell Membranes Based on PBI**

**E. QUARTARONE**, Dept. of Chemistry, University of Pavia, and INSTM, Pavia Italy

**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

**FA-2:IL10 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

**FA-2:IL11 Water-free Proton-conducting Membranes at Elevated Temperature**

**J. JALILI**, **V. TRICOLI**, Department of Civil and Industrial Engineering, University of Pisa, Pisa, Italy

**FA-2:IL12 Mesoporous Carbon Based Electrocatalyst for ORR**

**ZHENXING LIANG**, South China University of Technology, Guangzhou, P.R. China

**FA-2:IL13 Membranes for Direct Methanol Fuel Cells**

**D. JONES**, ICGM – Aggregates, Interfaces and Materials for Energy, CNRS – Université Montpellier 2, France

**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

**FA-2:IL15 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

**FA-2:IL16 New Approach for the Evaluation of Membranes Transport Properties for PEMFC**

**A. BRUNETTI**, E. FONTANANOVA, E. DRIOLI, **G. BARBIERI**, National Research Council - Institute on Membrane Technology (ITM-CNR), c/o The University of Calabria, Rende CS, Italy

**FA-2:IL17 Hydration and Proton Conductivity of Proton-conducting Ionomers**

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

**FA-2:IL18 Evaluation of Titanium Oxide in the Electrode Structure for Portable PEFCs Applications**

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

**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. GEP- PERT, T. GREESE, F. HASCHKE, J. HERRANZ, P. MADKIKAR, M. PIANA, P. RHEINLÄNDER, A. SIEBEL, X. WANG, Technical Electrochemistry, Chemistry Department, Technische Universität München, Garching, Germany

**FA-2:IL20 Nitrogen-doped Carbon Materials as Catalysts Supports for the Electro-oxidation of Methanol**

**M.J. LAZARO**, M.J. NIETO, D. SEBASTIÁN, C. ALEGRE, M.E. GÁLVEZ, I. SUELVEZ, R. MOLINER, Instituto de Carboquímica, CSIC, Zaragoza, Spain

**FA-2:IL21 Primary Oxide Self-Catalytic Spillover Effect Enabling to Substantiate Reversible Oxygen and Hydrogen Electrodes, and Advanced Reversible (PEMFC vs. WE) Cell**

**M.M. JAKSIC**<sup>1,2</sup>, G.A. BOTTON<sup>3</sup>, J.M. JAKSIC<sup>1</sup>, <sup>1</sup>Institute of Chemical Engineering Sciences, FORTH, Patras, Greece; <sup>2</sup>Faculty of Agriculture, University of Belgrade, Belgrade, Serbia; <sup>3</sup>Department of Materials Science & Engineering, McMaster University, Hamilton, Ontario, Canada

**FA-2:IL22 Non-noble Metal Catalysts for Fuel Cell Applications**

**E.E. WESTSSON**, G.J.M. KOPER, Technical University of Delft, Delft, The Netherlands

**FA-2:IL23 Advanced DMFC Systems**

**M. ODGAARD**, IRD Fuel Cells, Svendborg, Denmark

**FA-2:IL24 Pt-Ru Electrocatalysts for CO and Methanol Oxidation Supported on Carbon Nanofibers: Influence of Synthesis Methods on Activity**

**J.C. CALDERÓN**<sup>1</sup>, L. CALVILLO<sup>2</sup>, M.J. LÁZARO<sup>2</sup>, G. GARCÍA<sup>1</sup>, J.L. RODRÍGUEZ<sup>1</sup>, **E. PASTOR**<sup>1</sup>, <sup>1</sup>Dpto. Química Física, Instituto Universitario de Materiales y Nanotecnología, Universidad de La Laguna, La Laguna, Tenerife, Spain; <sup>2</sup>Instituto de Carboquímica (CSIC), Zaragoza, Spain

**FA-2:IL25 Combination of Stochastic and Numeric Modeling of Fibrous Microstructures of HT-PEFC Gas Diffusion Layers**

**D. FRONING**<sup>1</sup>, J.P. BRINKMANN<sup>1</sup>, G. GAISELMANN<sup>2</sup>, U. REIMER<sup>1</sup>, V. SCHMIDT<sup>2</sup>, W. LEHNERT<sup>1</sup>, <sup>1</sup>Forschungszentrum Jülich GmbH, Jülich, Germany; <sup>2</sup>Ulm University, Germany

## Session FA-3

## State-of-the-art Application Engineering and Demonstrations

**FA-3:IL01 Perspectives for Fuel Cells and Hydrogen in Europe**

**B. DE COLVENAER**, FUEL CELLS AND HYDROGEN JOINT UNDERTAKING, Brussels, Belgium

**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

**FA-3:IL03 Performances of IT-SOFC Stacks Tested in SOFC and SOEC Mode**

**M. BERTOLDI**, S. MODENA, S. CESCHINI, D. MONTINARO, SOFCpower S.p.A, Mezzolombardo, TN, Italy

## Special Session FA-4

## DURAMET Workshop on Direct Alcohol Fuel Cells (DAFCs)

**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

**FA-4:IL02 Improved Durability and Cost-effective Components for New Generation Direct Methanol Fuel Cells - DURAMET Project**

**A.S. ARICO**<sup>1</sup>, CNR-ITAE, Messina, Italy

**FA-4:IL03 DMFC Degradation and Lifetime Studies**

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

**FA-4:IL04 Status and Challenges of Anion-Exchange-Membrane Direct Ethanol Fuel Cell Research**

**RONGRONG CHEN**, J. GUO, Indiana University, Indianapolis, IN, USA; **A. HSU**, San Jose State University, San Jose, CA, USA

**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

**FA-4:IL06 DECORE: A New European Project Aiming at Innovative DEFCs Operating at Intermediate Temperatures**

**G. GRANOZZI**, Department of Chemical Sciences, University of Padova, Italy

**FA-4:IL07 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, Department of Applied Science and Technology, Torino, Italy

**FA-4:IL08 Impact of N/Zr Atomic Ratio on the Oxygen Reduction Reaction Activity of Heat-treated Carbon-supported Zr-oxophthalocyanine**

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

**FA-4:IL09 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<sup>1</sup>, CNR-ITAE, Messina, Italy

**FA-4:IL10 Layered Double Hydroxide (LDH) Nanoplatelets as Fillers for the Preparation of Nafion Hybrid Membranes: NMR Investigation of the Transport Properties of Water and Methanol**

**I. NICOTERA**, C. SIMARI, L. COPPOLA, G.A. RANIERI, University of Calabria, Rende (CS), Italy; **D. GOURNIS**, University of Ioannina, Ioannina, Greece

**FA-4:IL11 Synthesis and Characterization of ZrO<sub>2</sub> 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

**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

**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

**FA-4:L14 Networked Graphitic Structures Grown from Dense Micro-emulsions as High Performance Electrode Material**  
**E. NEGRO**, M. DIECI, D. SORDI, M.G. KOPER, Advanced Soft Matter, Faculty of Applied Science, TU Delft, Delft, The Netherlands

**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<sup>1</sup>, CNR-ITAE, Messina, Italy

**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<sup>1</sup>, CNR-ITAE, Messina, Italy

## Poster Presentations

**FA:P01 Current SOFC R&D Activities at CNR-ITAE**  
**M. LO FARO**, A.S. ARICO<sup>1</sup>, CNR-ITAE, Messina, Italy

**FA:P02 Spin-coated La<sub>0.8</sub>Sr<sub>0.2</sub>Ga<sub>0.8</sub>Mg<sub>0.2</sub>O<sub>3</sub> Electrolyte on Infiltrated anodes for Biogas Utilization**  
**Z. SALEHI**<sup>1</sup>, I. LUISETTO<sup>2</sup>, F. BASOLI<sup>1</sup>, A. D'EIFANIO<sup>1</sup>, S. LICOCCHIA<sup>1</sup>, S. TUTI<sup>2</sup>, E. DI BARTOLOMEO<sup>1</sup>, <sup>1</sup>Department of Chemical Science and Technology and NAST Center, University of Rome Tor Vergata, Rome, Italy; <sup>2</sup>Department of Science, University of Rome "Roma Tre", Rome, Italy

**FA:P03 Copper Doped Lanthanum Strontium Ferrite as Cathode for La<sub>0.8</sub>Sr<sub>0.2</sub>Ga<sub>0.8</sub>Mg<sub>0.2</sub>O<sub>3</sub>**  
**F. ZURLO**<sup>1</sup>, E. DI BARTOLOMEO<sup>1</sup>, A. D'EIFANIO<sup>1</sup>, V. FELICE<sup>2</sup>, I. NATALI SORA<sup>2</sup>, S. LICOCCHIA<sup>1</sup>, <sup>1</sup>Department of Chemical Science and Technologies & NAST Center University of Rome "Tor Vergata", Italy; <sup>2</sup>INSTM 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. VITORINO**<sup>1</sup>, C. FREITAS<sup>2</sup>, J.C.C. ABRANTES<sup>1,2</sup>, J.R. FRADE<sup>1</sup>, <sup>1</sup>DeMAC, CICECO, University of Aveiro, Aveiro, Portugal; <sup>2</sup>UIDM, ESTG, Polytechnic Institute of Viana do Castelo, Viana do Castelo, Portugal

**FA:P06 Synthesis, Properties and Phase Transitions of Pyrochlore- and Fluorite-like Ln<sub>2</sub>RMO<sub>7</sub> (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:P07 Polymorphism and Features of Conductive Properties of Compounds with the Structure of La<sub>2</sub>Mo<sub>2</sub>O<sub>9</sub> in La<sub>2</sub>Mo<sub>2</sub>O<sub>9</sub> - Sm<sub>2</sub>W<sub>2</sub>O<sub>9</sub> - Sm<sub>2</sub>Mo<sub>2</sub>O<sub>9</sub> System**  
**V.I. VORONKOVA**, E.P. KHARITONOVA, M.V. Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia

**FA:P08 Ce<sub>0.8</sub>Gd<sub>0.2</sub>O<sub>1.9</sub> Obtained from Nanopowder through Two-step Sintering Assisted by ZnO and CoO Addition**  
**L.A. VILLA-BOAS**, D.P.F. DE SOUZA, F.M.L. FIGUEIREDO, F.M.B. MARQUES, Dept. of Materials Eng., PPGCEM/UFSCAR, Sao Carlos, Brazil; Dept. of Materials & Ceramic Eng., CICECO, University of Aveiro, Aveiro, Portugal

**FA:P09 Utilization of a Protective Layer for Solid Oxide Fuel Cell Directly Fed with Ethanol**  
**R.M. REIS**<sup>1</sup>, G.G.A. SAGLIETTI<sup>1</sup>, M. LO FARO<sup>2</sup>, A.S. ARICO<sup>2</sup>, E.A. TICIANELLI<sup>1</sup>, <sup>1</sup>USP-IQSC, Sao Carlos, SP, Brasil; <sup>2</sup>CNR-ITAE, Messina, Italy

**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:P11 Gd-doped Ceria / Li-Na Carbonate Composite: Correlation between Microstructure and Electrical Conductivity**  
**E.C. GRZEBIELUCKA**, D.P.F. DE SOUZA, Department of Materials Engineering, Federal University of S. Carlos, S. Carlos-SP, Brazil

**FA:P12 Polarization Studies of a Novel Fe/ BaCe<sub>0.5</sub>Zr<sub>0.3</sub>Y<sub>0.08</sub>Yb<sub>0.08</sub> Cu<sub>0.04</sub>O<sub>3-δ</sub> /Fe Proton Conducting Solid Electrolyte at Intermediate Temperatures**  
**S. MITRI**<sup>1</sup>, D. MEDVEDEV<sup>2</sup>, A. DEMIN<sup>2</sup>, P. TSIKARAS<sup>1</sup>, <sup>1</sup>Department of Mechanical Engineering, School of Engineering, University of Thessaly, Pedion Areos, Volos, Greece; <sup>2</sup>Institute of High Temperature Electrochemistry, Yekaterinburg, Russia

**FA:P13 Compatibility Studies of Ln<sub>2</sub>NiO<sub>4</sub>+s Cathodes with BaCe<sub>0.65</sub>Zr<sub>0.20</sub>Y<sub>0.15</sub>O<sub>3-d</sub> for PCFC Applications**  
**C. MORTALO**<sup>1</sup>, S. FASOLIN<sup>1</sup>, S. BOLDRINI<sup>1</sup>, S. BARISON<sup>1</sup>, P. BATOCCHI<sup>2</sup>, S. FOURCADE<sup>2</sup>, F. MAUVY<sup>2</sup>, <sup>1</sup>CNR-IENI, Padova, Italy; <sup>2</sup>ICMCB-CNRS, Pessac Cedex, France

**FA:P14 Electrical and Electrochemical Properties of La<sub>2-x</sub>CaxNiO<sub>4</sub> and La<sub>2-x</sub>CaxNiO<sub>4</sub>-Ce<sub>0.8</sub>Sm<sub>0.2</sub>O<sub>1.9</sub> as Cathode Materials for Intermediate Temperature SOFCs**  
**E.Yu. PIKALOVA**<sup>1</sup>, A.A. KOLCHUGIN<sup>1,2</sup>, N.M. BOGDANOVICH<sup>1</sup>, D.I. BRONIN<sup>1</sup>, <sup>1</sup>Institute of High Temperature Electrochemistry, UB RAS, Yekaterinburg, Russia; <sup>2</sup>Vitus 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'EIFANIO, **B. MECHERI**, A. IANNACI, S. LICOCCHIA, 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 BONIS**<sup>1</sup>, **A. D'EIFANIO**<sup>1</sup>, B. MECHERI<sup>1</sup>, D. COZZI<sup>1</sup>, I. NICOTERA<sup>2</sup>, S. LICOCCHIA<sup>1</sup>, <sup>1</sup>University of Rome Tor Vergata, Rome, Italy; <sup>2</sup>Department 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. TZORBATZOGLOU**, 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**<sup>1,2</sup>, R. NARDUCCI<sup>1,2</sup>, P. KNAUTH<sup>1</sup>, M.L. DI VONA<sup>2</sup>, <sup>1</sup>Aix Marseille Univ., UMR 7246, Marseille, France; <sup>2</sup>Univ. 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. TZORBATZOGLOU, 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-Ta<sub>2</sub>O<sub>5</sub> 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



SYMPOSIUM FB  
**HYDROGEN PRODUCTION AND  
STORAGE**

*Oral Presentations*

Session FB-1  
Hydrogen Production

**FB-1:IL01 Solar Fuels from H<sub>2</sub>O and CO<sub>2</sub> via Thermochemical Redox Cycles with Ceria Foams**

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

**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. OHAYRE, J. TONG, Colorado School of Mines, CO, USA

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

**H. MIYAOKA**<sup>1</sup>, T. ICHIKAWA<sup>2</sup>, Y. KOJIMA<sup>2</sup>, <sup>1</sup>Institute for Sustainable Sciences and Development, Hiroshima University, Higashi-Hiroshima, Japan; <sup>2</sup>Institute for Advanced Materials Research, Hiroshima University, Higashi-Hiroshima, Japan

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

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

**FB-1:IL05 Hydrogen Interaction with Alkaline-doped Fullerenes**

**R. ZIDAN**, Savannah River National Lab., Aiken, SC, USA

**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

**FB-1:L07 Ceria Based Materials with Enhanced OSC Properties for H<sub>2</sub> Production by Water Splitting Reaction**

**A. PAPPACENA**, M. BOARO, L. BARDINI, A. TROVARELLI, Università degli Studi di Udine, Udine, Italy

**FB-1:IL08 Efficient Solar Water Splitting with a BiVO<sub>4</sub>-Based Hetero-junction Photoanode**

**R. VAN DE KROL**, F.F. ABDI, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Institute for Solar Fuels, Berlin, Germany

**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

**FB-1:L10 TiS<sub>x</sub> Nanoribbons: Hydrogen Storage and Photoelectrochemical Properties**

**M. BARAWI MORAN**<sup>1</sup>, M. PONTHEU<sup>2</sup>, J.R. ARES<sup>1</sup>, F. CUEVAS<sup>2</sup>, I.J. FERRER<sup>1</sup>, J.F. FERNÁNDEZ<sup>1</sup>, C. SÁNCHEZ<sup>1</sup>, <sup>1</sup>Grupo MIRE, Dpto. Física de Materiales, Facultad de Ciencias, Universidad Autónoma de Madrid, Madrid, Spain; <sup>2</sup>Equipe de Chimie Métallurgique des Terres Rares (CMTR) Institut de Chimie et des Matériaux, Paris Est (ICMPE) CNRS-UMR 7182, Thiais Cedex, France

**FB-1:L11 Electrodeposition of Metallic Foams and their Application as Catalyst for Hydrogen Production**

**S. EUGENIO**, ICEMS-Instituto Superior Tecnico, University of Lisbon, Lisbon, Portugal; U.B. DEMIRCI, Université Montpellier 2, Institut Européen des Membranes, Montpellier, France; M.J. CARMEZIM, ICEMS and Department of Mechanical Engineering, ESTSetubal, Instituto Politecnico de Setubal, Setubal, Portugal; T.M. SILVA, Department of Mechanical Engineering, Instituto Superior de Engenharia de Lisboa, Lisbon, Portugal; M.F. MONTEMOR, ICEMS and Department of Chemical Engineering, Instituto Superior Tecnico, University of Lisbon, Lisbon, Portugal

**FB-1:L12 A Novel High Temperature Electrolysis Process for Producing Hydrogen In Molten Alkali Carbonates: Preliminary Evaluation Studies**

**S. FRANGINI**, P. TARQUINI, C. FELICI, ENEA CR Casaccia, UTRINN, Rome, Italy

Session FB-2  
Hydrogen Storage

*FB-2.1 Metal Hydrides*

**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

**FB-2.1:IL02 Thermodynamics of the Hydrogen Interaction with Nano-sized Metals**

**R. GRIESSEN**, Amsterdam University College and VU University, Amsterdam, The Netherlands

**FB-2.1:L03 Metal Hydrides for Hydrogen Storage and Production**

**M. SAHLBERG**, Department of Chemistry - Angstrom Laboratory, Uppsala University, Uppsala, Sweden

**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

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

A. AYDINLI<sup>1</sup>, B. AKTEKIN<sup>1</sup>, S. TAN<sup>2</sup>, G. ÇAKMAK<sup>3</sup>, T. ÖZTÜRK<sup>1</sup>, <sup>1</sup>Middle East Technical University, Ankara; <sup>2</sup>Akdeniz University, Antalya; <sup>3</sup>Bulent Ecevit University, Zonguldak, Turkey

**FB-2.1:IL06 Investigating the Reaction Pathways when Cycling Multi-component Metal Hydride Systems**

**G.S. WALKER**, Energy and Sustainability Research Division, University of Nottingham, Nottingham, UK

**FB-2.1:IL07 Hydrogen Storage Properties of Mg-based Materials**

**E. AKIBA**, J. MATSUDA, International Institute for Carbon-Neutral Energy Research, Fukuoka, Japan

**FB-2.1:L08 Electrochemical and Solid/Gas Investigation of Nb<sub>4</sub>MSi (M=Co, Ni) Hydrides**

**J. ANGSTROM**, M. SAHLBERG, Dept. of Chemistry, Angström Laboratory, Uppsala Universitet, Uppsala, Sweden

**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

**FB-2.1:L10 Cyclability of Compacted MgH<sub>2</sub> 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

**FB-2.1:L11 Hydrogenation Properties of Zirconium-doped TiFe and TiFe<sub>0.9</sub>Mn<sub>0.1</sub> Alloys**

**J. HUOT**, C. GOSELIN, P. JAIN, Université du Québec a Trois-Rivières, Canada; J. ECKSTEIN, Helmut Schmidt University, Germany

*FB-2.2 Complex Hydrides*

**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

**FB-2.2:L02 Role of Gas Back Pressure in Dehydrogenation Reaction of LiBH<sub>4</sub>-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

**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

**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

**FB-2.2:IL05 Improved Dehydrogenation Properties of the Mg(NH<sub>2</sub>)<sub>2</sub>-2LiH System**

H.J. CAO, J.H. WANG, Z.T. XIONG, G.T. WU, **PING CHEN**, Dalian Institute of Chemical Physics (CAS), Dalian, China

**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

**FB-2.2:IL07 Interface Reactions Influences the Reaction Path of Hydride Composite**  
**A. BORGSCULTE**, S. KATO, A. ZÜTTEL, Empa, Laboratory Hydrogen & Energy, Dübendorf, Switzerland

### FB-2.3 Chemical Hydrides

**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

**FB-2.3:IL02 The Role of Nanotechnology in Hydrogen Storage**  
 ZIWEI TANG, GUANGLIN XIA, **XUEBIN YU**, Department of Materials Science, Fudan University, Shanghai, China

**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

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

**FB-2.4:IL01 Nanoconfined Complex Metal Hydrides**  
**PE. DE JONGH**, Inorganic Chemistry and Catalysis, Debye Institute for Nanomaterials Science, Utrecht University, Utrecht, The Netherlands

**FB-2.4:IL02 New Approaches to Enhance Hydrogen Storage in MOFs**  
**PN. TRIKALITIS**, Department of Chemistry, University of Crete, Heraklion, Greece

**FB-2.4:L03 Cycling, Kinetic and Structural Hydrogenation Properties of MgH<sub>2</sub>-TiH<sub>2</sub> 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

**FB-2.4:L04 Hydrogen Storage Properties of Decorated Fullerides**  
**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

**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

**FB-2.4:L06 Hydrogen Adsorption at High Pressure in Carbon Nanostructures: Equilibrium and Kinetic Properties**  
**R.G. AGOSTINO**, E. MACCALLINI, A. POLICICCHIO, F. MINUTO, CNISM-Dipartimento di Fisica, Università della Calabria, Ponte Bucci, Arcavacata di Rende (CS), Italy; E.K. DIAMANTI, A. ENOTIADIS, D. GOURNIS, Department of Materials Science and Engineering, University of Ioannina, Ioannina, Greece; R.Y.N. GENGLER, P. RUDOLF, Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands; T.A. STEROTIS, Institute of Physical Chemistry, NCSR Demokritos, A. Paraskevi-Attikis, Athens, Greece; G.K. DIMITRAKAKIS, E. TYLIANAKIS, PN. TRIKALITIS, G. FROUDAKIS, Department of Chemistry, University of Crete, Heraklion, Greece; L. ULIVI, M. CELLI, ISC-CNR, Sesto Fiorentino (FI), Italy

**FB-2.4:IL07 A New Approach to Store Hydrogen in Glass Structures: Theory and Application**  
**D. ELIEZER**, C.En Ltd, Zurich, Switzerland; K. HOLTAPPELS, BAM, Berlin, Germany

**FB-2.4:IL08 Hydrogen Storage in Metal-organic Frameworks**  
**MYUNGHYUN PAIK SUH**, Department of Chemistry, Seoul National University, Seoul, Republic of Korea

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

**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

**FB-2.5:L02 Thermodynamic Modelling of Borohydrides for Hydrogen STORAGE**  
 E.R. PINATEL, E. ALBANESE, B. CIVALLERI, **M. BARICCO**, Dipartimento di Chimica and NIS, Università di Torino, Torino, Italy

**FB-2.5:L03 Study of Hydrogen Effects on the Electron Density Distribution using MEM**

**SEUNGHUN LEE**, The Institute of Basic Science, Korea University, Seoul, Republic of Korea; J.H. PARK, B.-S. KIM, Y.C. CHO, S.-Y. JEONG, Dept. of Cogno-Mechatronics Engineering, Pusan National University, Miryang, Republic of Korea; C. MORIYOSHI, Y. KUROIWA, Dept. of Physical Science, Hiroshima University, Higashi-Hiroshima, Japan; C.H. PARK, Dept. of Physical Education, Pusan National University, Busan, Republic of Korea

**FB-2.5:L04 Theoretical Study of the SmCo<sub>5</sub>H<sub>x</sub> Compounds: Cohesive and Magnetic Properties**

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

**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

**FB-2.5:IL06 Nanomaterials for Hydrogen Storage**

**P. JENA**, Virginia Commonwealth University, Richmond, VA, USA

**FB-2.5:L08 Computational Search for Improved Ammonia Storage Materials**

**PB. JENSEN**, S. LYSGAARD, T. VEGGE, DTU Energy Conversion, Technical University of Denmark, Kgs. Lyngby, Denmark; U. QUADE, Amminex Emissions Technology, Søborg, Denmark

**FB-2.5:L09 Novel FIB-SEM Methodologies for 3D Nanostructuring and Nanoanalysis of Hydrogen Storage Materials**

**M. SEZEN**<sup>1</sup>, F. BAKAN<sup>1</sup>, M.A. GULGUN<sup>2</sup>, E. RABKIN<sup>3</sup>, <sup>1</sup>Sabancı University Nanotechnology Research and Application Center, Orhanli-Tuzla, Istanbul, Turkey; <sup>2</sup>Sabancı University; Faculty of Engineering and Natural Sciences; Orhanli-Tuzla, Istanbul, Turkey; <sup>3</sup>Department of Materials Science and Engineering, Technion, Haifa, Israel

**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. BOELSMAN, B. DAM, Materials for Energy Conversion and Storage (MECS), Faculty of Applied Sciences, Dept. Chemical Engineering, Delft University of Technology, Delft, The Netherlands

### Poster Presentations

**FB:P01 The Effect of Doping of Fe into TiO<sub>2</sub> Layer in Fe<sub>2</sub>O<sub>3</sub>/TiO<sub>2</sub>/FTO System for High Performance of Water Splitting**

**A. AZAD**<sup>1</sup>, EUL NOH<sup>1</sup>, HYU JIN OH<sup>1</sup>, BO RA KIM<sup>1</sup>, KANG SEOP YUN<sup>1</sup>, HEE JUNE JEONG<sup>1</sup>, WOO SEUNG KANG<sup>2</sup>, SANG CHUL JUNG<sup>3</sup>, SUN JAE KIM<sup>1</sup>, <sup>1</sup>Institute/Faculty of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, Korea; <sup>2</sup>Dept. of Metallurgical & Materials Engineering, Inha Technical College, Incheon, Korea; <sup>3</sup>Dept. of Environmental Engineering, Suncheon 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 Rhodospirillum rubrum**

**R. ZAGRODNIK**, K. SEIFERT, K. DYBA, 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:P10 On the Rate Limiting Step of MgH<sub>2</sub> Desorption**

**Lj. MATOVIC**, S. KURKO, Z. RASKOVIC-LOVRE, S. MILOSEVIC, I. MILANOVIC, A. DJUKIC, R. VUJASIN, J. GRBOVIC NOVAKOVIC, Vinca Institute of Nuclear Sciences, Belgrade, Serbia

**FB:P11 Hydrogen Sorption Cycling Behaviour of MgH<sub>2</sub> Powders and Pellets**

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

**FB:P12 Hexagonal Prism MIL-101 Monoliths for Improved Hydrogen Storage in the Range of 77-157 K**

**G. BLANITA**, I. COLDEA, I. MISAN, D. LUPU, National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania

**FB:P13 Electronic Principles of H Diffusion Behavior in Doped MgH<sub>2</sub>**

**B. PASKAS MAMULA**, S. KURKO, **N. IVANOVIC**, J. GRBOVIC NOVAKOVIC, N. NOVAKOVIC, VINCA Institute for Nuclear Sciences, University of Belgrade, Belgrade, Serbia

**FB:P14 Hydrogen Technologies and Applications: Safety**

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

## SYMPOSIUM FC

**ELECTROCHEMICAL ENERGY  
STORAGE SYSTEMS:  
THE NEXT EVOLUTION**

## Oral Presentations

Session FC-1  
Batteries

**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

**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

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

**C. FRAYRET**<sup>1</sup>, D. TOMERINI<sup>1</sup>, C. GATTI<sup>2</sup>, Y. DANTEN<sup>3</sup>, M. BECUWE<sup>1</sup>, F. DOLHEM<sup>4</sup>, P. POIZOT<sup>5</sup>, <sup>1</sup>LRCS-CNRS UMR 7314, Université de Picardie, Amiens, France; <sup>2</sup>CNR-ISTM, Istituto di Scienze e Tecnologie Molecolari, Milano, Italy; <sup>3</sup>ISM-CNRS UMR 5255, Talence, France; <sup>4</sup>LG-CNRS-FRE 3517, Université de Picardie, Amiens, France; <sup>5</sup>IMN-CNRS UMR\_C 6502, Université de Nantes, Nantes, France

**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

**FC-1:L05 Monitoring Volume Change and Crack Formation Using 2D and 3D in Situ X-ray Microscopy of Germanium Anodes**

**J. NELSON WEKER**<sup>1</sup>, N. LIU<sup>2</sup>, J.C. ANDREWS<sup>1</sup>, Y. CUI<sup>2</sup>, M.F. TONEY<sup>1</sup>, <sup>1</sup>Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory, Menlo Park, CA, USA; <sup>2</sup>Stanford University, Stanford, CA, USA

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

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

**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

**FC-1:L08 Local Structure of Lithium Orthosilicates Li<sub>2</sub>MSiO<sub>4</sub> (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

**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, Department of Industrial Engineering (DIN), Bologna, Italy; **D. FABIANI**, M. ZACCARIA, Alma Mater Studiorum - Università di Bologna, Electric, Electronic and Information Engineering Department (DEI), Bologna, Italy; **M.L. FOCARETE**, C. GUALANDI, Alma Mater Studiorum - Università di Bologna, "G. Ciamician" Chemistry Department, Bologna, Italy

**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

**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

**FC-1:L12 Concurrent Formation of LiCoO<sub>2</sub> Crystal / Li-B-O Glass Composite Layer onto a Pt Substrate by Glass-Flux-Coating**

**Y. MIZUNO**<sup>1</sup>, N. ZETTSU<sup>1,2</sup>, T. SAKAGUCHI<sup>3</sup>, T. SAITO<sup>3</sup>, H. WAGATA<sup>1,2</sup>, S. OISHI<sup>1</sup>, K. TESHIMA<sup>1,2</sup>; <sup>1</sup>Shinshu University, Nagano, Japan; <sup>2</sup>CREST, Japan Science and Technology Agency; <sup>3</sup>Toyota Motor Corporation, Japan

**FC-1:L13 Polymer-in-ceramic Solid Electrolyte for Li-ion Batteries**

**G. GOLODNITSKY**<sup>1,2</sup>, R. BLANGA<sup>1</sup>, K. FREEDMAN<sup>1</sup>, E. PELED<sup>1</sup>; <sup>1</sup>School of Chemistry; <sup>2</sup>Wolfson Applied Materials Research Center, Tel Aviv University, Tel Aviv, Israel

**FC-1:L14 Conducting Polymers as Effective Additives for Positive Electrodes in Li-ion Batteries Working at High Rates**

**P. JIMENEZ**<sup>1</sup>, B. LESTRIEZ<sup>1</sup>, J.-P. BONNET<sup>2</sup>, P. BLANCHARD<sup>3</sup>, J.-C. BADOT<sup>4</sup>, O. DUBRUNFAUT<sup>5</sup>, D. GUYOMARD<sup>1</sup>, J. GAUBICHER<sup>1</sup>, Réseau sur le Stockage Electrochimique de l'Energie (RS2E), FR CNRS 3459, France; <sup>1</sup>Institut des Matériaux Jean Rouxel (IMN), Université de Nantes, CNRS, Nantes, France; <sup>2</sup>Lab. réactivité et chimie des solides (LRCS), CNRS UMR7314, Université de Picardie J. Verne, Amiens, France; <sup>3</sup>Lab. MOLTECH-Anjou, CNRS UMR6200, Université de Angers, Angers, France; <sup>4</sup>Institut de Recherche de Chimie Paris, CNRS UMR 8247, Chimie ParisTech, Paris, France; <sup>5</sup>Lab. de Génie Electrique de Paris, CNRS UMR 8507, SUPELEC, Sorbonne; Universités, UPMC Univ Paris 06, Univ Paris-Sud, Gif-sur-Yvette, France

**FC-1:IL15 Novel Electrode Materials for Rechargeable Batteries**

**D. GUYOMARD**<sup>1</sup>, L. ROUÉ<sup>2</sup>, M. CERBELAUD<sup>1</sup>, J. GAUBICHER<sup>1</sup>, N. DUPRÉ<sup>1</sup>, P. MOREAU<sup>1</sup>, B. LESTRIEZ<sup>1</sup>, <sup>1</sup>Institut des Matériaux Jean Rouxel (IMN), Université de Nantes, CNRS, Nantes, France; Réseau sur le Stockage Electrochimique de l'Energie (RS2E), FR CNRS 3459, France; <sup>2</sup>INRS-Energie, Matériaux et Télécommunications, Varennes Québec, Canada

**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

**FC-1:L17 Effects of Heat-treating Temperature on the Properties of LiMn<sub>1.5</sub>Ni<sub>0.5</sub>O<sub>4</sub> 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

**FC-1:L18 Hydrothermal Synthesis of Porous Spindle LiFePO<sub>4</sub> 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

**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



## Session FC-2 Supercapacitors

### FC-1:IL21 Mesoporous TiO<sub>2</sub> as an Alternative Anode for Fast Chargeable Lithium-ion Battery

**P. BALAYA**, National University of Singapore, Singapore

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

**J. SAKAMOTO**<sup>1</sup>, T. THOMPSON<sup>1</sup>, M. JOHANNES<sup>2</sup>, A. HUO<sup>3</sup>, J. ALLEN<sup>4</sup>, J. WOLFENSTINE<sup>4</sup>, I.N. DAVID<sup>1</sup>, <sup>1</sup>Michigan State University, Chemical Engineering and Materials Science Department, East Lansing, MI, USA; <sup>2</sup>Naval Research Laboratory/Center for Computational Materials Science, Anacostia, VA, USA; <sup>3</sup>Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, USA; <sup>4</sup>Army Research Laboratory, RDRL-SED-C, Adelphi, MD, USA

### FC-1:IL23 Capacity Enhancement of Graphite Anodes by Surface Modification and Thermal Pre-treatment

**S. BHATTACHARYA**, A.R. RIAHI, **A.T. ALPAS**, Engineering Materials Program, University of Windsor, Ontario, Canada

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

**C. DELMAS**<sup>1</sup>, H. KOGA<sup>1,2</sup>, L. CROGUENNEC<sup>1</sup>, M. MÉNÉTRIER<sup>1</sup>, S. BELIN<sup>3</sup>, C. GENEVOIS<sup>4</sup>, L. BOURGEOIS<sup>5</sup>, F. WEILL<sup>1</sup>, <sup>1</sup>ICMCB-CNRS, Université de Bordeaux, IPB-ENSCBP, Pessac cedex, France; <sup>2</sup>TOYOTA MOTOR EUROPE NV/SA, Zaventem, Belgium; <sup>3</sup>Synchrotron Soleil - L'orme des Merisiers Saint Aubin, Gif-sur-Yvette, France; <sup>4</sup>GPM, Université de Rouen, Saint Etienne du Rouvray; <sup>5</sup>Université de Bordeaux, ISM, Talence, France

### FC-1:IL25 Lithium-ion Batteries: Cell Design, Production and Performance

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

### FC-1:IL26 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

### FC-1:IL27 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

### FC-1:IL28 Mussel-inspired Catechol Batteries

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

### FC-1:IL28b Amorphous Silicon Nanoparticles Synthesized by Inductive Coupled Plasma for Secondary Lithium-ion Battery

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

### 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

### 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 (IMRAM), Tohoku University, Sendai, Japan; M.S. MICHAEL, Chemical Sciences Research Centre, SSN College of Engineering, SSN Nagar, Chennai, India

### FC-1:IL31 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

### 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

### FC-1:IL34 A New Fabrication Route for High-quality Crystal Layers of Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> directly on a Current Collector as well as their All-solid-state Lithium Ion Battery Properties

**N. ZETTSU**<sup>1,2</sup>, H. KOJIMA<sup>1</sup>, S. NOZAKI<sup>1</sup>, K. TESHIMA<sup>1,2</sup>, <sup>1</sup>Shinshu University, Nagano, Japan; <sup>2</sup>CREST, Japan Society and Technological Agency

### 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

### FC-2:IL02 New Generation Hybrid Supercapacitors and Future Perspectives

**K. NAOI**<sup>1</sup>, W. NAOI<sup>2</sup>, <sup>1</sup>Dept. of Appl. Chem., Tokyo Univ. of Agriculture & Technology, Tokyo, Japan; <sup>2</sup>Div. of Art & Innovative Tech., K & W Inc, Tokyo, Japan

### 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

### FC-2:IL04 Lithium Vanadium Phosphate in High Power Devices

**A. BALDUCCI**, N. BÖCKENFELD, X. ZHANG, University of Münster, Institut of Physical Chemistry-MEET / Münster, Germany

### FC-2:IL05 Effect of Cation on Diffusion Coefficient of Ionic Liquids at Onion-like Carbon Electrodes

**K. VAN AKEN**<sup>1</sup>, J.K. MCDONOUGH<sup>1</sup>, SONG LI<sup>2</sup>, GUANG FENG<sup>2</sup>, S.M. CHATHOTH<sup>3,5</sup>, É. MAMONTOV<sup>3</sup>, P.F. FULVIO<sup>4</sup>, P.T. CUMMINGS<sup>2</sup>, SHENG DAI<sup>4</sup>, Y. GOGOTSI<sup>1</sup>, <sup>1</sup>Department of Materials Science and Engineering & A.J. Drexel Nanotechnology Institute, Drexel University, Philadelphia, PA, USA; <sup>2</sup>Department of Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, USA; <sup>3</sup>Chemical and Engineering Materials Division, Neutron Sciences Directorate, Oak Ridge National Laboratory, Oak Ridge, TN, USA; <sup>4</sup>Chemical Science Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA; <sup>5</sup>Department of Physics and Materials Science, City University of Hong Kong, Hong Kong, China

### FC-2:IL06 Sol-gel Thermolysis Synthesis of LiMnPO<sub>4</sub> for Pseudocapacitor Electrodes

**N. PRIYADHARSINI**<sup>1,2</sup>, R. KALAI SELVAN<sup>1</sup>, <sup>1</sup>Solid State Ionics and Energy Devices Laboratory, Department of Physics, Bharathiar University, Coimbatore, Tamil Nadu, India; <sup>2</sup>Department of Physics, PSGR Krishnammal College for Women, Peelamedu, Coimbatore, Tamil Nadu, India

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

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

### 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

### FC-2:IL09 Improving the Energy Density of Electrochemical Capacitors: From Pseudocapacitive 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

### FC-2:IL10 Economic and Ecological Life Cycle Assessment of New Materials for Supercapacitors and Batteries

**M. WEIL**<sup>1,2</sup>, H. DURA<sup>1</sup>, M. BAUMANN<sup>1</sup>, B. ZIMMERMANN<sup>1</sup>, B. SIMON<sup>2</sup>, S. ZIEMANN<sup>1</sup>, G.R. GARCIA<sup>2</sup>, <sup>1</sup>Institute for Technology Assessment and System Analysis (ITAS), Karlsruhe Institute of Technology (KIT), Germany; <sup>2</sup>Helmholtz Institute Ulm for Electrochemical Energy Storage (HIU), Karlsruhe Institute of Technology (KIT), Germany

### FC-2:IL11 Li-Ion Hybrid Capacitors Based on Monolayer Carbon Caged Nanoporous LiMnPO<sub>4</sub>

**M.S. MICHAEL**, Chemical Science Research Lab, SSN College of Engineering, Anna University affiliate, Chennai, India

### FC-2:IL12 Hybrids of 2D-nanomaterials for Supercapacitors/Battery Applications

**B. MENDOZA SANCHEZ**, J. COELHO, S. O'BRIEN, H. PETERSSON, V. NICOLOSI, CRANN, Trinity College Dublin, Dublin, Republic of Ireland

## Poster Presentations

**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. OSTERS, L. KOMSIYSKA, NEXT ENERGY . EWE Research Centre for Energy Technology at the University of Oldenburg, Oldenburg, Germany

**FC:P03 Synthesis and Properties of LiFePO<sub>4</sub>/C Cathode Materials prepared from Iron Phosphate Modified by V<sub>2</sub>O<sub>5</sub>**

**MOBINUL ISLAM**<sup>2</sup>, **MAN-SOON YOON**<sup>1</sup>, **SOON-CHUL UR**<sup>1</sup>, <sup>1</sup>Department of Materials Science and Engineering/Research Center for Sustainable Eco-Devices and Materials (ReSEM), Korea National University of Transportation, Chungju, Chungbuk, Republic of Korea; <sup>2</sup>Green 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. OSTERS, 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-V<sub>2</sub>O<sub>5</sub> based Core Shell Particles for Application as Cathode Material in Lithium Ion Batteries**

**L. KOMSIYSKA**, D. LEDWOCH, E. HAMMER, K. REINKEN, **O. OSTERS**, 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<sup>+</sup>-conductive Oxides**

**S. KOMINE**<sup>1</sup>, Y. SATO<sup>1</sup>, S. SUZUKI<sup>1</sup>, K. KAMI<sup>1</sup>, N. ZETTSU<sup>2,3</sup>, K. TESHIMA<sup>2,3</sup>, <sup>1</sup>DENSO CORPORATION, Agui-cho, Chita-gun, Aichi, Japan; <sup>2</sup>Shinshu University, Nagano, Japan; <sup>3</sup>CREST, Japan Society and Technological Agency

**FC:P09 Development of Fine Microstructured Sodium-Beta"-Alumina Electrolytes**

**D.C. RODRIGUES**, PI. PAULIN FILHO, D.PF. DE SOUZA, Federal University of S. Carlos, S. Carlos, S. Paulo, Brazil

**FC:P10 Homogeneous Microstructure of Na-beta/beta" Obtained from Nanopowders**

**J.F. NONEMACHER**, D.PF. DE SOUZA, Federal University of Sao Carlos, Sao Carlos, Sao Paulo, Brazil

**FC:P11 Lithium Migration at TiO<sub>2</sub> Interfaces: A 3D Approach**

**T.C. PEIXOTO**<sup>1</sup>, M.E.G. VALERIO<sup>1</sup>, S.C. PARKER<sup>2</sup>, **C. ARROUVEL**<sup>3</sup>, <sup>1</sup>DFI, Universidade Federal de Sergipe, SE, Brazil; <sup>2</sup>Department of Chemistry, University of Bath, UK; <sup>3</sup>DFQM Universidade Federal de São Carlos, SP, Brazil

**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/MnO<sub>2</sub> as New Electrode Material for Supercapacitor**

**A. BAHLOUL**<sup>1,2</sup>, B. NESSARK<sup>1</sup>, E. BRIOT<sup>2</sup>, H. GROULT<sup>2</sup>, A. MAUGER<sup>3</sup>, K. ZAGHIB<sup>4</sup>, C.M. JULIEN<sup>2</sup>, <sup>1</sup>Université Ferhat Abbas, Laboratoire d'Electrochimie et Matériaux, Sétif, Algeria; <sup>2</sup>Université Pierre et Marie Curie, PECSA, UMR 7195, Bat. F, Paris, France; <sup>3</sup>Université Pierre et Marie Curie, IMPMC, Paris, France; <sup>4</sup>Energy Storage and Conversion, Research Institute of Hydro-Québec, Varennes, Québec, Canada

**FC:P16 V<sub>2</sub>O<sub>5</sub> Nanostrips Grown over Graphene Oxide for High Performance Electrochemical Capacitor**

**V. SAHU**, S. GROVER, G. SINGH, R. KISHORE, Sharma University of Delhi, Department of Chemistry, Delhi, India

**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

## Oral Presentations

## Session FD-1

### Theoretical Concepts and Basic Approaches for High Efficiency Thermal-to-electrical Energy Conversion

**FD-1:IL01 A Search for Nonequilibrium Thermoelectrics**

**I. TERASAKI**, Department of Physics, Nagoya University, Nagoya, Japan

**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

**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

**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

**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

**FD-1:IL06 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

**FD-1:IL07 Nanostructured Cadmium Sulfide Thin Film Structural, Optical and Electrical Characterization**

**A.S.Z. LAHEWIL**<sup>1,4</sup>, U. HASHIM<sup>1</sup>, M. KASHIF<sup>1</sup>, S.M. ELSARITI<sup>2</sup>, N.M. AHMED<sup>3</sup>, A.S.Z. LAHEEW<sup>5</sup>, <sup>1</sup>Institute of Nano Electronic Engineering, University Malaysia Perlis, Kangar, Perlis, Malaysia; <sup>2</sup>Mechatronic Engineering, University Malaysia Perlis, Ulu Pauh, Perlis, Malaysia; <sup>3</sup>School of Physics, Universiti Sains Malaysia, USM, Penang, Malaysia; <sup>4</sup>The Higher Vocational Center for Trainers/Tripoli, Libya; <sup>5</sup>School of Materials Engineering University Malaises Perlis, Jejawi, Perlis, Malaysia

## Session FD-2

### Novel Materials for High Efficiency Thermal-to-electrical Energy Conversion

**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

**FD-2:IL02 Enhanced zT in Fe and Te Substituted Co<sub>4</sub>Sb<sub>12</sub> Skutterdite**

**R.C. MALLIK**<sup>1</sup>, R. ANBALAGAN<sup>1</sup>, G. ROGL<sup>2</sup>, E. ROYANIAN<sup>3</sup>, P. HEINRICH<sup>3</sup>, E. BAUER<sup>3</sup>, P. ROGL<sup>2</sup>, S. SUWAS<sup>4</sup>, <sup>1</sup>Thermoelectric materials and Devices Laboratory, Department of Physics, Indian Institute of Science, Bangalore, India; <sup>2</sup>Institute of Solid State Physics, Vienna University of Technology, Vienna, Austria; <sup>3</sup>Institute of Physical Chemistry, University of Vienna, Austria; <sup>4</sup>Department of Materials Engineering, Indian Institute of Science, Bangalore

**FD-2:IL03 Borides as Thermoelectrics**

**TAKAO MORI**, National Institute for Materials Science (NIMS) & University of Tsukuba, Japan

**FD-2:IL04 Highly Efficient IV-VI Thermoelectric Materials**

**Y. GELBSTEIN**, Department of Materials Engineering, Ben-Gurion University, Beer-Sheva, Israel



**FD-2:IL05 High Performance Mg<sub>2</sub>(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

**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

**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

**FD-2:IL08 Stability, Structure and Properties of Sb<sub>2</sub>Te<sub>3</sub>-Bi<sub>2</sub>Te<sub>3</sub> Intergrowths and Superlattices**

**M. WINKLER**<sup>1</sup>, J. KÖNIG<sup>1</sup>, A.L. HANSEN<sup>2</sup>, T. DANKWORT<sup>3</sup>, J.D. KÖNIG<sup>1</sup>, H. BÖTTNER<sup>1</sup>, K. BARTHOLOMÉ<sup>1</sup>, W. BENSCH<sup>2</sup>, L. KIENLE<sup>3</sup>, <sup>1</sup>Fraunhofer Institute for Physical Measurement Techniques IPM, Thermoelectric Systems, Freiburg, Germany; <sup>2</sup>Institute of Inorganic Chemistry, Christian-Albrechts University Kiel, Kiel, Germany; <sup>3</sup>Institute for Materials Science, Synthesis and Real Structure, Christian-Albrechts University Kiel, Kiel, Germany

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

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

**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

**FD-2:IL11 Novel Approaches on the Design of Thermoelectric Materials for Power Generation**

**D.K. MISRA**, CSIR Network of Institutes for Solar Energy, Division of Materials Physics & Engineering, CSIR National Physical Laboratory, New Delhi, India

**FD-2:IL12 Thermoelectric Properties of Lead Tin Telluride (Pb<sub>1-x</sub>MnxSnyTe)Alloys Doped with Manganese**

**A. BALI**, R.C. MALLIK, Department of Physics, Indian Institute of Science, Bangalore, India; J. DADDA, J. DE BOOR, E. MUELLER, Institute of Materials Research, German Aerospace Center (DLR), Cologne, Germany

**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

**FD-2:IL14 Development of High ZT Skutterudites for Thermoelectric Applications**

**G. ROGL**<sup>1,2</sup>, A. GRYSIV<sup>1</sup>, E. BAUER<sup>1</sup>, M. ZEHETBAUER<sup>2</sup>, P. ROGL<sup>1</sup>, <sup>1</sup>Christian Doppler Laboratory for Thermoelectrics, University of Vienna, Austria; <sup>2</sup>Research Group Physics of Nanostructured Materials, University of Vienna, Austria

**FD-2:IL15 Lithium as a Dopant for p-type Mg<sub>2</sub>Si**

**P. NIERODA**<sup>1</sup>, A. KOLEZYNSKI<sup>2</sup>, M. SITARZ<sup>2</sup>, K.T. WOJCIECHOWSKI<sup>1</sup>, <sup>1,2</sup>AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland; <sup>1</sup>Department of Inorganic Chemistry, Thermoelectric Research Laboratory, <sup>2</sup>Department of Silicate Chemistry and Macromolecular Compounds

**FD-2:IL16 Nb-doped SrTiO<sub>3</sub> Thermoelectric Nanocomposite**

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

**FD-2:IL17 Tuning Thermoelectric Properties of TiS<sub>2</sub> Compounds through Intercalation, Mass Fluctuation, and Non-stoichiometry**

**E. GUILMEAU**<sup>1</sup>, M. BEAUMALE<sup>1</sup>, T. BARBIER<sup>1</sup>, O. LEBEDEV<sup>1</sup>, Y. BRÉARD<sup>1</sup>, S. HÉBERT<sup>1</sup>, Y. KINEMUCHI<sup>2</sup>, A. MAIGNAN<sup>1</sup>, <sup>1</sup>CRISMAT Lab., UMR 6508 CNRS-ENSICAEN, Caen, France; <sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), AIST Chubu, Nagoya, Japan

**FD-2:IL18 Phase Separation as the Key to Thermoelectric Highly Efficient Heusler Compounds**

**B. BALKE**, Johannes Gutenberg University, Mainz, Germany

**FD-2:IL19 Fine Bi Wires Prepared by the Glass Coated Melt Spinning Method**

**H. KOHRI**, T. YAGASAKI, Kogakuin University, Hachioji, Tokyo, Japan

**FD-2:L20 Temperature Influence on the Purity, Crystallographic Structure and Thermoelectric Properties of Cu<sub>12</sub>Sb<sub>4</sub>S<sub>13</sub> Substituted Tetrahedrite Compounds**

**P. LEMOINE**, T. BARBIER, S. GASCOIN, O. LEBEDEV, E. GUILMEAU, CRISMAT Laboratory, ENSICAEN-CNRS UMR 6508, Caen Cedex, France; A. KALTZOGLU, A. POWELL, University of Reading, Reading, UK

**FD-2:L21 Targeted Use of SPS Method for Improvement of Thermoelectrics**

**L.P. BULAT**, I.A. NEFEDOVA, National Research University ITMO, St. Petersburg, Russia

**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

**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

**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

**FD-2:L25 Application of Strong Gravitational Field for the Preparation of Gradient Thermoelectric Materials**

**K. JANUSZKO**, A. STABRAWA, K.T. WOJCIECHOWSKI, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Thermoelectric Research Laboratory, Cracow, Poland; Y. OGATA, T. MASHIMO, Kumamoto University, Shock Wave and Condensed Matter Research Center, Kumamoto, Japan

## Session FD-3

## Devices Technologies and Applications for Thermoelectrics, Thermionics, and Thermophotovoltaics

**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

**FD-3:IL02 Improving Efficiency of Thermoelectrics by Nanoengineering**

**M. MARTIN GONZALEZ**, O. CABALLERO CALERO, J. MAIZ, M. RULL, B. ABAD MAYOR, C.V. MANZANO, J.A. TABOARDA, M. MUÑOZ-ROJO, J.J. ROMERO-FANEGO, Funcional Nanoscale Devices for Energy Recovery Group -FINDER-, Instituto de Microelectrónica de Madrid IMM-CSIC, Tres Cantos (Madrid) Spain

**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

**FD-3:IL04 Nanotechnology to Unlock the Multi-billion Dollar Potential of Thermoelectricity**

**R.J. MEHTA**<sup>1</sup>, G. RAMANATH<sup>1,2</sup>, T. BORCA-TASCIUC<sup>1,2</sup>, R. FREDERICK<sup>1</sup>, <sup>1</sup>ThermoAura Inc., Rensselaer, NY, USA; <sup>2</sup>Rensselaer Polytechnic Institute, Troy, NY, USA

**FD-3:IL05 Development of Thermoelectric Generation for Waste Recovery**

**R. FUNAHASHI**, National Institute of Advanced Industrial Science and Technology, Ikeda, Osaka, Japan

**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

**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

**FD-3:L08 Preparation of Mg<sub>2</sub>Si 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

**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, ISTECC-CNR, Faenza (RA), Italy; R. YOGEV, A. KRIBUS, Tel Aviv University, Dept. of Mechanical Eng, Israel

## Poster Presentations

**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  $Mg_{2+x}Si_{0.7}Sn_{0.3}Sb_m$** 

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:P04 Effect of K Substitution on Type-I Clathrate  $KxBa_{8-x}Ga_{16-x}Ge_{30+x}$  ( $x=0-8$ )**

**J. LESZCZYNSKI**, A. KOLEZYNSKI, K.T. WOJCIECHOWSKI, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland; A. OLECH, W. NITEK, Jagiellonian University, Faculty of Chemistry, Krakow, Poland

**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

## SYMPOSIUM FE

**ADVANCES IN PHOTOCATALYTIC MATERIALS FOR ENERGY AND ENVIRONMENTAL SUSTAINABILITY**

## Oral Presentations

## Session FE-1

**Tailored Synthesis of Nanostructured Materials for Photofunctional Properties**

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

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

**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

**FE-1:L03 Environmentally Sustainable Synthesis of Nanoscale Photocatalysts**

**R.C. PULLAR<sup>1</sup>**, D.M. TOBALDI<sup>1</sup>, C. PICCIRILLO<sup>2</sup>, P. M.L. CASTRO<sup>2</sup>, M.P. SEABRA<sup>1</sup>, J.A. LABRINCHA<sup>1</sup>, <sup>1</sup>Department of Materials and Ceramic Engineering / CICECO, University of Aveiro, Campus Universitário de Santiago, Aveiro, Portugal; <sup>2</sup>CBQF / Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Porto, Portugal

**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

**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

**FE-1:IL06 Surface Modification of TiO<sub>2</sub> via Doping**

**Z. CINAR<sup>1</sup>**, Y.Y. GURKAN<sup>2</sup>, E. KASAPBAS<sup>3</sup>, <sup>1</sup>Yildiz Technical University, Department of Chemistry, Istanbul, Turkey; <sup>2</sup>Namik Kemal University, Department of Chemistry, Tekirdağ, Turkey; <sup>3</sup>Istanbul Aydin University, Department of Biomedical Eq.Tech., Istanbul, Turkey

**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 (DIECII), 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

**FE-1:L08 Characteristics of Nanocrystalline TiO<sub>2</sub> Films Fabricated by in Situ Sonochemical Sol Gel**

**E.A. ALARFAJ**, Umm AlQura University, Physics Department, Makkah AlMukarramah, Saudi Arabia

**FE-1:IL09 Nanostructured Photocatalysts for Solar Fuel Synthesis: Materials and Dynamics Studies**

**JUNWANG TANG**, Department of Chemical Engineering, University College London, London, UK

**FE-1:IL10 Sunlight-storing Heterojunction Electrodes for Nighttime Applications**

**HYUNWOONG PARK**, School of Energy Engineering, Kyungpook National University, Daegu, Korea

**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

**FE-1:L12 Photoelectrochemical Study of Anodized TiO<sub>2</sub> Nanotubes and Electrospun TiO<sub>2</sub> Fibres**

**D. REGONINI<sup>1</sup>**, A.C. TELOEKEN<sup>2</sup>, A.P. GARCIA<sup>2</sup>, A.K. ALVES<sup>2</sup>, A. BRAUN<sup>1</sup>, F. CLEMENS<sup>1</sup>, <sup>1</sup>Laboratory for High Performance Ceramics, EMPA-Swiss Federal Laboratories for Materials Science & Technology, Dübendorf, Switzerland; <sup>2</sup>Laboratory of Ceramic Materials, Federal University of Rio Grande do Sul, Porto Alegre, RS, Brazil

**FE-1:L13 Graphene Quantum Dot/Metal Oxide Nanocomposites with Enhanced Visible Light Photocatalytic Performance**

**RONG LI**, School of Materials and Engineering, Jiangsu University, Zhenjiang, P.R. China; XIAOFEI YANG, School of Materials and Engineering, Jiangsu University, Zhenjiang, P.R. China

**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

**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

**FE-1:L16 Low Temperature Deposition of Photocatalytic TiO<sub>2</sub> Coatings by Ink-jet Printing**

**P. LOMMENS**, J. WATTÉ, I. VAN DRIESSCHE, SCRIPTS, Department of Inorganic and Physical Chemistry, Ghent University, Ghent, Belgium

**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

**FE-1:L18 Photocatalytic Reduction of CO<sub>2</sub> into Solar Fuel Using Oxide-based Catalysts**

**TAO HE**, National Center for Nanoscience and Technology, Beijing, China

**FE-1:L19 Low Energy IR Photon Induced Photodegradation of Methyl Orange Using Ag<sub>2</sub>O/TiO<sub>2</sub> Nanocomposite Catalyst**

**A. GANNORUWA<sup>1,2</sup>**, A. MIHIRANI<sup>1</sup>, J. BANDARA<sup>1</sup>, <sup>1</sup>Institute of Fundamental Studies, Kandy, Sri Lanka; <sup>2</sup>Uva Wellassa University, Badulla, Sri Lanka

**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

**FE-1:L21 Enhanced Photocatalytic Activity over Ag<sub>2</sub>O/g-C<sub>3</sub>N<sub>4</sub> Composites under Visible Light**

**LEI SHI<sup>2</sup>**, LIN LIANG<sup>1,3</sup>, JUN MA<sup>1</sup>, **JIANMIN SUN<sup>1,2</sup>**, <sup>1</sup>State Key Laboratory of Urban Water Resource and Environment, Harbin Institute of Technology, Harbin, China; <sup>2</sup>The Academy of Fundamental and Interdisciplinary Science, Harbin Institute of Technology, Harbin, China; <sup>3</sup>School of Life Science and Technology, Harbin Institute of Technology, Harbin, China

## Session FE-3

## Design Approaches for Advanced Applications

**FE-1:L22 Preparation, Characterization and Photocatalytic Properties of Periodically Organized Mesoporous Titania Thin Film: Influence of Doping for Visible Light Activity**

S. SEMLALI<sup>1,2</sup>, T. PIGOT<sup>1</sup>, S. LACOMBE<sup>1</sup>, D. FLAHAUT<sup>1</sup>, L. NICOLE<sup>2</sup>, <sup>1</sup>IPREM-UMR CNRS 5254, Pau, France; <sup>2</sup>LCMCP, UMR CNRS 7574, Collège de France, France

**FE-1:L23 New UV and Visible Photocatalysts Prepared by a Microwave Assisted Approaches: from Better Knowledge to Better Efficiency**

O. DURUPHTY, F. DUFOUR, M.-A. LAVERGNE, S. PIGEOT-REMY, S. CASSAIGNON, C. CHANÉAC, LCMCP-UPMC, Paris, France; C. COLBEAU-JUSTIN, LCP-UPSud, France

**FE-1:L24 Flower-like TiO<sub>2</sub>/MoS<sub>2</sub> Nanocomposites for the Elimination of Organic Pollutants**

ZHEN JIANG, KANGMIN CHEN, XIAOFEI YANG, Jiangsu University, Zhenjiang, P.R. China

**FE-1:L25 Fe,Nb-doped BiOCl and its Photocatalytic Properties**

M. NUSSBAUM, N. SHAHAM-WALDMANN, Y. PAZ, Department of Chemical Engineering and the Russell-Berrie Nanotechnology Institute, Technion, Haifa, Israel

## Session FE-2

## Advances in Fundamental Mechanism Understanding

**FE-2:IL01 Fundamental Studies on Photocatalysis**

B. OHTANI, Hokkaido University, Sapporo, Japan

**FE-2:IL02 Nanocrystalline Transparent Photocatalytic Coatings: Mechanistic Aspects**

R. FATEH, D. BAHNEMANN, Leibniz University Hannover, Institute for Technical Chemistry, Hannover, Germany

**FE-2:IL03 Isotope Labeled Titania: Raman spectra, Photocatalysis and Electrochemistry**

L. KAVAN, J. Heyrovsky Institute of Physical Chemistry, Prague, Czech Republic

**FE-2:IL04 Effect of Ferroelectricity on Solar-Light-Driven Photocatalytic Activity of BaTiO<sub>3</sub> -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

**FE-2:IL05 Hydrogen-doping of Mesoporous TiO<sub>2</sub>: Characterization of Electronic States and Impact on Photocatalytic Performance**

T. BERGER<sup>1,2</sup>, J. IDIGORAS<sup>2</sup>, J.A. ANTA<sup>2</sup>, <sup>1</sup>Department of Materials Science and Physics, University of Salzburg, Salzburg, Austria; <sup>2</sup>Área de Química Física, Universidad Pablo de Olavide, Sevilla, Spain

**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, Dipartimento di Chimica, Università di Torino, Torino, Italy

**FE-2:IL07 Bimetallic PdxPt1-x/TiO<sub>2</sub> Photocatalysts for Enhanced Simultaneous Removal of CO and VOC in the Presence of Humidity: Structural and Electronic Effects**

O. ROSSELER<sup>1</sup>, A. LOUVET<sup>2</sup>, V. KELLER<sup>1</sup>, N. KELLER<sup>1</sup>, <sup>1</sup>Institut de Chimie et Procédés pour l'Energie, l'Environnement et la Santé (ICPEES), CNRS, University of Strasbourg, France; <sup>2</sup>Direction Générale de L'Armement (DGA), DGA CBRN Expertise, Vert-le-Petit, France

**FE-2:IL08 Resonant Light Trapping in Iron Oxide (Fe<sub>2</sub>O<sub>3</sub>) Ultrathin Film Photoanodes for Solar Powered Water Photoelectrolysis**

H. DOTAN, A. ROTHSCHILD, Department of Materials Science and Engineering Technion - Israel Institute of Technology, Haifa, Israel

**FE-2:IL09 Large Hydrogen Yields from Pristine Oxide Nanosheet Suspensions**

JIAN LIU, S.T. MISTURE, Alfred University, Alfred, NY USA

**FE-2:IL10 Photocatalytic Degradation Diesel of Soot: Unravelling the Reaction Mechanism**

M. SMITS, S. LENAERTS, Laboratory for Sustainable Energy and Air Purification, Department of Bioscience-engineering, University of Antwerp, Antwerp, Belgium; YUN LING, S. VAN DOORSLAER, Department of Physics, University of Antwerp, Antwerp, Belgium

**FE-3:IL01 Nanocrystal Self-assembly as a Route to Atomically Coherent 2-D Semiconductor Superlattices with Dirac-type Charge Carriers**

W.H. EVERS<sup>4</sup>, D. MITORAJ<sup>1</sup>, M. DIJKSTRA<sup>1</sup>, C. MORAIS-SMITH<sup>2</sup>, C. DE-LERUE<sup>3</sup>, E. KALESKI<sup>3</sup>, D. VANMAEKELBERGH<sup>1</sup>, <sup>1</sup>Debye Institute for Nanomaterials Science, University of Utrecht, The Netherlands; <sup>2</sup>Institute for Theoretical Physics, Utrecht, The Netherlands; <sup>3</sup>EMN-ISEN and University of Lille, France; <sup>4</sup>Kavli-Institute for Nanoscience, Delft University of Technology, The Netherlands

**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

**FE-3:IL03 Photocatalytic Air Treatment of VOCs and Bioaerosols in Real Indoor Air Conditions**

B. SANCHEZ<sup>1</sup>, M.C. CANELA<sup>2</sup>, S. SUÁREZ<sup>1</sup>, C.R. NUNES<sup>2</sup>, M. SÁNCHEZ, I. JANSSON<sup>1</sup>, <sup>1</sup>CIEMAT-Photocatalytic Treatment of Pollutants in Air, Madrid, Spain; <sup>2</sup>Environmental Chemistry Research Group - Universidade Estadual do Norte Fluminense. Campos dos Goytacazes, Brazil

**FE-3:IL04 Progress in Solar Water-splitting through Photoelectrochemistry**

J.A. TURNER, National Renewable Energy Laboratory, Golden, CO, USA

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

P.C.K. VESBORG<sup>1</sup>, B. SEGER<sup>1</sup>, T. PEDERSEN<sup>1</sup>, A.B. LAURSEN<sup>2</sup>, O. HANSEN<sup>1</sup>, I. CHORKENDORFF<sup>1</sup>, <sup>1</sup>Technical University of Denmark, Kgs. Lyngby, Denmark; <sup>2</sup>Rutgers, USA

**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

**FE-3:IL07 Thiol Functionalization: A Novel Class of Organic Additives for BHJ Solar Cells**

A. OPERAMOLLA<sup>1</sup>, A. PUNZI<sup>1</sup>, O. HASSAN OMAR<sup>2</sup>, D. GENTILE<sup>1</sup>, D. BLASI<sup>1</sup>, F. BABUDRI<sup>1</sup>, G.M. FARINOLA<sup>1,2</sup>, <sup>1</sup>Dipartimento di Chimica, Università degli Studi di Bari Aldo Moro, Bari, Italy; <sup>2</sup>CNR-ICCOM, Bari, Italy

**FE-3:IL08 Langmuir-Schaefer Films of Aligned Carbon Nanotubes Blended with Conjugate Polymers and their Photoelectrochemical Response**

O. HASSAN OMAR<sup>1</sup>, V. SGOBBA<sup>2</sup>, G. GIANCANE<sup>3</sup>, D. CANNOLETTA<sup>4</sup>, A. OPERAMOLLA<sup>5</sup>, G.M. FARINOLA<sup>1,5</sup>, D.M. GULDI<sup>2</sup>, L. VALLI<sup>6</sup>, <sup>1</sup>CNR-ICCOM, Bari, Italy; <sup>2</sup>Interdisciplinary Center for Molecular Materials, Universitaet Erlangen-Nürnberg, Erlangen, Germany; <sup>3</sup>Dipartimento Beni Culturali, Università del Salento, Lecce, Italy; <sup>4</sup>Dipartimento di Ingegneria dell'Innovazione, Università del Salento, Lecce, Italy; <sup>5</sup>Dipartimento di Chimica, Università degli Studi di Bari Aldo Moro, Bari, Italy; <sup>6</sup>Dipartimento di Scienze e Tecnologie Biologiche ed Ambientali, Università del Salento, Lecce, Italy

**FE-3:IL09 Development of Self-supporting TiO<sub>2</sub> Foams**

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

**FE-3:IL10 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

**FE-3:IL11 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. AS-COOP, P. VAN DER VOORT, COMOC, Department of Inorganic and Physical Chemistry, Ghent University, Ghent, Belgium

**FE-3:IL12 The Photocatalytic Properties of Gypsum Plaster Containing Co-modified TiO<sub>2</sub>-N,C and its Application in Synthetic Dye Removal**

M. JANUS<sup>1</sup>, E. KUSIAK-NEJMAN<sup>2</sup>, K. BUBACZ<sup>2</sup>, A. CZYZEWSKI<sup>2</sup>, J. ZATORSKA<sup>2</sup>, A.W. MORAWSKI<sup>2</sup>, <sup>1</sup>West Pomerania University of Technology, Department of Sanitary Engineering, Szczecin, Poland; <sup>2</sup>West Pomerania University of Technology, Szczecin, Institute of Chemical and Environmental Engineering, Szczecin, Poland

**FE-3:IL13 Development of a Self-contained, PV-powered Domestic Toilet and Electrochemical Wastewater Treatment System**

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



**FE-3:IL14 Photocatalytic Materials Based on F-doped or codoped TiO<sub>2</sub>**  
M.V. DOZZI, **E. SELLI**, Department of Chemistry, University of Milan, Milano, Italy; B. OHTANI, Catalysis Research Center, Hokkaido University, Sapporo, Japan

## Poster Presentations

**FE:P02 Hydrothermal Synthesis and Photocatalytic Properties of Pyrochlore Sm<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> 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:P03 Synthesis and Characterisation of Nano-structured Fe and Ce Modified Titania Thin Films Prepared by Sol-gel Dip Coating**

**M.C. FERRARA**<sup>1</sup>, S. MAZZARELLI<sup>1</sup>, V. MARTINA<sup>1</sup>, M. SCHIOPPA<sup>1</sup>, T. DIKONIMOS<sup>2</sup>, L. TAPPER<sup>1</sup>, <sup>1</sup>ENEA, Technical Unit for Materials Technologies, Brindisi Research Centre, Brindisi, Italy; <sup>2</sup>ENEA, Technical Unit for Materials Technologies, Casaccia Research Centre, S Maria di Galeria, Rome, Italy

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

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

**FE:P05 Rapid Synthesis of Highly Crystalline Anatase TiO<sub>2</sub> Microspheres by Spray Drying: Controlled Synthesis and Enhanced Photocatalytic Activity**

**S. PAL**, A. LICCIULLI, Department of Engineering for Innovation, University of Salento, Lecce, Italy

**FE:P06  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>/Pt Hybrid Nanorings and their Enhanced Photocatalytic Activity**

HANFENG LIANG, **ZHOUCHE WANG**, College of Chemistry and Chemical Engineering, Xiamen University, Xiamen, China

**FE:P07 Control of Phase Coexistence in Calcium Tantalate Junction Composite Photocatalysts for Highly Efficient Hydrogen Production**

**PING WANG**, M. WARK; R. MARSCHALL, Laboratory of Industrial Chemistry, Ruhr-University Bochum, Bochum, Germany; Justus-Liebig-University Giessen, Giessen, Germany

**FE:P08 Influence of SiO<sub>2</sub> 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 CsTaWO<sub>6</sub>: The Influence of Different d<sub>0</sub> Metal-ions on the Photocatalytic Activity of Mixed Oxides with the Defect-Pyrochlore Structure**

**L. SCHWERTMANN**<sup>1</sup>, R. MARSCHALL<sup>2</sup>, M. WARK<sup>3</sup>, <sup>1</sup>Laboratory of Industrial Chemistry, Ruhr-University Bochum, Bochum, Germany; <sup>2</sup>Justus-Liebig-University Giessen, Giessen, Germany; <sup>3</sup>Institute for Chemistry, Carl von Ossietzky University Oldenburg, Oldenburg, Germany

**FE:P10 Visible-light-driven Photocatalytic Inactivation of Escherichia Coli by CuAl<sub>2</sub>O<sub>4</sub> Immobilized on Mineral Wool Fibers**

**QINGWEI ZHU**<sup>1,2</sup>, YIHE ZHANG<sup>2</sup>, FADE WU<sup>2</sup>, DANJUN TANG<sup>2</sup>, PENGQI WANG<sup>2</sup>, <sup>1</sup>School of Materials Science and Technology, China University of Geosciences, Beijing, China; <sup>2</sup>Beijing New Building Materials Public Limited Company, China

**FE:P11 Synthesis of Titanium Dioxide Nanocrystals with High-energy Facets in Trifluoroacetic Acid and their Enhanced Photoelectrochemical Performances in Dye-sensitized Solar Cells**

**SUJUN YUAN**, FANG LEI, JIANJUN XIE, YING SHI, School of Materials Science and Engineering, Shanghai University, Shanghai, P.R. China

**FE:P12 Mechanism of Li-storage in TiO<sub>2</sub> (B) and TiO<sub>2</sub> (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 TiOx 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

**FE:P14 Photocatalysis Discolouration of Water on Tin Dioxide and Zinc Oxide Doped with Sodium**

**H. BENHEBAL**, M. CHAIB, M. BADAOUJI, B. ZIANE, Department of Chemistry, Ibn-Khaldoun University, Tiaret, Algeria

## SYMPOSIUM FF

### MAGNETIC MATERIALS FOR ENERGY

## Oral Presentations

### Session FF-1

#### Hard Magnetic Materials

**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

**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

**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

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

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

**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

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

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

**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

**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

**FF-1:L09 Development of L10 Tetragonal Phase in Continuous and Nanopatterned Fe-Pd Films by Post-deposition Annealing**

**P. TIBERTO**<sup>1</sup>, G. BARRERA<sup>1</sup>, F. CELEGATO<sup>1</sup>, M. COISSON<sup>1</sup>, F. VINAI<sup>1</sup>, P. RIZZI<sup>2</sup>, <sup>1</sup>INRIM, Electromagnetism Division, Torino, Italy; <sup>2</sup>Chemistry Dept, Università di Torino, Torino, Italy

**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

**FF-1:L11 Influence of Mechanical Milling on Properties of SrFe<sub>2</sub>O<sub>19</sub> and SrFe<sub>2</sub>O<sub>19</sub>/Fe<sub>0.65</sub>Co<sub>0.35</sub>; SrFe<sub>2</sub>O<sub>19</sub>/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

**FF-1:L12 Structural and Magnetic Properties of Nd<sub>2</sub>Fe<sub>14</sub>B/Alpha-Fe Nanocomposites Obtained by Mechanical Milling**

**S. MICAN**, Babes-Bolyai University, Faculty of Physics, Cluj-Napoca, Romania; O. ISNARD, Institut Néel, CNRS, Joseph Fourier University, Grenoble, France; I. CHICINAS, Materials Sciences and Engineering Dept., Technical University of Cluj-Napoca, Cluj-Napoca, Romania; V. POP, Babes-Bolyai University, Faculty of Physics, Cluj-Napoca, Romania

**FF-1:IL13 Single Domain SmCo<sub>5</sub>@Co Exchange-coupled Magnets Prepared from Core/shell Complex/GO Particles**

**CE YANG**<sup>1</sup>, LIHUI JIA<sup>2</sup>, SHOUGUO WANG<sup>3</sup>, CHEN GAO<sup>2</sup>, DAWEI SHI<sup>2</sup>, **YANGLONG HOU**<sup>1</sup>, SONG GAO<sup>2</sup>, <sup>1</sup>Department of Materials Science and Engineering, College of Engineering, Beijing, China; <sup>2</sup>College of Chemistry and Molecular Engineering, Peking University, Beijing, China; <sup>3</sup>Institute of Physics, Chinese Academy of Sciences, Beijing, China

**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

**Session FF-2****Soft Magnetic Materials****FF-2:IL01 High Bs-FeSiBPCu Nanocrystalline Soft Magnetic Alloys Contributable to Energy-saving**

**A. MAKINO**, Institute for Materials Research, Tohoku University, Sendai, Japan

**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

**FF-2:L03 Influence of Magnetic Field of Super High Frequency on Hysteretic Properties of Soft Magnetic Microwires**

**A. CHIZHIK**, J. GONZALEZ, Universidad del País Vasco, UPV/EHU, San Sebastian, Spain; A. STUPAKIEWICZ, A. MAZIEWSKI, University of Białystok, Białystok, Poland; A. ZHUKOV, Universidad del País Vasco, UPV/EHU, San Sebastian and IKERBASQUE, Bilbao, Spain

**FF-2:IL04 New Soft Magnetic Materials for High Efficiency Applications**

**R. HASEGAWA**, Metglas, Inc., Conway, SC, USA

**FF-2:IL05 Synthesis of Ferrite Magnets with Magnetization over 1 Tesla**  
**JUN DING**, Department of Materials Science & Engineering, National University of Singapore, Singapore

**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

**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

**FF-2:L08 Prediction of Energy Loss in 6.5% Steel Sheets**

**J. SZCZYGŁOWSKI**, Czestochowa University of Technology, Czestochowa, Poland

**FF-2:L09 The Effect of Compacting Pressure on Power Loss in a SMC**

**B. SLUSAREK**<sup>1</sup>, J. SZCZYGŁOWSKI<sup>2</sup>, K. CHWASTEK<sup>2</sup>, B. JANKOWSKI<sup>1</sup>, <sup>1</sup>Tele and Radio Research Institute, Warsaw, Poland; <sup>2</sup>Czestochowa University of Technology, Czestochowa, Poland

**Session FF-3****Magnetocaloric and Multifunctional Magnetic Materials****FF-3:IL01 Caloric Effects in Ferrioc Materials**

**L. MANOSA**, Facultat de Física, Universitat de Barcelona, Barcelona, Spain

**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

**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

**FF-3:L04 Revealing and Modelling Interactions or Disorder Effects in Magnetocaloric Materials**

**J.S. AMARAL\***, **J.N. GONÇALVES**, **V.S. AMARAL**, Departamento de Física e CICECO, Universidade de Aveiro, Aveiro, Portugal; \*also at IFIMUP-IN e Departamento de Física e Astronomia da Faculdade de Ciências da Universidade do Porto, Porto, Portugal

**FF-3:IL05 Transition Metal Based Magneto Caloric Materials**

**E. BRÜCK**, H.D. NGUYEN, Z. OU, Y. YIBOLE, L. CARON, L. ZHANG, F. GUILLLOU, N. VAN DIJK, Delft Univ. of Technology, Faculty of Applied Sciences, Fundamental Aspects of Materials and Energy, Delft, The Netherlands

**FF-3:IL06 The Search for New Magnetocaloric Materials**

**K.G. SANDEMAN**, Department of Physics, Blackett Laboratory, Imperial College London, London, UK

**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

**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

**FF-3:L09 Tuning the Phase Transition by Si Substitution in Mn1.25Fe0.70P1-xSix Compounds**

**XUEFEI MIAO**<sup>1</sup>, L. CARON<sup>1</sup>, P. ROY<sup>2</sup>, N.H. DUNG<sup>1</sup>, L. ZHANG<sup>1,3</sup>, W.A. KOCK-ELMANN<sup>4</sup>, R. SMITH<sup>4</sup>, R.A. DE GROOT<sup>2</sup>, N.H. VAN DIJK<sup>1</sup>, E. BRÜCK<sup>1</sup>, <sup>1</sup>Department of Radiation Science & Technology, Delft University of Technology, The Netherlands; <sup>2</sup>Department of Electronic Structure of Materials, Radboud University, The Netherlands; <sup>3</sup>BASF Nederland B.V., The Netherlands; <sup>4</sup>ISIS, Rutherford Appleton Laboratory, UK

**FF-3:L10 Reduction of the Energy Barrier in First Order Magnetocaloric Materials**

**K. MORRISON**, Physics Department, Loughborough University, Loughborough, Leicestershire, UK

**FF-3:L11 Structural and Magnetic Properties of the Ternary Compounds Mn3-xFexSn and Mn2-xFexSn 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

**FF-3:L12 Study of Structural and Magnetic Properties of Si-doped MnAs**

**S. GAMA**<sup>1</sup>, M. RODRIGUES FELEZ<sup>1</sup>, A. DE AGUIAR COELHO<sup>2</sup>, <sup>1</sup>Universidade Federal de Sao Paulo - UNIFESP - Campus Diadema, Brazil; <sup>2</sup>Universidade Estadual de Campinas - UNICAMP, Brazil

**FF-3:L13 Characterization of Magnetocaloric Effect in the MnFeP1-xAsx Intermetallic Compounds (x=0.40-0.65)**

**P. WŁODARCZYK**, 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

**FF-3:L14 Hall Probe Imaging of Magnetocaloric LaFe13-xSix**

**E. LOVELL**<sup>1</sup>, **A.M. PEREIRA**<sup>1</sup>, **K. MORRISON**<sup>2</sup>, **O. GUTFLEISCH**<sup>3</sup>, **L.F. COHEN**<sup>1</sup>, <sup>1</sup>The Blackett Laboratory, Imperial College, London, UK; <sup>2</sup>Department of Physics, Loughborough University, Leicestershire, UK; <sup>3</sup>Tech Univ Darmstadt, Dept Mat Science, Darmstadt, Germany

**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

**FF-3:L16 On the Magnetic Fluctuations in the Magnetocaloric-effect in Rare-earth Intermetallic Compounds**

**P. ALVAREZ-ALONSO**<sup>1</sup>, **P. GORRIA**<sup>2</sup>, **J.A. BLANCO**<sup>2</sup>, <sup>1</sup>Departamento de Electricidad y Electrónica, UPV/EHU, Leioa, Spain; <sup>2</sup>Departamento de Física, Universidad de Oviedo, Oviedo, Spain

**FF-3:L17 Enhanced Refrigeration Capacity in RNi2 Polycrystalline Ribbons Fabricated by Melt Spinning**

**P. GORRIA**<sup>1</sup>, **J.L. SÁNCHEZ LLAMAZARES**<sup>2</sup>, **P.J. IBARRA-GAYTAN**<sup>2</sup>, **C.F. SÁNCHEZ-VALDÉS**<sup>2</sup>, **P. ALVAREZ-ALONSO**<sup>3</sup>, **J.A. BLANCO**<sup>4</sup>, <sup>1</sup>Departamento de Física, EPI, Universidad de Oviedo, Gijón, Spain; <sup>2</sup>División de Materiales Avanzados, IPICYT, San Luis Potosí, Mexico; <sup>3</sup>Departamento de Electricidad y Electrónica, Universidad del País Vasco, Bilbao, Spain; <sup>4</sup>Departamento de Física, Facultad de Ciencias, Universidad de Oviedo, Oviedo, Spain

**FF-3:L18 Magnetocaloric Properties of Gd or Nd Substituted La-Ba Manganites**

**G. TONOZLIS**, **G. LITSARDAKIS**, Aristotle University, Thessaloniki, Greece

**FF-3:L19 Direct Adiabatic Temperature Change Measurements in a Series of Modified Gd<sub>5</sub>Si<sub>2</sub>Ge<sub>2</sub> Alloys**

**P. PODMILJSAK**<sup>1,2</sup>, P.J. MCGUINNESS<sup>1,2</sup>, K. SKOKOV<sup>3</sup>, O. GUTFLEISCH<sup>3</sup>, S. KOBE<sup>1</sup>, <sup>1</sup>Department for Nanostructured Materials, Jozef Stefan Institute, Ljubljana, Slovenia; <sup>2</sup>Center of Excellence NAMASTE, Ljubljana, Ljubljana, Slovenia; <sup>3</sup>TU Darmstadt, Darmstadt, Germany

**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

**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, CEAL-LETI, Minatec Campus, Grenoble, France

**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

**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

**FF-3:L24 Atomic Layer- and Chemical Vapor- deposition of Multiferroic Sr-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 FF-4

### Magnetic Devices and Components for Energy Applications

**FF-4:IL01 The Use of Hydrogen to Separate and Recycle Neodymium-Iron-Boron Magnets**

**A. WALTON**, Metallurgy and Materials, University of Birmingham, Edgbaston, Birmingham, UK

**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

**FF-4:L03 Fundamental Physical Restrictions on Power of Magnetocaloric Refrigerator**

**A.P. KAMANTSEV**, E.T. KALIMULLINA, V.V. KOLEDV, A.V. MASHIROV, V.G. SHAVROV, Kotelnikov Institute of Radio-engineering and Electronics RAS, Moscow, Russia

**FF-4:IL04 Novel Si-integrated Magnetic Sensors for High Efficiency Applications**

**M. MORELLI**, STMicroelectronics SRL, Cornaredo (MI), Italy

**FF-4:IL05 Energy Harvesting by Ferromagnetic Shape Memory Alloy Films**

**M. KOHL**, M. GUELTIG, R. YIN, Karlsruhe Institute of Technology, IMT, Karlsruhe, Germany; M. OHTSUKA, H. MIKI, Tohoku University, IMRAM, Sendai, Japan

**FF-4:IL06 Magnetic Shape Memory (MSM) Devices for Energy Harvesting**

**K. ULLAKKO**, Lappeenranta University of Technology, Savonlinna, Finland

**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

**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

## Poster Presentations

**FF:P01 Magnetic Domain Structure of FeCo-based Nanocrystalline Alloys with Induced Transverse Magnetic Anisotropy**

**A. KOLANO-BURIAN**, R. KOLANO, L. HAWELEK, M. POLAK, Institute of Non-Ferrous Metals, Gliwice, Poland

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

**A. SHOKUHFAHAR**, 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:P03 Influence of Grain Size on the Magnetocaloric Effect and Magnetic Properties of La<sub>0.7</sub>Ca<sub>0.3</sub>MnO<sub>3</sub> Compounds**

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

**FF:P04 Cluster-Spin-Glass Behavior in La<sub>0.7</sub>Ca<sub>0.3</sub>MnO<sub>3</sub> 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:P07 Thermal Properties and Non-contact Temperature Measurements of Magnetocaloric Materials**

L. FERREIRA, S.C. SANTOS, **J.S. AMARAL\***, V.S. AMARAL, Departamento de Física e CICECO, Universidade de Aveiro, Aveiro, Portugal; \*also at IFIMUP-IN e Departamento de Física e Astronomia da Faculdade de Ciências da Universidade do Porto, Porto, Portugal

**FF:P08 An Effect of Mn Addition on Magnetocaloric Properties of the LaFe<sub>11.8</sub>Si<sub>1.2</sub> Alloy**

**M. POLAK**, P. WLODARCZYK, L. HAWELEK, A. KOLANO-BURIAN, Institute of Non-Ferrous Metals, Gliwice, Poland

**FF:P09 Structural, Magnetic and Magnetocaloric Properties of the MnFeP<sub>0.5</sub>As<sub>0.5-x</sub>Gex Intermetallic Compounds (x=0-0.04)**

**L. HAWELEK**, P. WLODARCZYK, A. KOLANO-BURIAN, P. ZACKIEWICZ, M. KAMINSKA, Institute of Non-Ferrous Metals, Gliwice, Poland; A. CHROBAK, University of Silesia, Institute of Physics, Katowice, Poland

**FF:P10 The Magnetocaloric Effect of GdFe<sub>1-x</sub>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:P13 Absorption of Electromagnetic Waves by Graphene - Magnetic Semiconductor Superlattice**

I.V. BYCHKOV, **D.A. KUZMIN**, Chelyabinsk State University, Chelyabinsk, Russia; V.G. SHAVROV, Kotelnikov Institute of Radioengineering and Electronics of the Russian Academy of Sciences, Moscow, 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:P15 Emission of Electromagnetic Waves by NiMnGaFe Alloy at Structural Phase Transition**

**I.V. BYCKHOV**, D.A. KUZMIN, Chelyabinsk State University, Chelyabinsk, Russia; D.V. KALENOV, A.P. KAMANTSEV, V.V. KOLEDOV, D.S. KUCHIN, V.G. SHAVROV, Kotelnikov Institute of Radioengineering and Electronics of the Russian Academy of Sciences, Moscow, 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 Fe<sub>5</sub>(Si,P)B<sub>2</sub>**

**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 Ciências Exatas e da Terra, UNIFESP - Diadema, SP, Brazil

**FG-2:IL04 Dynamics of the CdTe Activation Treatment: Effect on the Electrical and Structural Properties of the Absorber**

**A. ROMEO<sup>1</sup>**, A. SALAVEI<sup>1</sup>, I. RIMMAUDO<sup>1</sup>, F. PICCINELLI<sup>2</sup>, D. MENOSSI<sup>3</sup>, A. BOSIO<sup>3</sup>, N. ROMEO<sup>3</sup>, <sup>1</sup>LAPS-Laboratory for Applied Physics, Department of Computer Science, University of Verona, Verona, Italy; <sup>2</sup>Department of Biotechnology, University of Verona, Verona, Italy; <sup>3</sup>Physics and Earth Science Department, University of Parma, Italy

**FG-2:IL05 Junction Formation for Chalcopyrite Solar Cells**

**R. KLENK**, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany

**FG-2:IL06 Current Status of Multijunction Thin-film Silicon Based Solar Cells: From State-of-the art Devices to Aesthetic Building Elements**

**J.-W. SCHÜTTAUF**, C. BALLIF, Ecole Polytechnique Fédérale de Lausanne (EPFL), Photovoltaics and Thin Film Electronics Laboratory, Neuchâtel, Switzerland

**FG-2:IL07 The ILGAR Deposition Method - A Flexible Process for Buffer Layers in Highly Efficient CIS Solar Cells**

**Ch.-H. FISCHER**, R. SÁEZ ARAOZ, J. KRAMMER, T. KÖHLER, M. KRÜGER, Y. FU, M. POMASKA, A. STEIGERT, I. LAUERMAN, S. HARNDT, M.C. LUX-STEINER, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; F. HERGERT, Bosch Solar CISTech, Brandenburg, Germany

**FG-2:IL08 Chalcopyrite Based Solar Materials Grown by Vacuum and Non-vacuum Methods**

**A. LE DONNE**, P. GARATTINI, S. TOMBOLATO, B. VODOPIVEC, M. ACCIARRI, S. BINETTI, Dept. of Materials Science and Solar Energy Research Center (MIB-SOLAR), University of Milano-Bicocca, Milan, Italy; S. MARCHIONNA, RSE S.p.A., Milan, Italy

## SYMPOSIUM FG

## PHOTOVOLTAIC SOLAR ENERGY CONVERSION: SILICON AND BEYOND

## Session FG-3

## Emerging Technologies and New Concepts

## Oral Presentations

## Session FG-1

## Wafer-based Silicon and High-efficiency Solar Cells

**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

**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

**FG-1:IL03 Degradation Modeling of InGaP/GaAs/Ge Triple-junction Solar Cells Irradiated by Protons**

**S.I. MAXIMENKO<sup>1</sup>**, M.P. LUMB<sup>2</sup>, S.R. MESSENGER<sup>1</sup>, R. HOHEISEL<sup>2</sup>, C. AFFOUDA<sup>1</sup>, D. SCHEIMAN<sup>1</sup>, M. GONZALEZ<sup>3</sup>, J. LORENTZEN<sup>1</sup>, P. P. JENKINS<sup>1</sup>, R.J. WALTERS<sup>1</sup>, <sup>1</sup>Naval Research Laboratory, Washington, DC, USA; <sup>2</sup>The George Washington University, Washington, DC, USA; <sup>3</sup>Sotera Defense Solutions, Annapolis Junction, MD, USA

## Session FG-2

## Thin-film Photovoltaics

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

**S. NIKI<sup>1</sup>**, S. ISHIZUKA<sup>1</sup>, Y. KWAMIKAWA<sup>1</sup>, H. KOMAKI<sup>1</sup>, K. MATSUBARA<sup>1</sup>, H. SHIBATA<sup>1</sup>, A. YAMADA<sup>1</sup>, N. TERADA<sup>2</sup>, T. SAKURAI<sup>3</sup>, K. AKIMOTO<sup>3</sup>, <sup>1</sup>Research Center for Photovoltaic Technologies, AIST, Central 2, Tsukuba, Ibaraki, Japan; <sup>2</sup>Kagoshima University, Kagoshima, Kagoshima, Japan; <sup>3</sup>Tsukuba University, Tsukuba, Ibaraki, Japan

**FG-2:IL02 Development of Flexible CIGS and CdTe Solar Cells**

**A.N. TIWARI**, Laboratory for Thin Films and Photovoltaics, Empa - Swiss Federal Laboratories for Material Science and Technology, Dübendorf, Switzerland

**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

**FG-3:IL02 New Carbon-based Materials for the Preparation of Dye Sensitized Solar Cells**

N. MARTÍN<sup>1,2</sup>, **J.L. DELGADO<sup>2</sup>**, <sup>1</sup>Departamento de Química Orgánica, Facultad de Ciencias Químicas, Universidad Complutense de Madrid, Madrid, Spain; <sup>2</sup>IMDEA-Nanociencia, Facultad de Ciencias, Módulo CIX, 3ª planta, Ciudad Universitaria de Cantoblanco, 28049 Madrid, Spain

**FG-3:IL03 Unravelling Electronic Processes and Phenomena in Organic Materials through Polymer Scientists' Tools**

**N. STINGELIN**, Imperial College London, London, UK

**FG-3:IL04 Modified Fullerenes for Organic Photovoltaics**

**N. MARTIN**, Organic Chemistry Department, Chemistry Faculty, Universidad Complutense de Madrid, Madrid, Spain; and IMDEA-Nanociencia, Ciudad Universitaria de Cantoblanco, Madrid, Spain

**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

**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

**FG-3:IL07 Novel Photovoltaic Porous Silicon/Organic Semiconductor Heterostructures**

**V. DEREK<sup>1</sup>**, M. SCHARBER<sup>2</sup>, N. SERDAR SARICIFTCI<sup>2</sup>, M. IVANDA<sup>1</sup>, <sup>1</sup>Rudjer Boskovic Institute, Zagreb, Croatia; <sup>2</sup>Linz Institute for Organic Solar Cells, Linz, Austria

**FG-3:IL08 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

**FG-3:IL09 Modelling of Inorganic (MoS<sub>2</sub>) and Carbon Nanotubes Surrounded by Fullerene's Shell**

L.A. CHERNOZATONSKII, **V.A. DEMIN**, IBCP RAS, Moscow, Russia

**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

**FG-3:IL12 Coherent Electronic Energy Transfer and Organic Photovoltaics**

**E. COLLINI**, Dipartimento di Scienze Chimiche, Università di Padova, Padova, Italy

**FG-3:L13 Simulation of Optical Field Distribution in Organic Solar Cells Based on Tri-layer Anode TCO/Metal/TCO**

**HATEM DJEDJIGA**, BELKAID MOHAMMED SAID, UMMTO, FGEI, LATAGE, Tizi-Ouzou, Algeria

**FG-3:IL14 Organic and Organometallic Molecules for DSSC**

**C. BAROLO**, N. BARBERO, G. VISCARDI, Dipartimento di Chimica, NIS Centre of Excellence, Università di Torino, Torino, Italy; JH YUM, MD.K. NAZEERUDDIN, M. GRAETZEL, Laboratoire de Photonique et Interfaces, Institut des Sciences et Ingénierie Chimiques, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland; F. SAUVAGE, Laboratoire de Réactivité et Chimie des Solides, Université de Picardie Jules Verne, CNRS UMR 7314, Amiens, France; V. GIANOTTI, M. MILANESIO, Dipartimento di 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 Dipartimento di Chimica, Università di Perugia, Perugia, Italy

**FG-3:L15 Engineering Hybrid Polymer/Metal-oxide Interfaces by Self-assembled Molecular Interlayers**

**A. MATTONI**, CNR-IOM Cagliari, Monserrato (CA), Italy

**FG-3:L16 Structural Analysis, Electronic and Optical Properties of the Synthesized Sb<sub>2</sub>S<sub>3</sub> Nanowires of High Aspect Ratio with Small Band Gap as Material for New Dye-sensitized Solar Cells**

**I.Lj. VALIDZIC<sup>1</sup>**, M. MITRIC<sup>1</sup>, N.D. ABAZOVIC<sup>1</sup>, B.M. JOKIC<sup>2</sup>, A.S. MILOSEVIC<sup>1</sup>, Z.S. POPOVIC<sup>1</sup>, F.R. VUKAJLOVIC<sup>3</sup>, <sup>1</sup>Vinca Institute of Nuclear Sciences, Belgrade, University of Belgrade, Serbia; <sup>2</sup>Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia; <sup>3</sup>Vinca Institute of Nuclear Sciences, Belgrade, Serbia

**FG-3:L17 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

Special Session FG-4  
Building Integrated Photovoltaics

**FG-4:IL01 Novel Applications of High-concentration Photovoltaics**

**K. BARNHAM**, Physics Department, Imperial College London, London, UK

**FG-4:IL02 Luminescent Solar Concentrators and Building Integrated Photovoltaics**

**R. FUSCO**, Eni S.p.A. Research Center for Non Conventional Energies, Istituto Eni Donegani, Novara, Italy

**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. MATTEOCCHI, 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 Dypower Consortium, Roma, Italy

**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

## Poster Presentations

**FG:P01 Low Temperature Annealing Effect on Electrical Properties of Multicrystalline Silicon Wafers for Photovoltaic Application**

**A. BOUCHEHAM**, D. BOUHAFS, N. KHELIFATI, B. PALAHOUANE, Centre de Recherche en Technologie des Semi-conducteurs pour l'Energétique, Algiers, Algeria

**FG:P02 Understanding the Formation of Native Defects in CdTe Films Studied with Low Temperature PL**

S. BAHKSHI, S. COLLINS, V. EVANI, M. KHAN, V. PALEKIS, **C. FERKIDES**, Department of Electrical Engineering, University of South Florida, Tampa, FL, USA; C. ROTARU, Faculty of Physics and Engineering, Moldova State University, Chisinau, Moldova; S. VATAVU, Faculty of Physics and Engineering, Moldova State University, Chisinau, Moldova and Department of Electrical Engineering, University of South Florida, Tampa, FL, USA

**FG:P03 Effect of the Thermal Annealing on the Nitrogen Concentration of N-doped TiO<sub>2</sub> Thin Films Deposited by HiPIMS**

C. STEGEMANN<sup>1</sup>, R.S. MORAES<sup>1</sup>, D.A. DUARTE<sup>3,4</sup>, A.S. DA SILVA SOBRINHO<sup>1</sup>, **M. MASSI<sup>1,2</sup>**, <sup>1</sup>Technological Institute of Aeronautics, Plasmas and Processes Laboratory, São José dos Campos, SP, Brazil; <sup>2</sup>Federal University of São Paulo, Institute of Science and Technology, São José dos Campos, SP, Brazil; <sup>3</sup>Catholic University of Santa Catarina, Joinville, SC, Brazil; <sup>4</sup>Federal 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:P05 Structural and Optical Properties of Sol-gel Thin Films for Photovoltaic Applications**

S. KERMADI<sup>1</sup>, **N. AGOUDJIL<sup>2</sup>**, S. SALI<sup>1</sup>, M. BOUMAOUR<sup>1</sup>, <sup>1</sup>Unité de Développement de la Technologie du Silicium, UDTs, Alger, Algeria; <sup>2</sup>Laboratoire de Physicochimie des Matériaux, USTHB, Alger, Algeria

**FG:P06 Atomic Layer Deposition of TiO<sub>2</sub> Thin Films on FTO Substrates for Application in Dye-sensitized Solar Cells**

**R.S. PESSOA**, L.V. SANTOS, H.S. MACIEL, Nanotechplasma Laboratory, University of Paraíba Valley, Sao José dos Campos, SP, Brazil

## SYMPOSIUM FH

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

## Oral Presentations

### Session FH-1

#### Fundamentals

**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

**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

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

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

**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

**FH-1:IL05 Structure and Electronic Properties of In<sub>2</sub>O<sub>3</sub>(111) Surfaces**

K.H.L. ZHANG, A. BOURLANGE, D.J. PAYNE, **R.G. EGDELL**, Department of Chemistry, University of Oxford, Inorganic Chemistry Laboratory, Oxford, UK

**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

**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

**FH-1:IL08 Finding Low Hole Effective Masses p-type Transparent Conducting Oxides through High-throughput Computing**

**G. HAUTIER**, A. MIGLIO, G. CEDER<sup>1</sup>, G.-M. RIGNANESE, X. GONZE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium; <sup>1</sup>Massachusetts Institute of Technology, USA

**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

**FH-1:IL11 Advancing TCO Technologies via the Application of Atomic Layer Deposition**

**M.E. PEMBLE**<sup>1,2</sup>, M. BARDOSOVA<sup>2</sup>, S. KASSIM<sup>2</sup>, H. MANLEY<sup>2</sup>, J. MCGRATH<sup>2</sup>, S. O'BRIEN<sup>2</sup>, I.M. POVEY<sup>2</sup>, C. RYAN<sup>2</sup>, <sup>1</sup>Department of Chemistry, University College Cork, Cork, Ireland; <sup>2</sup>Tyndall National Institute, University College Cork, Cork, Ireland

**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 FH-2

## Material Design and Characterization

**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

**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

**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

**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. KHOKHLOV, A.M. GASKOV, Moscow State University, Moscow, Russia; A.M. ABAKUMOV, University of Antwerp, Antwerp, Belgium

**FH-2:IL05 Molecular Monolayer Tuning of Organic/Metal Oxide Interfaces**

T.M. BRENNER, G. CHEN, J. BRAID, T.E. FURTA, **R.T. COLLINS**, Colorado School of Mines, Golden, CO, USA; D.C. OLSON, D.S. GINLEY, National Renewable Energy Laboratory, Golden, CO, USA

**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

**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

**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

**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

**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

**FH-2:IL11 Efficiency Improvement of n-Oxide Semiconductor/p-Cu2O Heterojunction Solar Cells Fabricated on Thermally Oxidized Cu2O Sheets**

**T. MIYATA**, Y. NISHI, T. MINAMI, Optoelectronic Device System R&D Center, Kanazawa Institute of Technology, Ishikawa, Japan

**FH-2:L12 Structural, Electrical and Optical Properties of Nanostructured Ta-doped TiO2**

**P. MAZZOLINI**<sup>1,2</sup>, P. GONDONI<sup>1</sup>, C.S. CASARI<sup>1,2</sup>, A. LI BASSI<sup>1,2</sup>, <sup>1</sup>Dipartimento di Energia and NEMAS - Center for NanoEngineered Materials and Surfaces, Politecnico di Milano, Milano, Italy; <sup>2</sup>Center for Nano Science and Technology @PoliMI, Istituto Italiano di Tecnologia, Milano, Italy

**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

**FH-2:L14 Nano- and Mesoscale Engineering of Al-doped ZnO by Pulsed Laser Deposition: Towards Flexible Scattering Electrodes**

**P. GONDONI**<sup>1</sup>, P. MAZZOLINI<sup>1,2</sup>, V. RUSSO<sup>1</sup>, C.E. BOTTANI<sup>1,2</sup>, A. LI BASSI<sup>1,2</sup>, C.S. CASARI<sup>1,2</sup>, <sup>1</sup>Dipartimento di Energia and NEMAS - Center for NanoEngineered Materials and Surfaces, Politecnico di Milano, Milano, Italy; <sup>2</sup>Center for Nano Science and Technology @PoliMI, Istituto Italiano di Tecnologia, Milano, Italy

**FH-2:IL15 Rational Design of p-type TCOs**

**D.O. SCANLON**, University College London, Kathleen Lonsdale Materials Chemistry, Department of Chemistry, London, UK

**FH-2:IL16 Site Occupancy in TCOs and the Relationship to Functional Properties**

**M.F. TONEY**, SLAC National Accelerator Laboratory, Menlo Park, CA, USA

**FH-2:L17 Band Structure Engineering of Oxides for Energy Applications**

**SU-HUI WEI**, National Renewable Energy Laboratory, Golden, CO, USA

**FH-2:IL18 Highly Diffuse Fluorine-doped SnO2 Thin Films for Photovoltaic Applications**

G. GIUSTI<sup>1</sup>, V. CONSONNI<sup>1</sup>, D.P. LANGLEY<sup>1,2</sup>, G. REY<sup>1</sup>, S. ZHANG<sup>1</sup>, Y. PEL-LEGRIN<sup>3</sup>, N.D. NGUYEN<sup>2</sup>, **D. BELLET**<sup>1</sup>, <sup>1</sup>Laboratoire des Matériaux et du Génie Physique, CNRS - Grenoble INP, Grenoble Cedex, France; <sup>2</sup>Laboratoire de Physique des Solides, Interfaces et Nanostructures, Département de Physique, Université de Liège, Liège, Belgique; <sup>3</sup>Laboratoire Chimie et Interdisciplinarité, Synthèse, Analyse, Modélisation, CNRS - Faculté des Sciences et des Techniques de Nantes, Nantes Cedex, France

**FH-2:L19 Effect of Temperature on Phase Transition of Ni-Co Oxide and Its Application on Optoelectronics**

**SHU-YI TSAI**<sup>1</sup>, K.-Z. FUNG<sup>1</sup>, C.-N. WEI<sup>2</sup>, H.-Y. BOR<sup>2</sup>, <sup>1</sup>Research Center for Energy Technology and Strategy, Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan, ROC; <sup>2</sup>Metallurgy Section, Materials & Electro-Optics Research Division, Chung-Shan Institute of Science and Technology(CSIST), Gaoping village, Longtan Township, Taoyuan County, Taiwan, ROC

## Session FH-3

## Device Development and Applications

**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

**FH-3:IL02 Advances in Photocatalytic Applications Utilizing Metal Oxide Compounds**

**G. KIRIAKIDIS**<sup>1,2</sup>, V. BINAS<sup>1</sup>, <sup>1</sup>Institute of Electronic Structure and Laser (IESL), Foundation for Research and Technology (FORTH), Vasilika Vouton, Heraklion, Crete, Greece; <sup>2</sup>University of Crete, Physics Department, Heraklion, Crete, Greece

**FH-3:IL03 Preparation and Optical Characterization of ZnO Nanowires for Sensing and Optoelectronic Applications**

C. BARATTO<sup>1,2</sup>, E. COMINI<sup>2,1</sup>, I. CONCINA, M. FERRONI<sup>2,1</sup>, G. FAGLIA<sup>2,1</sup>, V. GALSTYAN<sup>2,1</sup>, R. KUMAR<sup>2,1</sup>, A. PONZONI<sup>2,1</sup>, A. VOMIERO<sup>2,1</sup>, D. ZAPPA<sup>2,1</sup>, **G. SBERVEGLIERI**<sup>2,1</sup>, <sup>1</sup>CNR INO, SENSOR, Brescia, Italy; <sup>2</sup>University of Brescia, Dept. of Information Engineering, Brescia, Italy

**FH-3:IL04 CMOS Oxides used for Amplifiers and Logic Circuits on Paper**

**R. MARTINS**<sup>1</sup>, A. NATHAN<sup>2</sup>, P. BARQUINHA<sup>1</sup>, L. PEREIRA<sup>1</sup>, E. FORTUNATO<sup>1</sup>, <sup>1</sup>CENIMAT/I3N, Departamento de Ciência dos Materiais, Faculdade de Ciências e Tecnologia (FCT), Universidade Nova de Lisboa (UNL), Caparica, Portugal; <sup>2</sup>Department of Engineering, Cambridge University, Cambridge, UK



**FH-3:IL05 Why Amorphous Transparent Conducting Oxides are so Interesting?**

**E. FORTUNATO**, G. GONÇALVES, P. BARQUINHA, L. PEREIRA, R. MARTINS, CENIMAT/I3N, Departamento de Ciência dos Materiais, Faculdade de Ciências e Tecnologia, FCT, Universidade Nova de Lisboa and CEMOP-UNINOVA, Caparica, Portugal

**FH-3:IL06 All Amorphous Metal Oxide p-n Diodes**

**M. GRUNDMANN**, Universität Leipzig, Institut für Experimentelle Physik II, Leipzig, Germany

**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 Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan

**FH-3:L08 Transparent P-type Cu<sub>2</sub>O/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

**Poster Presentations****FH:P01 Oxyfluoride Glasses as Promising Materials**

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

**FH:P02 Electrical and Optical Properties of ZnO:Er Films**

**Y. KAFADARYAN**<sup>1</sup>, N. AGHAMALYAN<sup>1</sup>, A. IGITYAN<sup>1</sup>, S. PETROSYAN<sup>1</sup>, N. ARAMYAN<sup>2</sup>, R. HOVSEPYAN<sup>1</sup>, <sup>1</sup>Institute for Physical Research, NAS, Ashtarak, Armenia; <sup>2</sup>Institute of Radiophysics & Electronics, NAS, Ashtarak, Armenia

**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:P06 ZnS Thin Films by Chemical Bath Deposition**

**PA. LUQUE**<sup>1</sup>, M.A. QUEVEDO-LOPEZ<sup>2</sup>, A. OLIVAS<sup>1</sup>, <sup>1</sup>Centro de Nanociencias y Nanotecnología-UNAM, Ensenada, B.C. México; <sup>2</sup>Department of Materials Science and Engineering, University of Texas at Dallas, Richardson, TX, USA

**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:P08 Polymorphism and Properties in Bi<sub>2</sub>Mo<sub>1-x</sub>Nb<sub>x</sub>O<sub>6-y</sub> Solid Solutions**

**E.P. KHARITONOVA**, V.I. VORONKOVA, M.V. Lomonosov Moscow State University, Moscow, Russia

**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 In<sub>2</sub>O<sub>3</sub>-ZnO-SnO<sub>2</sub> 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

## SYMPOSIUM FI

**MATERIALS AND TECHNOLOGIES FOR SOLID STATE LIGHTING****Oral Presentations**

## Session FI-1

## Material Growth and Processing

**FI-1:IL01 The Transition to Solid State Lighting: Trends and Challenges**  
**B. WESSLER**, OSRAM GmbH, Munich, Germany

**FI-1:IL02 Nanostructure InGaN / GaN Light Emitting Diodes**  
**P.D. DAPKUS**, Y. LIN, Y. NAKAJIMA, A. SEYED, Center for Energy Nanoscience, Ming Hsieh Department of Electrical Engineering, University of Southern California, Los Angeles, CA, USA

**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

**FI-1:IL04 Universal Bipolar Host Materials for Highly Efficient Electrophosphorescent Devices**  
**KEN-TSUNG WONG**, Department of Chemistry, National Taiwan University, Taipei, Taiwan

**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

**FI-1:IL06 AlGaIn Growth for Electron-Beam-Excitation Ultraviolet Light Source**  
**H. MIYAKE**<sup>1</sup>, F. FUKUYO<sup>1,2</sup>, K. HIRAMATSU<sup>1</sup>, Y. KOBAYASHI<sup>2</sup>, <sup>1</sup>Department of Electrical and Electronic Engineering, Mie University, Japan; <sup>2</sup>Hamamatsu Photonics K.K., Japan

**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

**FI-1:IL08 DERI Method; Possible Approach to Longer Wavelength Light Emitters Based on Nitride Semiconductors**  
**Y. NANISHI**<sup>1</sup>, T. YAMAGUCHI<sup>2</sup>, T. ARAKI<sup>1</sup>, <sup>1</sup>Ritsumeikan University, Kusatsu, Japan; <sup>2</sup>Kogakuin University, Hachioji, Japan

**FI-1:IL09 Development of AlN-based Technology for Deep UV Light Sources**  
**Z. SITAR**<sup>1,2</sup>, B. MOODY<sup>1</sup>, S. CRAFT<sup>1</sup>, R. SCHLESSER<sup>1</sup>, R. DALMAU<sup>1</sup>, J. XIE<sup>1</sup>, S. MITA<sup>1</sup>, T. RICE<sup>2</sup>, J. TWEEDY<sup>2</sup>, J. LEBEAU<sup>2</sup>, L. HUSSEY<sup>2</sup>, R. COLLAZO<sup>2</sup>, B. GADDY<sup>2</sup>, D. IRVING<sup>2</sup>, <sup>1</sup>HexaTech, Inc., Morrisville, North Carolina, USA; <sup>2</sup>Dept. of Materials Science and Engineering, North Carolina State Univ., Raleigh, USA

**FI-1:IL10 Manufacturing OLED Using Plate-source Evaporation**  
**CHIENCHIH CHEN**, S.H. LAI, F.C. TUNG, S.H. CHEN, Y.S. WANG, K.C. CHEN, B.K. CHANG, C.-C. WANG, C.-Y. CHEN, Mechanical and Systems Research Laboratories, Industrial Technology Research Institute, Chutung, Hsinchu, Taiwan, ROC

**FI-1:L11 Monolithic White-light LED Based on GaN Doped with Beryllium**  
**H. TEISSEYRE**<sup>1,2</sup>, M. BOCKOWSKI<sup>2</sup>, S. GRZANKA<sup>2</sup>, I. GRZEGORY<sup>2</sup>, A. KOZANECKI<sup>1</sup>, B. DAMILAN<sup>2</sup>, YA. ZHYDACHEVSKII<sup>1</sup>, M. KUNZER<sup>3</sup>, K. HOLC<sup>4</sup>, U.T. SCHWARZ<sup>4</sup>, <sup>1</sup>Institute of Physics PAS, Warsaw, Poland; <sup>2</sup>Institute of High Pressure PAS, Warsaw, Poland; <sup>3</sup>CRHEA-CNRS, Valbonne Sophia Antipolis, France; <sup>4</sup>Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany

**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

**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 FI-2

## Electro-optical Characterization

**FI-2:IL01 Advanced Characterization Methods of InGaN-based LEDs**  
**JONG-IN SHIM**, HYUNSUNG KIM, DONG-SOO SHIN, Hanyang University,ERICA Campus, Ansan, Korea

**FI-2:IL02 Tailoring Electro-optical Properties of Cyclometalated Iridium Complexes**  
**E. BARANOFF**, School of Chemistry, the University of Birmingham, Edgbaston, Birmingham UK

**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

**FI-2:IL04 Novel Microlenses for Light Extraction in OLED Lighting**  
**MAO-KUO WEI**, Department 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

**FI-2:IL05 Terahertz Spectroscopy Study of Semiconductor Nanostructures**  
**XINHAI ZHANG**, Department of Electrical and Electronic Engineering, South University of Science and Technology of China, Shenzhen, China

**FI-2:IL06 Hydrogen Trap Mediated Cathodoluminescence Kinetics in Mg Doped p-type GaN**  
**M.R. PHILLIPS**<sup>1</sup>, C. NENSTIEL<sup>1,2</sup>, M. HOFFMANN<sup>2,3</sup>, G. CALLSEN<sup>1,2</sup>, M. WINTREBERT-FOUQUET<sup>4</sup>, C. TON-THAT<sup>1</sup>, A. HOFFMANN<sup>2</sup>, <sup>1</sup>Microstructural Analysis Unit, University of Technology, Sydney, Broadway, Australia; <sup>2</sup>Technische Universität Berlin, Department of Solid State Physics, Berlin, Germany; <sup>3</sup>Material Science and Engineering, North Carolina State University, Raleigh, NC, USA; <sup>4</sup>BluGlass Limited, Silverwater, NSW, Australia

**FI-2:IL07 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

**FI-2:IL08 Luminescence Enhancement of ZnS:Mn by Eu<sup>2+</sup> Doping**  
**WEI CHEN**, The SAVANT Center Department of Physics, The University of Texas at Arlington, Arlington, TX, USA

## Session FI-3

## Device Structures and Manufacturing

**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

**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

**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

**FI-3:IL04 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

**FI-3:IL05 White LEDs on Flexible Substrates**  
**M. WILLANDER**, Dept. of Science and Technology, Linköping University, Norrköping, Sweden

**FI-3:IL06 Tandem OLEDs for Lighting**  
**LIANG-SHENG LIAO**, Institute of Functional Nano and Soft Materials (FUN-SOM), Soochow University, Suzhou, Jiangsu, China

**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

**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

## Poster Presentations

**FI:P02 Synthesis, Structural and Electrical Properties of PPy-DBSA-Y2O3 Composites**  
**M. SAEED**, ABDUL SHAKOOR, EJAZ AHMAD, Polymer Physics Laboratory, Department of Physics, Bahauddin Zakariya University Multan, Pakistan

**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<sub>1-y</sub>Sn<sub>y</sub> Grown on Si Substrates**  
**MEE-YI RYU**<sup>1</sup>, YUNG KEE YEO<sup>2</sup>, T. HARRIS<sup>2</sup>, J. KOUVETAKIS<sup>3</sup>, R. BEELER<sup>3</sup>, <sup>1</sup>Kangwon National University, Korea; <sup>2</sup>Air Force Institute of Technology, USA; <sup>3</sup>Arizona State University, USA

**FI:P05 Determination of Barrier Lowering of ZnO Schottky Nanodevice upon UV Light Illumination**  
**SHUEN-JIUM YOU**, YING-JHE WANG, CHENG-YAO CHIU, MING-YEN LU, Graduate Institute of Opto-Mechatronics and Advanced Institute of Manufacturing with High-tech Innovations, National Chung Cheng University, Chiayi, Taiwan

**FI:P06 The Effect of UV Treatment to the Growth of ZnO Nanowires on Graphene**  
**CHENG-YAO CHIU**, YING-JHE WANG, SHUEN-JIUM YOU, MING-YEN LU, Graduate Institute of Opto-Mechatronics and Advanced Institute of Manufacturing with High-tech Innovations, National Chung Cheng University, Chiayi, Taiwan

**FI:P07 Selective-grown ZnO Nanowires on Periodic Si Nanorod Arrays for Optoelectronic Applications**  
**YING-JHE WANG**, SHUEN-JIUM YOU, CHENG-YAO CHIU, MING-YEN LU, Graduate Institute of Opto-Mechatronics and Advanced Institute of Manufacturing with High-tech Innovations, National Chung Cheng University, Chiayi, Taiwan

**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

## SYMPOSIUM FJ

## MATERIALS CHALLENGES FOR FUTURE NUCLEAR FISSION AND FUSION TECHNOLOGIES

## Oral Presentations

## Session FJ-1

### Structural Components for Nuclear Fission and Fusion Applications

**FJ-1:IL01 Materials Challenges for Sustainable Fuel Cycles and Nuclear Waste Transmutation**  
**C. FAZIO**, JRC-ITU, Eggenstein Leopoldshafen, Germany

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

**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

**FJ-1:IL04 Challenges in Fusion Divertor Design**

**M. RIETH**<sup>1</sup>, S. ANTUSCH<sup>1</sup>, L. COMMIN<sup>1</sup>, J. HOFFMANN<sup>1</sup>, J. REISER<sup>1</sup>, T. BARRET<sup>2</sup>, D. HANCOCK<sup>2</sup>, M. PORTON<sup>2</sup>, W. TIMMIS<sup>3</sup>, C. WALDON<sup>2</sup>, D. ARMSTRONG<sup>3</sup>, B. GHIDERSA<sup>4</sup>, <sup>1</sup>Karlsruhe Institute of Technology (KIT), Institute for Applied Materials, Karlsruhe, Germany; <sup>2</sup>Culham Centre for Fusion Energy, Culham Science Centre, Abingdon, UK; <sup>3</sup>Department of Materials, University of Oxford, UK; <sup>4</sup>Karlsruhe Institute of Technology (KIT), Institute for Neutron Physics and Reactor Technology, Karlsruhe, Germany

**FJ-1:LO5 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

**FJ-1:LO6 Crystallographic Relationship of Y<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub> 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

**FJ-1:LO7 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

**FJ-1:LO8 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

## Session FJ-2

## Low Activation Structural Materials for Nuclear Fusion Systems

**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

**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

**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

**FJ-2:IL04 Study on the Creep and Fatigue Properties of CLAM Steel** YANYUN ZHAO<sup>1,2</sup>, SHAOJUN LIU<sup>2</sup>, QUNYING HUANG<sup>2</sup>, BOYU ZHONG<sup>2</sup>, <sup>1</sup>FDS Team alnstitute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, China; <sup>2</sup>University of Science and Technology of China, Hefei, Anhui, China

**FJ-2:LO5 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

**FJ-2:LO6 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

## Session FJ-3

## Materials for First Wall Components of Nuclear Fusion Systems

**FJ-3:IL01 The Comprehensive First Mirror Test in the JET Tokamak for ITER**

**M. RUBEL**<sup>1</sup>, D. IVANOVA<sup>1</sup>, P. PETERSSON<sup>1</sup>, A. GARCIA-CARRASCO<sup>1</sup>, J. LIKONEN<sup>2</sup>, A. WIDDOWSON<sup>3</sup> and JET-EFDA Contributors\*, \*JET-EFDA, Culham Science Centre, Abingdon, UK; <sup>1</sup>Alfvén Laboratory, Royal Institute of Technology, Association Euratom - VR, Stockholm, Sweden; <sup>2</sup>Association EURATOM-TEKES, VTT, Espoo, Finland; <sup>3</sup>CCFE/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

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**FJ-3:IL02 New Materials for Nuclear Fusion Plasma-facing Components**

**C. LINSMEIER**, Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung - Plasmaphysik, Jülich, Germany

**FJ-3:IL03 Modeling Irradiation Damage and Dislocation Plasticity in Tungsten for Fusion Applications**

**J. MARIAN**, Lawrence Livermore National Laboratory, Livermore, CA, USA

**FJ-3:LO4 Plasma Materials Interactions**

**J. LINKE**, J. DU, TH. LOEWENHOFF, G. PINTSUK, T. WEBER, M. WIRTZ, Forschungszentrum Juelich, Euratom Association, Juelich, Germany

## Session FJ-4

## Functional Materials

**FJ-4:IL01 Utilization Research and Development of Hydride Materials in Fast Reactors**

**K. KONASHI**, Tohoku University, Ibaraki, Japan

**FJ-4:LO2 Superconductivity Materials for ITER and DEMO Fusion Reactors**

**A.E. VOROBIEVA**, I. M. ABDYUKHANOVA, Y. V. KARASEV, V. A. DROBUSHEV, I.N. GUBKIN, E.A. DERGUNOVA, K.A. MAREEV, JSC "A.A.Bochvar Institute"; A.K. SHIKOV, National Research Centre "Kurchatov Institute", Moscow, Russia

**FJ-4:LO3 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

**FJ-2:LO4 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 FJ-5

## Nuclear Fuel Materials

**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

**FJ-5:LO2 Microstructural Features of the High Burnup Structure**

**T. WISS**, V.V. RONDINELLA, R.J.M. KONINGS, D. STAIU, 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

**FJ-5:LO3 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

**FJ-5:LO4 Status of the Low Enriched Uranium Fuel Development for High Performance Research Reactors**

**L. SANNEN**, S. VAN DEN BERGHE, SCK.CEN, Mol, Belgium

**FJ-5:LO5 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

**FJ-5:LO6 Modelling and Simulation of Nuclear Fuel Rods with the BaCo Code**

**A.C. MARINO**, División SiM<sup>3</sup>, Gerencia Ciclo del Combustible Nuclear (GCCN), Comisión Nacional de Energía Atómica (CNEA), Centro Atómico Bariloche (CAB), Bariloche, Argentina

**FJ-5:LO7 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

**FJ-5:LO8 A Diffusion Model for UF<sub>4</sub> Reaction with Yttria at 1740 K**

**Z.E. ERKMEN**, Marmara Univ. Dept. of Metallurgy & Materials Eng., Göztepe Campus, Istanbul, Turkey

## Session FJ-6

## Radiation Effects

**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



**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

**FJ-6:L03 Irradiation Effect on Structure and Properties of Nanomaterials**

**R.A. ANDRIEVSKI**, Institute of Problems of Chemical Physics, Russian Academy of Sciences, Chernogolovka, Moscow Region, Russia

**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

**FJ-6:IL05 Nuclear Data Needs for Materials of Fission and Fusion Power Reactors**

**A.I. BLOKHIN**<sup>1</sup>, V.M. CHERNOV<sup>2</sup>, <sup>1</sup>A.I. Leypunsky Institute for Physics and Power Engineering, Obninsk, Russia; <sup>2</sup>JSC "A.A. Bochvar High-Technology Research Institute of Inorganic Materials", Moscow, Russia

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

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

**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 of 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

**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

## Session FJ-7

## Materials Modelling and Database

**FJ-7:IL01 Ab Initio Modelling of Dislocations in bcc Metals**

F. WILLAIME, **L. VENTELON**, L. DÉZERALD, CEA Saclay, SRMP, Gif-sur-Yvette, France; D. RODNEY, Université Claude Bernard Lyon 1, ILM, France

**FJ-7:IL02 The IFMIF Project: Status and Prospects for Fusion Materials Irradiation**

**J. KNASTER**, IFMIF/EVEDA, Obuchi, Rokkasho-mura, Japan

**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

**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

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

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

**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-8

## Crosscutting Materials Issues for Nuclear Fission and Fusion Systems

**FJ-8:IL01 Steels for Fission and Fusion Applications**

**J.-L. BOUTARD**, Cabinet du Haut-Commissaire à l'Énergie Atomique, Gif sur Yvette Cedex, France

**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

**FJ-8:IL03 Development of Silicide Coatings on Vanadium Alloys**

**S. MATHIEU**, N. CHAIA, M. VILASI, IJL-Université de Lorraine, Vandoeuvre les Nancy, France; F. ROUILLARD, J.L. COUROUAU, LECNA, CEA Saclay, France

## Poster Presentations

**FJ:P01 Thermal Stability of Microstructure and Texture of Hot-rolled Ferritic ODS Steel**

Y.B. CHUN, S.H. KANG, S. NOH, **TAE KYU KIM**, Nuclear Materials Division, Korea Atomic Energy Research Institute, Daejeon, Korea

**FJ:P02 Characterization of Oxide Dispersion Strengthened Steels Fabricated by Different Hot Consolidation Processes**

**SANGHOON NOH**, YOUNG-BUM CHUN, SUK HOON KANG, JINSUNG JANG, TAE KYU KIM, Nuclear Materials Division, Korea Atomic Energy Research Institute, Daejeon, Rep. of Korea

**FJ:P03 Effects of Zr Addition on Mechanical Behavior of Reduced-activation Ferritic-martensitic Steel**

**YOUNG-BUM CHUN**<sup>1</sup>, S.H. KANG<sup>1</sup>, S. NOH<sup>1</sup>, T.K. KIM<sup>1</sup>, D.W. LEE<sup>2</sup>, S. CHO<sup>3</sup>, Y.H. JEONG<sup>1</sup>, <sup>1</sup>Nuclear Materials Division, Korea Atomic Energy Research Institute, Daejeon, Korea; <sup>2</sup>Nuclear Fusion Engineering Development Division, Korea Atomic Energy Research Institute, Daejeon, South Korea; <sup>3</sup>National Fusion Research Institute, Daejeon, Korea

**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

## Special Session FJ-10

## MATERIALS TECHNOLOGY FOR NUCLEAR WASTE TREATMENT AND DISPOSAL

## Oral Presentations

## Session FJ-10.1

## Waste Form Development, Including Glass, Ceramic, and Metallic Waste Forms

**FJ-10.1:IL01 Selective Decontamination and Stable Solidification of Cs and Sr by Zeolites**

**H. MIMURA**, Tohoku University, Sendai, Japan

**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

**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 Jülich GmbH, Jülich, Germany

**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

**FJ-10.1:L05 Cost-effective and Permanently Safe Containerization of Nuclear Solid Waste Using MgAl<sub>2</sub>O<sub>4</sub> Spinel Ceramics**

**A. ROKHVARGER**, E. VAUGHN-FLAM, Rokon Systems, Inc., New York, NY, USA

**FJ-10.1:L06 A New Matrix for Conditioning Chloride Salt Wastes from the Electrorefining 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

**FJ-10.1:L07 Structure Determination of (Al, Nd)-doped Zirconolite Grown from CaO-SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>-ZrO<sub>2</sub>-Nd<sub>2</sub>O<sub>3</sub>-Na<sub>2</sub>O Glass**

**CHANGZHONG LIAO**, KAIMIN SHIH, Department of Civil Engineering, The University of Hong Kong, Hong Kong

## Session FJ-10.2

## Challenging Waste Constituents, such as Actinides, Noble Metals, and Volatile Species

**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

**FJ-10.2:IL02 Spent Fuel Characterisation by Advanced Spectroscopic Techniques**

**C. DEQUELDRE**, LNM/LES, NES, Paul Scherrer Institute, Villigen, Switzerland

**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

**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

**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 FJ-10.3

## Waste Form Modeling, Performance Testing, and Advanced Characterization Techniques

**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

**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

**FJ-10.3:IL03 The Belgian Approach Towards the Investigation of the Compatibility with Geological Disposal of Eurobitum Bituminized Intermediate Level Radioactive Waste**

**E. VALCKE**<sup>1</sup>, N. BLEYEN<sup>1</sup>, S. SMETS<sup>1</sup>, M. VASILE<sup>1</sup>, X. SILLEN<sup>2</sup>, <sup>1</sup>W&D Expert Group, SCK.CEN, Mol, Belgium; <sup>2</sup>ONDRAF/NIRAS, Brussels, Belgium

**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

**FJ-10.3:IL05 Helium Solubility and Helium Bubble Nucleation in Nuclear Glasses**

**G. GUTIERREZ**<sup>1</sup>, S. PEUGET<sup>1</sup>, E.A. MAUGERI<sup>1</sup>, T. FARES<sup>1</sup>, C. JÉGOU<sup>1</sup>, R. BES<sup>2</sup>, T. SAUVAGE<sup>2,3</sup>, R. PODOR<sup>4</sup>, T. WISS<sup>5</sup>, E. OLIVIERO<sup>6</sup>, S. DONNELLY<sup>7</sup>, <sup>1</sup>CEA, DEN, Laboratoire d'Étude des Matériaux et Procédés Actif, Bagnols-sur-Ceze, France; <sup>2</sup>CNRS, UPR3079 CEMHTI, Orléans cedex, France; <sup>3</sup>Université d'Orléans, Faculté des Sciences, Orléans cedex, France; <sup>4</sup>ICSM, Institut de Chimie Séparative de Marcoule, Bagnols-sur-Ceze, France; <sup>5</sup>European Commission, JRC, Institute for Transuranium Elements (ITU), Karlsruhe, Germany; <sup>6</sup>CSNSM, Centre de Science Nucléaire et de Sciences de la Matière, Orsay, France; <sup>7</sup>Huddersfield University, Huddersfield, UK

## Session FJ-10.4

## Design and Operation of Waste Immobilization facilities, Repository Design, Requirements, and Licensing

**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

**FJ-10.4:IL02 Vitrification of UK Higher Activity Wastes and the Dissolution Mechanisms of Simulant Waste Glasses in Hyperalkaline Conditions Relevant to a Cementitious Geological Disposal Facility**

**N. HYATT**, Department of Materials Science & Engineering, The University of Sheffield, Sheffield, UK

**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

**FJ-10.4:IL04 RADON Operational Experience in High-temperature Treatment of Radioactive Wastes**

**S.V. STEFANOVSKY**, FSUE RADON, Moscow, Russia

## Poster Presentations

**FJ-10:P01 Preparation of Anionic Exchange Adsorbent by Pre-radiation Method and Its Adsorption Performance toward Rhenium Ions**

**JIANHUA ZU**, RUIQIN LIU, YUEZHOU WEI, MAOSONG YE, FANGDONG TANG, LINFENG HE, Nuclear Science and Engineering College, Shanghai Jiaotong University, Shanghai, China

**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

## Oral Presentations

## Session FK-1

## Growth and Processing

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

**L. COLOMBO**<sup>1</sup>, Y. HAO<sup>2</sup>, S. MCDONNELL<sup>3</sup>, R. ADDOU<sup>3</sup>, A. ISMACH<sup>2</sup>, A. AZCATL<sup>3</sup>, S.S. SONDE<sup>2</sup>, S. BANERJEE<sup>2</sup>, R.S. RUOFF<sup>2</sup>, R.M. WALLACE<sup>3</sup>, <sup>1</sup>Texas Instruments, Dallas, TX, USA; <sup>2</sup>University of Texas at Austin, Austin, TX, USA; <sup>3</sup>University of Texas at Dallas, Dallas, TX, USA

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

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

**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. VUL', Ioffe Institute, Saint-Petersburg, Russia

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

**R. YAKIMOVA**<sup>1,2</sup>, G.R. YAZDI<sup>1</sup>, T. IAKIMOV<sup>1,2</sup>, V. DARAKCHIEVA<sup>1</sup>, <sup>1</sup>Linköping University, Linköping, Sweden; <sup>2</sup>Graphensic AB, Sweden

**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

**FK-1:IL06 Nanoporous Carbon Materials for Electrochemical Capacitors: Focus on Structure-property Relationships**

**G. YUSHIN**, Georgia Institute of Technology, School of Materials Science, Atlanta, GA, USA

**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

**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

**FK-1:IL09 What Would be the First Industrial Scale Application of Single-walled Carbon Nanotubes and Why?**

**KENJI HATA**, AIST, Tsukuba, Japan

**FK-1:IL10 Hierarchical Nanoporous Carbon Materials for Supercapacitors and Lithium Sulfur Batteries**

**S. KASKEL**, Dresden University of Technology, and Fraunhofer IWS, Germany

**FK-1:IL11 Insights in the Synthesis of Carbon Nanostructures from Computer Simulation**

**C. BICHARA**, M. DIARRA, CINA M, CNRS and Aix Marseille University, France; H. AMARA, F. DUCASTELLE, LEM, ONERA and CNRS, Chatillon, France

**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

**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. GUE-ORGUIEV**, Department of Physics, Chemistry, and Biology - IFM, Linköping University, Linköping, Sweden

**FK-1:L14 CVD of N-Doped Graphene**

**H. SACHDEV**, Max Planck Institut für Polymerforschung, Mainz, Germany

**FK-1:L15 Spectral Tuning of Graphene Quantum Dots by Salting Out**

**KYUEUI LEE**, SEONGWOO RYU, HAESHIN LEE, Department of Chemistry, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea; SOON HYUNG HONG, The Graduate School of Nanoscience and Technology (WCU), Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea

## Session FK-2

## Structural Characterization

**FK-2:IL01 Boron Doping Profiling in Diamond Multilayers by Electron Microscopy**

**D. ARAUJO**<sup>1</sup>, M.P. ALEGRE<sup>1</sup>, J.C. PIÑERO<sup>1</sup>, P. VILLAR<sup>1</sup>, A. FIORI<sup>2</sup>, E. BUSTARRET<sup>2</sup>, <sup>1</sup>Dpto. Ciencia de los Materiales e IM y QI, Universidad de Cádiz, Puerto Real (Cádiz), Spain; <sup>2</sup>Institut Néel, CNRS-Université Joseph Fourier, Grenoble, France

**FK-2:IL02 Characterization of Diamond-molecular Interfaces by Advanced SPM**

**B. REZEK**, Institute of Physics ASCR, Prague, Czech Republic

**FK-2:IL03 Extended Defects in 2D-materials: Graphene, MoS2 and Silica Bilayers**

**A.V. KRASHENINNIKOV**<sup>1,2</sup>, H.-P. KOMSA<sup>1</sup>, S. KURASCH<sup>3</sup>, J. KOTAKOSKI<sup>1,4</sup>, O. LEHTINEN<sup>1,3</sup>, U. KAISER<sup>3</sup>, <sup>1</sup>Department of Physics, University of Helsinki, Finland; <sup>2</sup>Department of Applied Physics, Aalto University, Finland; <sup>3</sup>Central Facility for Electron Microscopy, Group of Electron Microscopy of Materials Science, Ulm University, Ulm, Germany; <sup>4</sup>Department of Physics, University of Vienna, Austria

**FK-2:IL04 Kelvin Force Microscopy on Graphene**

**W. MERTIN**, C. ALVARADO, G. BACHER, Universität Duisburg-Essen, Duisburg, Germany

**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

**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

**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

**FK-2:IL08 In Situ Raman Spectroscopy Studies of Carbon Nanotubes, Nanodiamond, and Graphene**

**S. OSSWALD**, Department of Physics, Naval Postgraduate School, Monterey, CA, USA

**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

**FK-2:IL10 Endohedral Fullerenes: the Importance of Size, Shape and Electronic Complementarity between Encapsulated Clusters and Cages**

**L. ECHEGOYEN**, University of Texas-EI Paso, EI-Paso, TX, USA

**FK-2:L11 Early Stages of Nanodiamond-to-onion Transformation - A Magnetic Resonance Study**

**A.M. PANICH**, A.I. SHAMES, Ben-Gurion University of the Negev, Be'er Sheva, Israel; N.A. SERGEEV, M. OLSZEWSKI, University of Szczecin, Szczecin, Poland; J.K. MCDONOUGH, V. MOCHALIN, Y. GOGOTSI, Drexel University, Philadelphia, PA, USA

**FK-2:L12 Use of XPS and Synchrotron Radiation Techniques to Investigate Metal Matrix Composites with Non-agglomerated Nanodiamonds**

**V.A. POPOV**<sup>1</sup>, D.N. TOEBBENS<sup>2</sup>, E.A. SKRYLEVA<sup>1</sup>, I.I. KHODOS<sup>3</sup>, A.S. PROSVIRYAKOV<sup>1</sup>, I.M. KARNAUKH<sup>1</sup>, <sup>1</sup>National University of Science and Technology "MISIS", Moscow, Russia; <sup>2</sup>Helmholtz-Zentrum Berlin for Materials and Energy, Berlin, Germany; <sup>3</sup>Institute of Microelectronics Technology and High Purity Materials RAS, Chernogolovka, Moscow region, Russia

**FK-2:L13 Clusterization of Shungite Nonplanar Graphenes in Water and its Hybrids**

**N.N. ROZHKOVA**<sup>1</sup>, S.S. ROZHKOV<sup>1</sup>, A.A. MIKHAILINA<sup>1</sup>, E.F. SHEKA<sup>2</sup>, <sup>1</sup>Institute of Geology Karelian Research Centre RAS, Petrozavodsk, Russia; <sup>2</sup>Peoples' Friendship University of Russia, Moscow, Russia

## Session FK-3

## Properties

**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

**FK-3:LO2 Properties of Graphene Accounting for Thermomechanical Ripple Effects**

**R. MELNIK**, S. PRABHAKAR, Wilfrid Laurier University, Waterloo, Canada

**FK-3:LO3 Carbon Nanotubes: Computational Modeling of Elasticity, Electronic and Magnetic Properties**

**K. MARINOVA SIMEONOVA**, Institute of Mechanics, Bulgarian Academy of Sciences, Sofia, Bulgaria

**FK-3:LO4 Nonlinear Properties of Detonation Nanodiamond Sols and Gels**

A.E. ALEKSENSKII, M.V. BAIDAKOVA, A.T. DIDEIKIN, A.V. SHVIDCHENKO, **A.Ya. VUL**, Ioffe Physical-Technical Institute, St.Petersburg, Russia

**FK-3:IL06 Electrochemical and Bioactive Properties of Diamond Coatings**

**J.S. FOORD**, University of Oxford, Department of Chemistry, Oxford, UK

**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

**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

**FK-3:IL09 Chemically Modified Graphene Heterostructures**

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

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

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

**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

**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 FK-4

## Applications

**FK-4:IL01 Nanodiamond-therapeutic Hybrids for Systemic and Localized Drug Delivery**

**DEAN HO**, Division of Oral Biology and Medicine, Department of Bioengineering, The Weintraub Center for Reconstructive Biotechnology, California NanoSystems Institute, Jonsson Comprehensive Cancer Center, University of California, Los Angeles, CA, USA



**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

**FK-4:IL03 Nanocrystalline Diamond for Micro-Electro-Mechanical Systems**

**O.A. WILLIAMS**, School of Physics and Astronomy, Cardiff University, Cardiff, UK

**FK-4:IL04 High Electric Field Diamond Power Devices**

**E. GHEERAERT**, University of Grenoble-Alps, Grenoble, France

**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

**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

**FK-4:IL07 Graphene-based Nanosandwiches for Energy Storage and Conversion**

**XINLIANG FENG**, Max Planck Institute for Polymer Research, Mainz, Germany

**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

**FK-4:IL09 Technology of Field Emitters Based on Carbon Nanotubes**

**M.L. TERRANOVA**, Dip. di Scienze e Tecnologie Chimiche, MINIMAlab, University of Roma Tor Vergata, Roma, Italy; and NANOSHARE Srl

**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

**FK-4:IL11 Exploration of Carbon-based Nanocomposite Materials for Electrochemical Energy Storage Applications**

**YUEGANG ZHANG**, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou, Jiangsu, China

**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

**FK-4:L13 Carbon Nanomaterials for Capacitive Energy Storage**

**Y. GOGOTSI**, Department of Materials Science and Engineering and A.J. Drexel Nanotechnology Institute Drexel University, Philadelphia, PA, USA

**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

**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**, Department of Material Engineering and Ceramics, AGH-University of Science and Technology, Krakow, Poland; **J. MIZERA**, Materials Design Division, Warsaw University of Technology, Poland

**FK-4:L16 Graphene Oxides and their Hybrids for Solar to Hydrogen and CO<sub>2</sub> Photofixation Applications**

**LI-CHYONG CHEN**<sup>1</sup>, **YAN-GU LIN**<sup>1,2</sup>, **HSIN-CHENG HSU**<sup>3</sup>, **YU-CHUNG CHANG**<sup>3</sup>, **INDRAJIT SHOWN**<sup>2</sup>, **CHEN-HAO WANG**<sup>3</sup>, **KUEI-HSIEN CHEN**<sup>1,2</sup>, <sup>1</sup>Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; <sup>2</sup>Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan; <sup>3</sup>Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan

**FK-4:L17 Graphene Oxide Coated Silica Microspheres and their Electrochemical Characteristics**

**YONGSOK SEO**, Seoul National University, Seoul, Korea; **HYOUNG JIN CHOI**, Inha University, Korea

**FK-4:L18 Electrochemical Measurements and Metal Deposition on Graphene Layers at Liquid/Liquid Interface**

**PS. TOTH**, R.A.W. DRYFE, School of Chemistry, University of Manchester, Manchester, UK

**FK-4:L19 Dual Functionalization of Carbon Nano-onions with Targeting and Imaging Units**

**S. GIORDANI**, Istituto Italiano di Tecnologia (IIT), Genova, Italy; **L. MARKEY**, K. FLAVIN, E. SCANLAN, Trinity Biomedical Sciences Institute, Trinity College, Dublin, Ireland; **V. SPAMPINATO**, G. CECCONE, European Commission, Joint Research Centre, IHCP, Ispra (VA), Italy; **L. ECHEGOYEN**, University of Texas at El Paso, El Paso, TX, USA

**FK-4:L20 Effect of Carbon Nanotube on the Properties of Micro Injection Molded Polylactide Nanocomposites**

**SEONG HUN KIM**, S.H. PARK, Department of Organic and Nano Engineering, Hanyang University, Seoul, Korea; **H. ITO**, Department of Polymer Science and Engineering, Yamagata University, Yonezawa, Yamagata, Japan

**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

**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

**FK-4:L23 Surface-modified Carbon Nanotubes Multifunctional Sensor**

**P. ZBYRAD**<sup>1,2</sup>, **K. GRABOWSKI**<sup>1</sup>, **T. UHL**<sup>1</sup>, <sup>1</sup>AGH University of Science and Technology, Faculty of Mechanical Engineering and Robotics, <sup>2</sup>AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland

**Poster Presentations****FK:P01 Reasearch of Diamond-like Carbon Film Deposited by Double Beam Pulsed Laser**

**YONG CHEN**, SHUYUN WANG, YIMIN LU, YANLONG GUO, GUOJUN HUANG, XU LIU, QIANG WAN, 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. IBRAHIM**<sup>1</sup>, A. OWAIS<sup>2</sup>, M. ATIEH<sup>2</sup>, R. KARNIK<sup>3</sup>, T. LAOUI<sup>1</sup>, <sup>1</sup>Department of Mechanical Engineering, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia; <sup>2</sup>Department Chemical Engineering, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia; <sup>3</sup>Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA

**FK:P03 Large-scale Synthesis of Nanoporous Carbide-derived Carbons**

**A. GOGOTSI**<sup>1</sup>, **Y. GOGOTSI**<sup>2</sup>, <sup>1</sup>Materials Research Centre, Kiev, Ukraine; <sup>2</sup>A.J. Drexel Nanotechnology Institute, Department of Material Science and Engineering, Drexel University, Philadelphia, PA, USA

**FK:P04 Mesoporous Carbon Entrapped with Pd Nanoparticles as Highly Active and Recyclable Heterogeneous Catalysts**

**HUI MAO**<sup>1,2</sup>, **YANG LIAO**<sup>1</sup>, **JUN MA**<sup>1</sup>, **XUEPIN LIAO**<sup>3</sup>, **SHILIN ZHAO**<sup>1</sup>, <sup>1</sup>College of Chemistry and Materials Science, Sichuan Normal University, Chengdu, P.R. China; <sup>2</sup>School of Materials Science and Engineering, Nanyang Technological University, Singapore; <sup>3</sup>National Engineering Laboratory for Clean Technology of Leather Manufacture, Sichuan University, Chengdu, P.R. China

**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 K<sub>2</sub>CO<sub>3</sub>-activated Sugarcane Bagasse**

**V. LORYUENYONG**<sup>1,2</sup>, **J. PHONGTHONGCHAROEN**<sup>1</sup>, **K. KLOMCHIT**<sup>1</sup>, **R. CHAIKLANG**<sup>1</sup>, **A. BUASRI**<sup>1,2</sup>, <sup>1</sup>Department of Materials Science and Engineering, Faculty of Engineering and Industrial Technology, Silpakorn University, Nakhon Pathom, Thailand; <sup>2</sup>National 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. BOUZHNIK**, 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. BUZHNIK**, Institute of Metallurgy and Material Science, Moscow, Russia

**FK:P09 Spin-polarized Electrons in Bilayer Graphene Nanoribbons**

**PA. ORELLANA**<sup>1</sup>, L. ROSALES<sup>1</sup>, L. CHICO<sup>2</sup>, M. PACHECO<sup>1</sup>, <sup>1</sup>Departamento de Física, Universidad T. Federico Santa María, Valparaíso, Chile; <sup>2</sup>Departamento de Teoría y Simulación de Materiales, Instituto de Ciencia de Materiales de Madrid, CSIC, Cantoblanco, Spain

**FK:P10 Graphene Nanoribbon Thermopower as a Tool for Molecular Spectroscopy**

**L. ROSALES**<sup>1</sup>, C.D. NUNEZ<sup>1</sup>, M. PACHECO<sup>1</sup>, A. LATGÉ<sup>2</sup>, P.A. ORELLANA<sup>1</sup>, <sup>1</sup>Departamento de Física, Universidad Técnica Federico Santa María, Valparaíso, Chile; <sup>2</sup>Instituto de Física, Universidade Federal Fluminense, Niterói-RJ, Brazil

**FK:P11 Electronic Properties of Twisted Bilayer Nanoribbons**

**M. PACHECO**, R. VERGARA, E. SUÁREZ MORELL, Departamento de Física, Universidad Técnica Federico Santa María, Valparaíso, Chile; **L. BREY**, L. CHICO, Instituto de Ciencia de Materiales de Madrid (ICMM), Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain

**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 its Application to "Thread Transistor"**

**M. YOSHIDA**, T. OYA, Yokohama National University, Yokohama, Japan

**FK:P17 Energy Gap Associated to Photocatalytic Activity of MWCNT/TiO<sub>2</sub> Nanocomposites**

**S. DA DALT**<sup>1,2</sup>, A.K. ALVES<sup>1</sup>, J.S. PINTO<sup>1</sup>, C.P. BERGMANN<sup>1</sup>, <sup>1</sup>Department of Materials, Federal University of Rio Grande do Sul, RS, Brazil; <sup>2</sup>Engineering Center, Federal University of Pelotas, RS, Brazil

**FL-1:IL03 Diffusion and Segregation in Special Grain Boundaries**

**H. EDELHOFF**, **G. WILDE**, **S.V. DIVINSKI**, Institute of Materials Physics, University of Münster, Germany

**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

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

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

**FL-1:IL06 Nucleation and Growth at Reactive Interfaces**

**A. GUSAK**, Cherkasy National University, cherkasy, Ukraine; **F. HODAJ**, Grenoble University, France; **KING NING TU**, University of California, Los Angeles, CA, USA

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

**B. YILDIZ**<sup>1</sup>, ZHUHUA CAI<sup>1</sup>, A. KUSHIMA<sup>1</sup>, QIYANG LU<sup>1</sup>, N. TSVETKOV<sup>1</sup>, JEONG WOO HAN<sup>1</sup>, YAN CHEN<sup>1</sup>, J. FLEIG<sup>2</sup>, M. KUBICEK<sup>2</sup>, <sup>1</sup>Laboratory for Electrochemical Interfaces, Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA; <sup>2</sup>Institute of Chemical Technologies and Analytics, Vienna University of Technology, Vienna, Austria

**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

**FL-1:IL09 Ionic and Electronic Transport under Chemical Potential Gradients**

**M. MARTIN**, Institute of Physical Chemistry, RWTH Aachen University, Aachen, Germany

**FL-1:IL10 Electron Quantum Transport in Disordered Graphene**

**I. DERETZIS**, A. LA MAGNA, CNR-IMM, Catania, Italy

**FL-1:IL11 Mass Transport in Grain Boundaries: Mechanism and Controversial Subjects**

**B. BOKSHEYN**, National University of Science and Technology "MISIS", Moscow, Russia

**FL-1:IL12 Capillary-driven Interdiffusion Along Interphase Boundaries in Solids**

**E. RABKIN**, D. AMRAM, L. KLINGER, Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa, Israel

**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

**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

**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

**FL-1:IL17 Percolation of Electronic and Ionic Carrier in Single Phase Materials**

**S. YAMAGUCHI**<sup>1</sup>, DONGYOUNG KIM<sup>2</sup>, T. TSUCHIYA<sup>3</sup>, S. MIYOSHI<sup>1</sup>, Y. SHIBUYA<sup>1</sup>, <sup>1</sup>Dept. Materials Engg., School of Engg., The University of Tokyo, Tokyo, Japan; <sup>2</sup>Samsung Research Center, Korea; <sup>3</sup>MANA, NIMS, Japan

**FL-1:IL18 Atomistic Modelling of Diffusion Processes of Light Elements in Metals**

**J. ROGAL**, R. DRAUTZ, ICAMS, Ruhr-Universität Bochum, Bochum, Germany

**FL-1:L19 Spin-related Properties of the GeTe Ferroelectric Rashba Semiconductor**

**C. RINALDI**, S. BERTOLI, M. CANTONI, R. BERTACCO, Department of Physics - Politecnico di Milano, Como, Italy; **I. VOBORNIK**, G. PANACCIONE, TASC Laboratory - Elettra Synchrotron IOM-CNR, Trieste, Italy; **J. KREMPASKY**, Swiss Light Source at the Paul Scherrer Institut, Villigen, Switzerland; **R.-N. WANG**, J. BOSCHER, A. GIUSSANI, R. CALARCO, Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; **D. DI SANTE**, S. PICOZZI, CNR-SPIN, L'Aquila, Italy

## FL - 4th International Conference

## MASS, CHARGE AND SPIN TRANSPORT IN INORGANIC MATERIALS: FUNDAMENTALS TO DEVICES

## Oral Presentations

## Session FL-1

## Mass and Charge Transport Mechanisms

**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

**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

**FL-1:L20 Conductivity Manipulation of Metal Single Crystals by Grain Boundary Control and Impurity Doping**

**SE-YOUNG JEONG**, Department of Cogno-Mechatronics Engineering, Pusan National University, Miryang, Republic of Korea; J.Y. KIM, C.-R. CHO, Department of Nano Fusion Technology, Pusan National University, Miryang, Republic of Korea; M.-W. OH, Fundamental and Creativity Research Division, Korea Electrotechnology Research Institute, Changwon-si, Republic of Korea; S. LEE, The Institute of Basic Science, Korea University, Seoul, Republic of Korea; Y. C. CHO, Crystal Bank Research Institute, Pusan National University, Miryang, Republic of Korea; J.-H. YOON, Busan center, Korea Basic Science Institute, Busan, Republic of Korea; G.W. LEE, Korea Research Institute of Standards and Science & Department of Science of Measurement, University of Science and Technology, Daejeon, Republic of Korea; C.H. PARK, Department of Physics Education & RCDAMP, Pusan National University, Busan, Republic of Korea

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

**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

**FL-2:IL03 Wetting Phase Transition in Grain Boundaries**

**B.B. STRAUMAL**<sup>1,2</sup>, B. BARETZKY<sup>2</sup>, <sup>1</sup>Institute of Solid State Physics Russian Academy of Sciences, Chernogolovka, Russia; <sup>2</sup>Karlsruher Institut für Technologie (KIT), Institut für Nanotechnologie, Eggenstein-Leopoldshafen, Germany

**FL-2:IL04 Atomic Transport and Defect Reactions in Semiconductors**

**H. BRACHT**, Institute of Materials Physics, University of Münster, Münster, Germany

**FL-2:IL05 Oxygen Surface Exchange Kinetics Studies by Time-resolved X-ray Diffraction**

**J. SANTISO**, R. MORENO, J. ROQUETA, P. GARCÍA, J. ZAPATA, ICN2. Institut Catala de Nanociencia i Nanotecnologia, Campus UAB, Bellaterra, Barcelona. Spain

**Session FL-3****Role of Mass and Charge Transport in Application Engineering****FL-3:IL01 Graphene for Low Energy Applications**

**ZHIHONG CHEN**, Purdue University, West Lafayette, IN, USA

**FL-3:IL02 Effects of Lattice Strain on Oxide Ion Diffusivity in Pr<sub>2</sub>NiO<sub>4</sub> 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

**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

**FL-3:IL04 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

**FL-3:IL05 Mass and Charge Transport in Solid Oxide Fuel Cells**

**T. KAWADA**, Tohoku University, Sendai, Japan

**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

**FL-3:IL07 Protonic SOFC Based on LaSrSc<sub>3</sub> 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

**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

**FL-3:IL09 Antiferromagnetic Spintronics**

**T. JUNGWIRTH**, Institute of Physics ASCR, v.v.i., Praha, Czech Republic and School of Physics and Astronomy, University of Nottingham, Nottingham, UK

**FL-3:IL10 Multi-species Transport in Protonic Ceramic Membranes Based on Y-doped Barium Cerate/Zirconate**

**W.G. COORS**, CoorsTek, Inc. Corporate R&D, Golden, CO, USA

**Poster Presentations****FL-P01 Effect of Ultrasonic Treatment on the Defect Structure of the Si-SiO<sub>2</sub> System**

**D. KROPMAN**, Tallinn University of Technology, Tallinn, Estonia

**FL-P02 Chiral Transmission to Self-assembling Nanostructures from Circularly Polarized Light**

**JIHYEON YEOM**<sup>1</sup>, BONGJUN YEOM<sup>2</sup>, SUNG JIN CHANG<sup>3</sup>, WEI-SHUN CHANG<sup>4</sup>, GONGPU ZHAO<sup>5</sup>, PEIJUN ZHANG<sup>5</sup>, S. LINK<sup>4</sup>, N.A. KOTOV<sup>1,2</sup>, <sup>1</sup>Department of Macromolecular Science and Engineering, University of Michigan, Ann Arbor, MI, USA; <sup>2</sup>Department of Chemical Engineering, University of Michigan, Ann Arbor, MI, USA; <sup>3</sup>Division of Material Sciences, Korea Basic Science Institute, Daejeon, Republic of Korea; <sup>4</sup>Department of Electrical and Computer Engineering, Rice University, Houston, TX, USA; <sup>5</sup>University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

**FM - International Conference****NOVEL NON-VOLATILE INORGANIC MEMORY DEVICES: MATERIALS, CONCEPTS AND APPLICATIONS****Oral Presentations****Session FM-1****Resistance Switching Memories (ReRAM)****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

**FM-1:IL02 Hafnia-based ReRAM Memory**

**G. BERSUKER**, SEMATECH, Albany, NY, USA

**FM-1:IL03 Resistive Switching in the Chalcogenide Compounds AM<sub>4</sub>Q<sub>8</sub> (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

**FM-1:IL04 TMO-based Memristive Devices and Application for Neuronomorphic 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

**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<sup>1,2</sup>, SEUL JI SONG<sup>1</sup>, JUNG HO YOON<sup>1</sup>, KYUNG JEAN YOON<sup>1</sup>, TAE HYUNG PARK<sup>1</sup>, DAE EUN KWON<sup>1</sup>, HYUNGKWANG LIM<sup>1,2</sup>, GUN HWAN KIM<sup>1</sup>, DOO SEOK JEONG<sup>2</sup>, **CHEOL SEONG HWANG**<sup>1</sup>, <sup>1</sup>Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, Seoul, South Korea; <sup>2</sup>Electronic Materials Research Center, Korea Institute of Science and Technology, Seoul, South Korea



**FM-1:IL06 Low-power Operation and Reliability of Oxide-based RRAM**  
**D. IELMINI**, DEIB, Politecnico di Milano, Milano, Italy

**FM-1:IL07 On the Origin of Failure Mechanism of Endurance and Retention of HfO<sub>2</sub> 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

**FM-1:IL08 CBRAM vs OxRAM: Active Material Selection Depending on the Final Application**

**E. VIANELLO**<sup>1</sup>, G. MOLAS<sup>1</sup>, P. BLAISE<sup>1</sup>, O. THOMAS<sup>1</sup>, F. LONGNOS<sup>1</sup>, B. TRAORE<sup>1</sup>, G. PALMA<sup>1</sup>, J. GUY<sup>1</sup>, T. CABOUT<sup>1</sup>, K. XUE<sup>1</sup>, M. BERNARD<sup>1</sup>, A. ROULE<sup>1</sup>, E. SOUCHIER<sup>1</sup>, C. CARABASSE<sup>1</sup>, M. REYBOZ<sup>1</sup>, H. GRAMPEIX<sup>1</sup>, J.F. NODIN<sup>1</sup>, A. TOFFOLI<sup>1</sup>, E. JALAGUIER<sup>1</sup>, O. PIRROTTA<sup>2</sup>, A. PADOVANI<sup>2</sup>, L. LARCHER<sup>2</sup>, L. FONSECA<sup>3</sup>, Y. NISHI<sup>4</sup>, B. DE SALVO<sup>1</sup>, L. PERNIOLA<sup>1</sup>, <sup>1</sup>CEA, LETI, MINATEC, Grenoble, France; <sup>2</sup>DISMI Università di Modena e Reggio Emilia, Reggio Emilia, Italy; <sup>3</sup>State University of Campinas, Brazil; <sup>4</sup>Department of Electrical Engineering, Stanford University, California, USA

**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

**FM-1:IL10 Bottom-up Fabrication of Metal-oxide-metal Nanowires with Controlled Resistive Switching Functionality**

**S. BRIVIO**<sup>1</sup>, G. TALLARIDA<sup>1</sup>, D. PEREGO<sup>2</sup>, S. FRANZ<sup>2</sup>, S. SPIGA<sup>1</sup>, <sup>1</sup>Laboratorio MDM, IMM-CNR, Agrate Brianza, Italy; <sup>2</sup>Dipartimento di Chimica, Materiali ed Ing. Chimica "G.Natta", Politecnico di Milano, Milano, Italy

**FM-1:IL11 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

**FM-1:IL11b 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

**FM-1:IL12 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

**FM-1:IL14 Vertical Structures for High-density Resistive Switching Based RAM**

B. HUDEC, P. JANCOVIC, A. ROISOVÁ, **K. FRÖHLICH**, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia; C.C. WAN, C-W. HSU, I-T. WANG, T-H. HOU, Department of Electronics Engineering and Institute of Electronics, National Chiao Tung University, Hsinchu, Taiwan

**FM-1:IL15 Resistive Switching in MIM-structures Based on HfxAl1-xOy and TiN both Grown by ALD**

**K.V. EGOROV**, A.M. MARKEEV, YU.YU. LEBEDINSKII, A.V. ZABLITSKIY, A.A. KUZIN, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia

## Session FM-2

### Phase Change Memories (PCM)

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

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

**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. BERNASCONI**, Department of Materials Science, University of Milano-Bicocca, Milano, Italy; J. BEHLER, Lehrstuhl fuer Theoretische Chemie, Ruhr-Universitaet, Bochum, Germany

**FM-2:IL03 TEM Study of the Low Resistance State in GST Ge Rich & N Doped PRAM Devices**

**M. COUE**<sup>1</sup>, G. NAVARRO<sup>1</sup>, V. SOUSA<sup>1</sup>, V. DELAYE<sup>1</sup>, L. PERNIOLA<sup>1</sup>, N. BERNIER<sup>1</sup>, P. NOÉ<sup>1</sup>, F. FILLOT<sup>1</sup>, C. SABBIONE<sup>1</sup>, D. BLACHIER<sup>1</sup>, P. ZULIANI<sup>2</sup>, R. ANNUNZIATA<sup>2</sup>, G. REIMBOLD<sup>1</sup>, <sup>1</sup>CEA, LETI, MINATEC Campus, Grenoble Cedex, France; <sup>2</sup>STMicroelectronics, Technology R&D, Agrate Brianza, Italy

**FM-2:IL04 Engineering of Chalcogenide Materials for Embedded Applications of Phase Change Memory**

**P. ZULIANI**, E. PALUMBO, E. VARESI\*, G. DALLA LIBERA, M. BORGHI, R. ANNUNZIATA, STMicroelectronics, Agrate Brianza, Italy; \*Micron, Agrate Brianza, Italy

**FM-2:IL05 Chemical Bonding and Spectroscopy of Phase Change Materials**

**A.V. KOLOBOV**, P. FONS, J. TOMINAGA, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

**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

**FM-2:IL07 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

**FM-2:IL08 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

**FM-2:IL09 Phase Change Memory Nano-scale Evolution**

**R. BEZ**, A. PIROVANO, Micron, Agrate Brianza, Italy

**FM-2:IL10 Spin Control and Storage using [(GeTe)<sub>x</sub>(Sb<sub>2</sub>Te<sub>3</sub>)<sub>y</sub>]z 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

**FM-2:IL11 Structural and Electrical Properties of [(SiTe)<sub>x</sub>(Sb<sub>2</sub>Te<sub>3</sub>)<sub>y</sub>]z 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

## Session FM-3

### Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

**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

**FM-3:IL02 On the Origin of Ferroelectric Resistive Switching in BiFeO<sub>3</sub> Thin Films**

S. FAROKHIPOOR, **B. NOHEDA**, Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands

**FM-3:IL03 Ferroelectric Memories based on Resistive Switching**

**A. GRUVERMAN**, Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, USA

**FM-3:IL04 Recent Developments in Manipulating Domain Wall Motion in Wires with Perpendicular Anisotropy**

**D. RAVELOSONA**, CNRS/Université Paris Sud, Orsay, France

**FM-3:IL05 Ultimate Scalability of MRAMs and Logic Functionalities**

**I.L. PREJBEANU**<sup>1</sup>, R.C. SOUSA<sup>1</sup>, B. DIENY<sup>1</sup>, J.-P. NOZIERES<sup>1</sup>, S. BANDIERA<sup>2</sup>, L. LOMBARD<sup>2</sup>, Q. STAINER<sup>2</sup>, K. MACKAY<sup>2</sup>, <sup>1</sup>SPINTEC, UMR8191 CEA/DSM/INAC-CNRS-UJF, Grenoble, France; <sup>2</sup>Crocus Technology, Grenoble, France

**FM-3:IL06 Doped Hafnium Oxide - An Enabler for Ferroelectric Field Effect Transistors**

**T. MIKOLAJICK**<sup>1,2</sup>, U. SCHROEDER<sup>1</sup>, J. MÜLLER<sup>3</sup>, S. MÜLLER<sup>1</sup>, T. SCHENK<sup>1</sup>, E. YURCHUK<sup>1</sup>, S. SLESAZECK<sup>1</sup>, <sup>1</sup>NaMLab GmbH, Dresden, Germany; <sup>2</sup>Institut für Halbleiter und Mikrosystemtechnik, TU Dresden, Dresden, Germany; <sup>3</sup>Fraunhofer Center Nanoelectronic Technologies, Dresden, Germany

**FM-3:IL07 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

**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

**FM-3:L09 Integration of Ferromagnetic and Ferroelectric Oxides on Semiconductors**

A.A. DEMKOV<sup>1</sup>, A.B. POSADAS<sup>1</sup>, P. PONATH, M. CHOI, H. SEO, K. FREDRICKSON, R. HATCH, D.J. SMITH<sup>2</sup>, M.R. MCCARTENTY<sup>2</sup>, <sup>1</sup>Department of Physics, The University of Texas, Austin, TX, USA; <sup>2</sup>Department of Physics, Arizona State University, Tempe, AZ, USA

## Session FM-4

## Memristive Materials, Devices and Emerging Applications

**FM-4:IL01 Phase-change Memories, Memristors and Memflectors**

C.D. WRIGHT, Department of Engineering, University of Exeter, Exeter, UK

**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

**FM-4:L03 Study of Memristive Switching Effects in MIM-stacks with the Graded Functional Layer**

Yu. MATVEYEV, NRNU "Moscow Engineering Physics Institute", Moscow, Russia; YU. LEBEDINSKII, A. MARKEEV, K. EGOROV, Moscow Institute of Physics and Technology, Moscow region, Russia; A. ZENKEVICH, National Research Center "Kurchatov Institute", Moscow, Russia

**FM-4:L04 BiFeO<sub>3</sub> 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

**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

**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

**FM-4:IL07 Nanodevices for Bio-inspired Computing: Memristors & More**

J. GROLLIER *et al.*, CNRS/Thales, Palaiseau, France

**FM-4:IL08 Tunnel Junction Based Memristors for Neuromorphic Processing**

A. THOMAS, Bielefeld University and Mainz University, Germany

**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

## Poster Presentations

**FM:P01 Block Copolymer Self Assembling for the Fabrication of Nanoscale HfO<sub>2</sub> Resistive Switching Memories**

J. FRASCAROLI<sup>1,2,3</sup>, S. BRIVIO<sup>1</sup>, F. FERRARESE LUPI<sup>1</sup>, F. VOLPE<sup>1</sup>, M. PEREGO<sup>1</sup>, L. BOARINO<sup>2</sup>, S. SPIGA<sup>1</sup>, <sup>1</sup>Laboratorio MDM, IMM-CNR, Agrate Brianza, Italy; <sup>2</sup>INRIM, NanoFacility, Division Electromagnetism, Torino, Italy; <sup>3</sup>Università degli studi di Milano, Milano, Italy

**FM:P02 Extraction of Filament Properties in Resistive Random Access Memory (ReRAM) Consisting of Binary-transition-metal-oxides**

T. MORIYAMA<sup>1</sup>, R. KOISHI<sup>1</sup>, K. KIMURA<sup>1</sup>, S. KISHIDA<sup>1,2</sup>, K. KINOSHITA<sup>1,2</sup>, <sup>1</sup>Tottori University, Koyama-Minami, Tottori, Japan; <sup>2</sup>Tottori University Electronic Display Research Center, Koyama-Kita, Japan

**FM:P03 Effect of Electrode Material on the Crystallisation of GaV<sub>4</sub>S<sub>8</sub> Thin Films Dedicated to Mott Memory Applications**

J. TRANCHANT, M.-P. BESLAND, E. JANOD, L. CARIO, B. CORRAZE, Institut des Matériaux Jean Rouxel (IMN), Université de Nantes, UMR CNRS 6502, Nantes, France

**FM:P04 Analysis of Resistive Switching Effect Induced by Hydrogen Introduction Using X-ray Absorption Fine Structure**

A. HANADA<sup>1</sup>, H. MIURA<sup>1</sup>, T. NOTSU<sup>1</sup>, H. OSAWA<sup>2</sup>, T. INA<sup>2</sup>, M. SUZUKI<sup>2</sup>, N. KAWAMURA<sup>2</sup>, M. MIZUMAKI<sup>2</sup>, T. URUGA<sup>2</sup>, S. KISHIDA<sup>1,3</sup>, K. KINOSHITA<sup>1,3</sup>, <sup>1</sup>Tottori University, Koyama-Minami, Tottori, Japan; <sup>2</sup>JASRI / SPring-8, Hyogo, Japan; <sup>3</sup>Tottori 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<sup>1,2</sup>, S. YURA<sup>1</sup>, T. YAMASAKI<sup>3</sup>, K. NAKADA<sup>1</sup>, A. ISHII<sup>1</sup>, S. KISHIDA<sup>1,2</sup>, <sup>1</sup>Tottori University, Koyama-Minami, Tottori, Japan; <sup>2</sup>Tottori University Electronic Display Research Center, Koyama-Kita, Japan; <sup>3</sup>National 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 BiFeO<sub>3</sub>**

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 HfxZr1-x Oy and TiN Thin Films for Ferroelectric Memory Applications**

A.G. CHERNIKOVA, A.M. MARKEEV, YU.YU. LEBEDINSKII, A.V. ZABLOT-SKIY, 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. SCHÄFERS, Bielefeld University, Bielefeld, Germany; A. THOMAS, Mainz University, Mainz, Germany

**FM:P13 Nanocrystal Memory: Charge Transport in Single- and Double Layered NVMs**

V. IEVTUKH<sup>1</sup>, A. NAZAROV<sup>1</sup>, V. TURCHANIKOV<sup>1</sup>, V. LYSENKO<sup>1</sup>, A. NASSIO-POULOU<sup>2</sup>, V.E. Lashkaryov Institute of Semiconductor Physics NASU, Kyiv, Ukraine; <sup>2</sup>Institute of Microelectronics, NCSR 'Demokritos', Aghia Paraskevi, Athens, Greece

FN - 7th International Conference  
SCIENCE AND ENGINEERING OF  
NOVEL SUPERCONDUCTORS

## Oral Presentations

## Session FN-1

## Materials, Structure, Physical Chemistry and General Properties

**FN-1:IL01 Ferroelectricity and Magnetoelectric Coupling in Under-doped Cuprates**

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

**FN-1:IL02 Atomic-layer Engineering and Physics of Cuprate Superconductors**

I. BOZOVIC, Brookhaven National Laboratory, Upton, NY, USA

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

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

## Session FN-3

## Properties of Superconductors (of Any Type)

**FN-1:IL04 Superconductivity in (Cu<sub>1-x</sub> Mo<sub>x</sub>)Sr<sub>2</sub>RECu<sub>2</sub>O<sub>7+δ</sub> (RE = Y, Er, Tm) Molybdocuprates**

**M.A. ALARIO-FRANCO**<sup>1</sup>, S. MARIK<sup>1, 2</sup>, E. MORÁN<sup>1</sup>, C. LABRUGERE<sup>2</sup>, O. TOULEMONDE<sup>2</sup>, A. DOS SANTOS<sup>1</sup>, I. HERRERO-ANSORREGUI<sup>1</sup>, <sup>1</sup>Dpto. Química Inorgánica, Facultad de CC. Químicas, U. Complutense de Madrid, Madrid, Spain; <sup>2</sup>CNRS, Université de Bordeaux, ICMCB, Pessac, France

**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

**FN-1:IL06 2D Superconductivity by Ionic Gating**  
**Y. IWASA**, University of Tokyo and RIKEN, Tokyo, Japan

**FN-1:IL07 Exploring High-Tc Superconductivity by Strain and Electric Field Effect**  
**D. PAVUNA**, EPFL, Lausanne, Switzerland

**FN-1:IL08 Fe-vacancy Order and Superconductivity in Tetragonal β-Fe<sub>1-x</sub>Se**

TA-KUN CHEN<sup>1</sup>, CHUNG-CHIEH CHANG<sup>1</sup>, HSIAN-HONG CHANG<sup>2</sup>, AI-HUA FANG<sup>1</sup>, CHIH-HAN WANG<sup>1</sup>, WEI-HSIANG CHAO<sup>1</sup>, CHUAN-MING TSENG<sup>1</sup>, YUNG-CHI LEE<sup>1, 3</sup>, YU-RUEI WU<sup>1</sup>, MIN-HSUEH WEN<sup>1</sup>, HSIN-YU TANG<sup>4, 5</sup>, FU-RONG CHEN<sup>1, 4</sup>, MING-JYE WANG<sup>1, 2</sup>, **MAW-KUEN WU**<sup>1, 3, 6</sup>, DIRK VAN DYCK<sup>5</sup>, <sup>1</sup>Institute of Physics, Academia Sinica, Taipei, Taiwan; <sup>2</sup>Institute of Astronomy and Astrophysics, Academia Sinica, Taipei, Taiwan; <sup>3</sup>Departments of <sup>3</sup>Physics and <sup>4</sup>Engineering and System Science, National Tsing Hua University, Hsinchu, Taiwan; <sup>5</sup>Electron Microscopy for Materials Science, Department of Physics, University of Antwerp, Antwerp, Belgium; <sup>6</sup>Department of Physics, National Dong Hwa University, Hualien, Taiwan

## Session FN-2

## New Superconductors of the Prictides and Related Families

**FN-2:IL01 Progress in Epitaxial Thin Films of 122-type Iron-prictide Superconductors: Non-equilibrium Impurity Doping and Critical Current Density**

**H. HIRAMATSU**<sup>1, 3</sup>, H. HOSONO<sup>1, 2, 3</sup>, <sup>1</sup>Materials and Structures Laboratory, Tokyo Institute of Technology, Japan; <sup>2</sup>Materials Research Center for Element Strategy, Tokyo Institute of Technology, Japan; <sup>3</sup>Frontier Research Center, Tokyo Institute of Technology, Japan

**FN-2:IL02 Interface Induced High Tc Superconductivity and its Implication on the Pairing Mechanism of Unconventional Superconductivity**  
**QI-KUN XUE**, Department of Physics, Tsinghua University, Beijing, China

**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 Department, University of Genova, Genova, Italy; A. JOST, U. ZEITLER, High Field Magnet Laboratory, Institute for Molecules and Materials, Radboud University Nijmegen, Nijmegen, Netherlands; C. TARANTINI, J. JAROSZYNSKI, Applied Superconductivity Center, National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL, USA; E. REICH, B. HOLZAPFEL, IFW Dresden, Dresden, Germany

**FN-2:IL04 Separation of Antiferromagnetism and High-temperature Superconductivity in Ca<sub>1-x</sub>LaxFe<sub>2</sub>As<sub>2</sub>**

**J. PAGLIONE**, S.R. SAHA, T. DRYE, S.K. GOH, L.E. KLINTBERG, J.M. SILVER, F.M. GROSCHE, M. SUTHERLAND, T.J.S. MUNSIE, G.M. LUKE, D. K. PRATT, J.W. LYNN, Center for Nanophysics and Advanced Materials, Department of Physics, University of Maryland, College Park, MD, USA

**FN-2:IL05 Superconductivity in Iron-based Materials**

**M. PUTTI**, Department of Physics, University of Genova and CNR-SPIN, Genova, Italy

**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

**FN-2:IL07 Angle-resolved Photoemission Spectroscopy Study of Iron-prictide Superconductors**

**HONG DING**, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, CAS, Beijing, China

**FN-2:IL08 Superconductivity at T<sub>c</sub> = 36.5 K in Na-substituted SrFe<sub>2</sub>As<sub>2</sub> Single Crystals**

**L. SHLYK**, M. BISCHOFF, R. NIEWA, Institut für Anorganische Chemie, Universität Stuttgart, Stuttgart, Germany; E. ROSE, Physikalisches Institut, Universität Stuttgart, Stuttgart, Germany

**FN-3:IL01 Static to Dynamical Antiferromagnetic Correlation in Electron-doped Cuprate Superconductors Studied by ARPES**

**A. FUJIMORI**, Department of Physics, University of Tokyo, Tokyo, Japan

**FN-3:IL02 Charge Order Driven by Fermi-arc Instability in Underdoped Cuprates**

**A. DAMASCELLI**, University of British Columbia, Vancouver, Canada

**FN-3:IL03 Designer Dirac Electronic and Superconducting Materials Synthesized via Scanning Tunneling Microscope Quantum Assembly**  
**H.C. MANOHARAN**, Stanford University, Department of Physics, Stanford, CA, USA

**FN-3:IL04 Preparation and Characterization of Superconducting (La,Sr)CuO<sub>4</sub> Nanowires by Means of Electrospinning**

**M.R. KOBLISCHKA**, X. ZENG, U. HARTMANN, Institute of Experimental Physics, Saarland University, Saarbrücken, Germany

**FN-3:IL05 Influence of Spatial Disorder on Superconducting State of a 3D Superconductor**

**C. PARRA**<sup>1</sup>, F.C. NIESTEMSKI, P. GIRALDO-GALLO<sup>2, 3</sup>, A.W. CONTRYMAN<sup>2, 3</sup>, T.H. GEBALLE<sup>3, 4</sup>, I.R. FISHER<sup>3, 4</sup>, H.C. MANOHARAN<sup>2, 5, 3</sup>, <sup>1</sup>Departamento de Física, Universidad Técnica Federico Santa María, Valparaíso, Chile; <sup>2</sup>Department of Physics, Stanford University, Stanford, CA, USA; <sup>3</sup>Geballe Laboratory for Advanced Materials, Stanford University, Stanford, CA, USA; <sup>4</sup>Department of Applied Physics, Stanford University, Stanford, CA, USA; <sup>5</sup>Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory, Menlo Park, CA, USA

**FN-3:IL06 STM Spectroscopy Probe of Magnetic Field Depairing and Vortex Lattice Transition in a Multiband Superconductor**

**I. FRIDMAN**<sup>1</sup>, V. LUKIC<sup>2</sup>, C. KLOC<sup>3</sup>, C. PETROVIC<sup>4</sup>, **J.Y.T. WEI**<sup>1, 5</sup>, <sup>1</sup>University of Toronto, CANADA; <sup>2</sup>Stevens Institute of Technology, USA; <sup>3</sup>Nanyang Technological University, Singapore; <sup>4</sup>Brookhaven National Laboratory, USA; <sup>5</sup>Canadian Institute for Advanced Research, Canada

**FN-3:IL07 High Tc 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

**FN-3:IL08 Role of Mg-B-O Nanostructural Inhomogeneities on the Performance of Superconducting MgB<sub>2</sub>**

**T.A. PRIKHNA**<sup>1</sup>, M. EISTERER<sup>2</sup>, V.V. KOVYLAEV<sup>3</sup>, H.W. WEBER<sup>2</sup>, V. MOSHCHIL<sup>1</sup>, W. GAWALEK<sup>4</sup>, X. CHAUD<sup>5</sup>, <sup>1</sup>Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine; <sup>2</sup>Atominstytut, Vienna University of Technology, Vienna, Austria; <sup>3</sup>Institute for Problems in Material Science of the National Academy of Sciences of Ukraine, Kiev, Ukraine; <sup>4</sup>Institut für Photonische Technologien, Jena, Germany; <sup>5</sup>CNRS/LNMP, Grenoble Cedex, France

**FN-3:IL09 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

## Session FN-4

## Theory and Mechanisms (for Normal and Superconducting States)

**FN-4:IL01 Spin-Polarised Supercurrents: A Paradigm Shift for Spintronics**

**J.W.A. ROBINSON**<sup>1</sup>, A. DI BERNARDO<sup>1</sup>, T. HIGGS<sup>1</sup>, A. WELLS<sup>1</sup>, N. BANERJEE<sup>1</sup>, M. EGILMEZ, M.G. BLAMIRE<sup>1</sup>, Y. KALCHEIM<sup>2</sup>, O. MILLO<sup>2</sup>, <sup>1</sup>Department of Material Science and Metallurgy, University of Cambridge, Cambridge, UK; <sup>2</sup>Racah Institute of Physics and the Hebrew University Center for Nanoscience and Nanotechnology, The Hebrew University of Jerusalem, Jerusalem, Israel

**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

**FN-4:IL03 Recent Progress in Modeling Electronic Structure and Spectroscopy of Novel Superconductors and Topological Insulators**

**A. BANSIL**, Physics Department, Northeastern University, Boston, Massachusetts, USA

**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



**FN-4:IL05 Density Functional Theory for Plasmon-assisted Superconductivity**

R. AKASHI, R. ARITA, RIKEN Center for Emergent Matter Science (CEMS), Saitama, Japan

**FN-4:IL06 Magnetic and Ionic Effects in High-temperature Superconductors**

G. NIKSIC, D.K. SUNKO, S. BARISIC, Department of Physics, Faculty of Science, University of Zagreb, Zagreb, Croatia

**FN-4:LO7 High Temperature Superconductivity within t-J Model: Comparison to Experiment**

J. SPALEK, J. KACZMARCZYK, Marian Smoluchowski Institute of Physics, Jagiellonian University, Krakow, Poland

## Session FN-5

## Vortex Lattice Physics

**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

**FN-5:IL02 Vortex Structures in Iron-based Superconductors by Small-angle Neutron Scattering**

H. KAWANO-FURUKAWA, Ochanomizu University, Bunkyo-ku, Tokyo, Japan

**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

## Session FN-6

## Synthesis and Processing

**FN-6:IL01 Dominant Second Harmonic in the Josephson Current-phase Relation: Manifestation of the Long-range Spin-triplet Proximity Effect in Ferromagnetic Bilayers**

Z. RADOVIC, University of Belgrade, Department of Physics, Belgrade, Serbia

**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

**FN-6:LO3 Synthesis and Characterization of Phenacene Superconducting Hydrocarbons**

G.A. ARTIOLI, L. MALAVASI, Dip. di Chimica, Università di Pavia-INSTM UdR di Pavia, Pavia, Italy

**FN-6:LO4 Synthesis of MgB<sub>2</sub> 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

**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

**FN-6:IL06 Single Crystal Growth of BaFe<sub>2</sub>As<sub>2</sub>-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

**FN-6:LO7 Optimally Processed MgB<sub>2</sub> Bulk Magnets with High Critical Currents**

M. MURALIDHAR<sup>1</sup>, K. INOUE<sup>1</sup>, M.R. KOBLISCHKA<sup>2</sup>, M. MURAKAMI<sup>1</sup>, <sup>1</sup>Superconducting Materials Laboratory, Department of Materials Science and Engineering, Shibaura Institute of Technology, Tokyo, Japan; <sup>2</sup>Institute of Experimental Physics, Saarland University, Saarbrücken, Germany

## Session FN-7

## Applications

**FN-7:IL01 Recent Progress in Superconducting Radio-frequency Cavities for High Energy Particle Accelerators**

R.S. ORR, Department of Physics, University of Toronto, Toronto, Canada

**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

**FN-7:IL03 Novel Materials for High-current Superconducting Coils: from MgB<sub>2</sub> to FeSeTe**

C. FERDEGHINI, CNR-SPIN, Genova, Italy

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

T. SHIBAUCHI, Department of Physics, Kyoto University, Kyoto, Japan

**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

**FN-7:LO6 Light MgB<sub>2</sub> 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

**FN-7:IL07 Superconductors beyond Nb<sub>3</sub>Sn in View of Energy Applications and Accelerators**

R. FLÜKIGER, Dept. Phys. Cond. Matter (DPMC), Geneva, Switzerland and CERN, TE-MSC

**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

**FN-7:IL09 Physics and Applications of High-Tc Superconductors**

J.L. TALLON, MacDiarmid Institute & Callaghan Innovation, Lower Hutt, New Zealand

**FN-7:IL10 Nano Domain Encoding in Transport Properties of Unconventional Josephson Junctions and Nanostructures**

F. TAFURI<sup>1,2</sup>, D. MASSAROTTI<sup>3,2</sup>, D. STORNAIUOLO<sup>3,2</sup>, L. GALLETTI<sup>3,2</sup>, L. LONGOBARDI<sup>1</sup>, P. LUCIGNANO<sup>2</sup>, A. TAGLIACCOZZO<sup>3,2</sup>, G. ROTOLI<sup>1</sup>, D. MONTEMURRO<sup>4</sup>, LOMBARDI<sup>5</sup>, <sup>1</sup>Seconda Università di Napoli, Italy; <sup>2</sup>CNR-SPIN, Unità di Napoli, Italy; <sup>3</sup>Università di Napoli Federico II, Napoli, Italy; <sup>4</sup>Scuola Normale Superiore & NEST, Pisa, Italy; <sup>5</sup>Chalmers University, Gøteborg, Sweden

**FN-7:IL11 Recent Progress in Terahertz Emission and Detection of High Temperature Superconducting Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8</sub>+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

## Poster Presentations

**FN:P01 Orientation Control of Bismuth-based Cuprate Thin Films by Spin Coating and MOCVD Targeting Future Electronics Applications**

K. ENDO, T. KANEKO, Kanazawa Institute of Technology, Hakusan, Ishikawa, Japan; P. BADICA, National Institute of Materials Physics, Bucharest, Atomistilor, Romania; S. ARISAWA, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

**FN:P02 Thermopower Studies of Multiband Superconductors**

K. OGANISIAN, K. ROGACKI, Institute of Low Temperature and Structure Research, Wrocław, 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 YBa<sub>2</sub>Cu<sub>3</sub>O<sub>y</sub> Bulk Superconductors Produced by Infiltration-growth Process**

K. NAKAZATO<sup>1</sup>, M. MURALIDHAR<sup>1</sup>, K. INOUE<sup>1</sup>, M.R. KOBLISCHKA<sup>2</sup>, M. MURAKAMI<sup>1</sup>, <sup>1</sup>Superconducting Materials Laboratory, Department of Materials Science and Engineering, Shibaura Institute of Technology, Tokyo, Japan; <sup>2</sup>Institute 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. KOSEOGLU, 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-Tc Superconductor Microbridges under Thermal Smallest 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

**FO - 10th International Conference  
 MEDICAL APPLICATIONS OF  
 NOVEL BIOMATERIALS AND NANO-  
 BIOTECHNOLOGY**

### Oral Presentations

#### Session FO-1

##### Advances in Biomaterials

**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

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

**A.R. STUART**, Complex Materials, Department of Materials, ETH Zurich, Switzerland

**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

**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

**FO-1:IL05 Engineering Materials for Regenerative Medicine**

**S. COHEN**, The Regenerative Medicine and Stem cell (RMSC) Research Center & The Avram & Stella Goldstein-Goren Department of Biotechnology Engineering, Ben-Gurion University of the Negev, Beer Sheva, Israel

**FO-1:IL06 Self-assembled Nanostructured Biomaterials for Biomedical Devices**

**H. FENNIRI**, Northeastern University and Qatar Biomedical Research Institute, Boston, MA, USA

**FO-1:IL07 Nanostructured Materials and Systems for Biomedical Applications**

**J.Y. YING**, Institute of Bioengineering and Nanotechnology, Singapore

**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

**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

**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 Technology (KIST) Seoul, Republic of Korea; University of Science and Technology (UST), Seoul, Republic of Korea

**FO-1:L11 Facile in situ Synthesis and Impregnation of Silver Nanoparticles in a Hydrophobic Polymer for Antimicrobial Biomaterials**

**PA. TRAN**, A.J. O'CONNOR, Department 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

**FO-1:L15 Diopside Glass-ceramics for Dental and Biomedical Applications**

**J. AL-MUHAMADI**, N. KARPUKHINA, M. CATTELL, Centre for Adult Oral Health, Institute of Dentistry, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, UK

**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

**FO-1:L17 Bioactive and Biocompatible Silica/Pseudowollastonite Aerogels**

**P.J. RESÉNDIZ HERNÁNDEZ**, D.A. CORTÉS HERNÁNDEZ, CINVESTAV-IPN, Unidad Saltillo, Ramos Arizpe, Mexico

**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

**FO-1:L19 Surface Modification of Highly Dispersed Cobalt Iron Oxide Nanoparticles by Anionic Surfactant (OA-PEG) for Hyperthermia Therapy Application**

**A.B. SALUNKHE**, V.M. KHOT, S.H. PAWAR, Center for Interdisciplinary Research, D. Patil University, Kolhapur, Maharashtra, India

#### Session FO-2

##### Enabling Tools

**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

**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

**FO-2:L03 Understanding Interactions of Nanomaterials with Biological Environment: Insights from Simulations**

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

**FO-2:L04 Atmospheric Pressure Plasma Patterning of Biocompatible Glass: Comparison of Localized Treatment Effectiveness with Different Plasma Sources**

V. COLOMBO, M. GHERARDI, R. LAURITA, **A. LIGUORI**, A. STANCAMPIANO, Alma Mater Studiorum - Università di Bologna, Department of Industrial Engineering (DIN), Bologna, Italy

**FO-2:L05 Separation of Cells in Multiphase Systems**

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

**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

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

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

**FO-2:L09 Porous Silicon based Biosensors and Microarray**

I. REA, A. CALIO', J. POLITI, M. TERRACCIANO, **L. DE STEFANO**, IMM-CNR, Napoli, Italy

#### Session FO-3

##### Medical Diagnostics and Imaging

**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

**FO-3:IL02 Novel Nanostructured Sensors for Orthopaedics**

**S. SIRIVISOOT**, Biological Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi, Bangkok, Thailand

**FO-3:L03 Responsive Nanoparticulate MRI Contrast Agents**

**G.-L. DAVIES**, Department of Chemistry, University of Warwick, Coventry, UK; W.-Y. HUANG, J.J. DAVIS, Department of Chemistry, University of Oxford, Oxford, UK

**FO-3:L04 Organic Electrochemical Transistor as an Ideal Tool for Bio-sensing and Monitoring Biomolecules Dynamics and Drug-induced Cellular Stress**

**G. TARABELLA**<sup>1</sup>, A. ROMEO<sup>1</sup>, P. D'ANGELO<sup>1</sup>, C. CAFFARRA<sup>2</sup>, D. CRETTELLA<sup>2</sup>, P.G. PETRONINI<sup>2</sup>, R. MOSCA<sup>1</sup>, A. PEZZELLA<sup>3</sup>, S. IANNOTTA<sup>1</sup>, <sup>1</sup>Institute of Materials for Electronics and Magnetism (IMEM), National Research Council (CNR), Parma, Italy; <sup>2</sup>Dept. of Experimental Medicine, University of Parma, Italy; <sup>3</sup>Dept. of Chemical Science, University of Federico II, Naples, Italy

**FO-3:L05 Synthesis and Magnetic Properties of Zn<sub>x</sub>Fe<sub>3-x</sub>O<sub>4</sub> Nanoparticles for MRI Contrast Agents**

V.V. PANKOV, D.A. KOTIKOV, **E.G. PETROVA**, Belarusian State University, Minsk, Belarus

**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. TEREPTYK, V.V. TUCHIN, Saratov State University, Saratov, Russia

## Session FO-4

### Tissue Engineering and Regenerative Medicine

**FO-4:IL01 3D Reconstruction of Cell Sheet Tissue Engineering**

**T. OKANO**, Vice President and Professor, Institute of Advanced Biomedical and Science (TWIns), Tokyo Women's Medical University, Tokyo, Japan

**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

**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

**FO-4:IL04 Nanocomposite and Hybrid Tissue Engineering Scaffolds**

**MIN WANG**, Department of Mechanical Engineering, The University of Hong Kong, Hong Kong

**FO-4:IL05 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

**FO-4:IL06 Effect of Surface Roughness of Glass on in Vitro Bioactivity and Interaction with Human Adipose Stem Cells**

**L. BJÖRQVIST**, L. HUPA, Process Chemistry Centre, Abo Akademi University, Turku, Finland; M. OJANSIVU, S. VANHATUPA, S. MIETTINEN, BioMediTech, University of Tampere, Tampere, Finland

**FO-4:IL07 Development of Biomimetic 45S5 Bioglass® and Boron-containing Bioactive Glass Scaffolds by Surface Functionalization with Alkaline Phosphatase for Bone Tissue Engineering Applications**

**P. BALASUBRAMANIAN**<sup>1</sup>, L. HUPA<sup>2</sup>, A.R. BOCCACCINI<sup>1</sup>, <sup>1</sup>Department of Materials Science and Engineering, Institute of Biomaterials, Friedrich-Alexander-University of Erlangen-Nürnberg, Erlangen, Germany; <sup>2</sup>Abo Akademi University, Finland

**FO-4:IL08 Novel Microfabrication of 3D Composite Lattice Scaffold for Bone Tissue Engineering**

D. NADEEM<sup>1</sup>, M. DALBY<sup>2</sup>, GANG LI<sup>3</sup>, **BO SU**<sup>1</sup>, <sup>1</sup>Biomaterials Engineering Group, School of Oral & Dental Sciences, University of Bristol, UK; <sup>2</sup>Centre for Cell Engineering, University of Glasgow, UK; <sup>3</sup>School of Biomedical Sciences, Chinese University of Hong Kong, China

**FO-4:IL09 Polymer-based Scaffolds with Vascular Network for Bone Tissue Engineering**

I. GERGES<sup>1</sup>, M. TAMPLENIZZA<sup>1</sup>, C. RECORDATI<sup>1</sup>, A. TOCCHIO<sup>1,2</sup>, F. MARTELLI<sup>1</sup>, P. MILANI<sup>1,3</sup>, **C. LENARDI**<sup>1,3</sup>, <sup>1</sup>Fondazione Filarete, Milano, Italy; <sup>2</sup>SEMM, European School of Molecular Medicine, Campus IFOM-IEO, Milano, Italy; <sup>3</sup>CIMaNa and Dipartimento di Fisica, Università degli Studi di Milano, Milano, Italy

## Session FO-5

### Targeted Delivery, Controlled Release Systems and Nanotheranostics

**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

**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

**FO-5:IL03 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

**FO-5:IL05 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

**FO-5:IL06 Protein-based Hybrid Nanocapsules for Targeted Anti-cancer Theranostics**

JEONG YU LEE, MI HWA OH, JEONG HEON YU, HYUNG SEOK CHOI, **YOON SUNG NAM**, Korea Advanced Institute of Science and Technology, Department of Materials Science and Engineering, Daejeon, Republic of Korea

**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

**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

**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

## Session FO-6

### Materials for Neural Interfaces and Implantable Neural Devices

**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

**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

**FO-6:IL03 New Generation CNT-based Biochips for Interfacing the Central Nervous System**

**L. BALLERINI**, University of Trieste, Trieste, Italy

**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

**FO-6:IL05 Regenerative Peripheral Nerve Interfacing of Smart Prosthetics**

**M. ROMERO-ORTEGA**, University of Texas at Arlington, Arlington, TX, USA

**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

**FO-6:IL07 Flexible Optical and Electronic Platforms for Neural Recording, Interrogation and Repair**

A. CANALES<sup>1</sup>, XIAOTING JIA<sup>2</sup>, A. LU<sup>1</sup>, U. FRORIEP<sup>2</sup>, **P. ANIKEEVA**<sup>1,2</sup>, <sup>1</sup>Department of Materials Science and Engineering, <sup>2</sup>Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA, USA

**FO-6:IL08 Modulating 3D-Cellular Networks Using Layer-by-Layer Multifunctional Interfaces**

**M. MATSUSAKI**, M. AKASHI, Department of Applied Chemistry, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan



## Session FO-7

### Progress in Implant Prostheses

#### 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

#### FO-7:IL02 Cortical-bone-mimetic Hierarchical Composites

**E. JABBARI**, Chemical Engineering Department, University of South Carolina, Columbia, SC, USA

#### 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

#### FO-7:LO4 Mechanical Behaviour of Alumina Toughened Zirconia Nanocomposites with Different Alumina Additions

**L.A. DIAZ**<sup>1</sup>, S. RIVERA<sup>2</sup>, A. FERNÁNDEZ<sup>1</sup>, A. OKUNKOVA<sup>3</sup>, YU.G. VLADIMIROV<sup>3</sup>, R. TORRECILLAS<sup>1,3</sup>, <sup>1</sup>Centro de Investigación en Nanomateriales y Nanotecnología (CINN) Consejo Superior de Investigaciones Científicas (CSIC) - Universidad de Oviedo (UO) - Principado de Asturias (PA), Llanera, Asturias, Spain; <sup>2</sup>Nanoker Research, S.L., Polígono de Olloniego, Oviedo, Asturias, Spain; <sup>3</sup>Moscow State University of Technology "STANKIN", Moscow, Moscow Oblast, Russian Federation

### Poster Presentations

#### FO:P01 Preparation of a Novel Antibacterial Resin System for Improved Dental Restorative

**DONG XIE**, YIMING WENG, LEAH HOWARD, Department of Biomedical Engineering, Indiana University-Purdue University at Indianapolis, Indiana, USA

#### 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, Republic of Korea; Department of Biomedical Engineering, University of Science and Technology (UST), Seoul, Republic 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

**V. GONZALEZ-TORRES**, E.R. MÉNDEZ, Centro de Ciencias de la Salud Unidad Valle de las Palmas UABC, Tijuana, Baja California, México; L.A. GAITÁN-CEPEDA, Facultad de Odontología UNAM, México; M.E. TORRES-ARELLANO, Facultad de Odontología Tijuana UABC, Tijuana, Baja California, México; C. DÍAZ-TRUJILLO, Facultad de Ciencias Químicas e Ingeniería UABC, Tijuana, Baja California, México

#### FO:P05 Cytotoxicity and Cell Adhesion Studies on Alloys Used in Implants Coated with Diamond-like Carbon Containing Silver and/or Titanium Dioxide Nanoparticles

**E.D. SANTOS**<sup>1</sup>, M.A.G. CARDOSO<sup>2</sup>, F.S. MIRANDA<sup>1</sup>, F.L.C. LUCAS<sup>1</sup>, F.K.FERRARIS<sup>3</sup>, L.V. SANTOS<sup>1</sup>, R.S. PESSOA<sup>1</sup>, H.S. MACIEL<sup>1</sup>, <sup>1</sup>Nanotechnology laboratory, University of Paraíba Valley, São José dos Campos, SP, Brazil; <sup>2</sup>Immunology laboratory, University of Paraíba Valley, São José dos Campos, SP, Brazil; <sup>3</sup>Pharmacology Laboratory, Quality Control in Health National Institute (INCQS / FIOCRUZ), Rio de Janeiro, RJ, Brazil

#### FO:P06 Fluorescent Dendron-CD Nanotubes for Biosensory Platform

JEONGHUN LEE, DOOHONG MIN, **CHULHEE KIM**, Department of Polymer Science and Engineering, Inha University, Incheon, Korea

#### FO:P07 Hyperespectral Raman Imaging Generated by Nanodiamonds in Gamma-exposed Human Red Blood Cells

**M. PEDROZA-MONTERO**<sup>1</sup>, K. SANTACRUZ-GOMEZ<sup>2</sup>, S. ALVAREZ-GARCIA<sup>1</sup>, E. SILVA-CAMPA<sup>1</sup>, M. ACOSTA-ELIAS<sup>2</sup>, B. CASTANEDA<sup>2</sup>, R. MELENDREZ<sup>1</sup>, D. SOTO-PUEBLA<sup>1</sup>, M.BARBOZA-FLORES<sup>1</sup>, <sup>1</sup>BioNanoMed, Departamento de Investigación en Física. Universidad de Sonora, Hermosillo, Sonora, México; <sup>2</sup>Departamento de Física. Universidad de Sonora, Hermosillo, Sonora, México

#### FO:P08 Coating of Hydroxyapatite on the Surface-modified Polyetheretherketone

**N. SUZUKI**<sup>1</sup>, T. UMEDA<sup>1</sup>, H. KUWAHARA<sup>1</sup>, Y. MURASHI<sup>2</sup>, K. ITATANI<sup>1</sup>, <sup>1</sup>Department of Materials and Life Sciences, Sophia University, Tokyo, Japan; <sup>2</sup>2nd Department of Orthopaedic Surgery, Toho University, Tokyo, Japan

#### FO:P09 Tailoring the Surface of Alumina/Zirconia Composites by Organic/ Inorganic Treatments to Enhance their Bioactivity and Biocompatibility

**S. CAVALU**, V. SIMON, University of Oradea, Faculty of Medicine and Pharmacy, Oradea, Romania; Babes-Bolyai University, Faculty of Physics & Institute of Interdisciplinary Research in Bio-Nano-Sciences, Cluj-Napoca, Romania

#### FO:P10 Wear Behavior of Ti-6Al-7Nb Alloy for Total Hip Prosthesis

**M. LABAIZ**<sup>1</sup>, M. FELLAH<sup>1</sup>, O. ASSALA<sup>1</sup>, A. IOST<sup>2</sup>, <sup>1</sup>Laboratory of Metallurgy and Engineering Materials, BADJI Mokhtar- Annaba University, Algeria; <sup>2</sup>Arts et Métiers ParisTech, Lille, France

#### FO:P11 Residual Thermal Stress of Spinel Based-ceramic Infiltrated with Glass Rich in Lanthanum

**P. CIPRIANO DA SILVA**<sup>1,2</sup>, C. DOS SANTOS<sup>1,2</sup>, <sup>1</sup>Unifoa Centro Universitario de Volta Redonda, Volta Redonda, RJ, Brazil; <sup>2</sup>UERJ- FAT, Brazil

## Special Session FO-8

### SMART POLYMERS FOR BIOMEDICAL APPLICATIONS

### Oral Presentations

#### Session FO-8.1

#### Shape-memory and Shape-changing Polymers for Biomedical Applications

##### FO-8.1:IL01 Thermally Activated Shape Memory Polymers

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

##### 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

##### FO-8.1:IL03 Shape-memory Nanopatterns Direct Cell Orientation

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

##### FO-8.1:LO4 Scaffold Roughness Regulates the Endothelial Differentiation of Human Adipose Derived Mesenchymal Stem Cells

ZHENG DONG LI<sup>1,2</sup>, WEIWEI WANG<sup>1</sup>, K. KRATZ<sup>1,3</sup>, XUN XU<sup>1,2</sup>, M. ROCH<sup>1</sup>, A. KURTZ<sup>1</sup>, M. GOSSEN<sup>1</sup>, F. JUNG<sup>1,3</sup>, **NAN MA**<sup>1,3</sup>, A. LENDLEIN<sup>1,3</sup>, <sup>1</sup>Institute of Biomaterial Science and Berlin-Brandenburg Centre for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany; <sup>2</sup>Institute of Chemistry and Biochemistry, Free University of Berlin, Berlin, Germany; <sup>3</sup>Helmholtz Virtual Institute - Multifunctional Materials in Medicine, Berlin and Teltow, Germany

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

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

##### FO-8.1:LO6 Shape Memory Polymer Foams for Medical Device Applications

**T.S. WILSON**, Physical and Life Sciences Directorate, Lawrence Livermore National Laboratory, Livermore, CA, USA

##### 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

##### FO-8.1:LO8 Amphiphilic Shape Recovery Functional Nanocellulose Aerogels

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

## Session FO-8.2

## Light-sensitive Polymers for Biomedical Applications

**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

**FO-8.2:IL02 Multifunctionality of Mussel Inspired Adhesives**

**A. DEL CAMPO**, Max-Planck-Institut für Polymerforschung, Mainz, Germany

**FO-8.2:L03 Reversible Photochromic Polynorbornenes Bearing Spiropyran Side Groups for Layer-by-layer Coatings**

**L. FLOREA<sup>1</sup>**, **C. MOLONEY<sup>1</sup>**, **D. NIXON<sup>1</sup>**, **S. MOULTON<sup>2</sup>**, **G.W. WALLACE<sup>2</sup>**, **F. BENITO-LOPEZ<sup>1,3</sup>**, **D. DIAMOND<sup>1</sup>**, <sup>1</sup>INSIGHT, National Centre for Sensor Research, Dublin City University, Dublin, Ireland; <sup>2</sup>ARC Centre of Excellence for Electromaterials Science and Intelligent Polymer Research Institute, University of Wollongong; <sup>3</sup>CIC microGUNE, Arrasate-Mondragón, Spain

**FO-8.2:L04 Light-driven Polymer Nanowire for Cell Manipulation**

**J. LEE<sup>1</sup>**, **S. OH<sup>2</sup>**, **J. PYO<sup>1</sup>**, **J. KIM<sup>2</sup>**, **JUNG HO JE<sup>1</sup>**, <sup>1</sup>X-ray Imaging Center, Department of Materials Science and Engineering, Pohang University of Science & Technology, Pohang, Korea; <sup>2</sup>Institute of Nanoscience and Technology, Department of Chemical Engineering, Hanyang University, Seoul, Korea

**FO-8.2:L05 Chemo-responsive Polymer Networks Containing Coordination Crosslinks and Covalent Netpoints**

**P. ZHANG<sup>1,2,3</sup>**, **M. BEHL<sup>1,3</sup>**, **A. LENDLEIN<sup>1,2,3</sup>**, <sup>1</sup>Institute of Biomaterial Science and Berlin-Brandenburg Center for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany; <sup>2</sup>Institute of Chemistry, University of Potsdam, Potsdam, Germany; <sup>3</sup>Tianjin University-HZG Research Center Joint Laboratory for Biomaterials and Regenerative Medicine, Tianjin, China, and Teltow, Germany

## Session FO-8.3

## Smart Composites for Biomedical Applications

**FO-8.3:IL01 Polyurethane Based Shape-memory Polymers**

**WEI MIN HUANG**, Nanyang Technological University, Singapore

**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

**FO-8.3:L04 Glycopolymer Coated Gold Nanoparticle via RAFT Polymerization for Biosensing**

**Y. MIURA**, Kyushu University, Fukuoka, Japan

**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

**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

**FO-8.4:IL02 Aliphatic Poly(carbonate)s as Versatile Materials for Tissue Engineering**

**I.A. BARKER<sup>1</sup>**, **V.X. TRUONG<sup>1</sup>**, **S. TEMPELAAR<sup>1</sup>**, **L. MESPOUILLE<sup>2</sup>**, **M. TAN<sup>2</sup>**, **P. DUBOIS<sup>2</sup>**, **A.P. DOVE<sup>1</sup>**, <sup>1</sup>Department of Chemistry, University of Warwick, Coventry, UK; <sup>2</sup>Materials Research Institute, Center of Innovation and Research in Materials and Polymers (CIRMAP), Laboratory of Polymeric and Composite Materials, University of Mons, Mons, Belgium

**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

**FO-8.4:L04 Biodegradable Coating Loaded with Cephalexin on Magnesium Alloy for Biomedical Implants**

**A. ZOMORODIAN<sup>1</sup>**, **C. SANTOS<sup>1,2</sup>**, **M.J. CARMEZIM<sup>1,2</sup>**, **T. MOURA E SILVA<sup>1,3</sup>**, **J.C.S. FERNANDES<sup>1</sup>**, **M.F. MONTEMOR<sup>1</sup>**, <sup>1</sup>CEMS/DEQB, Instituto Superior Técnico, Technical University of Lisbon, Av. Rovisco Pais, Lisboa, Portugal; <sup>2</sup>Instituto Politécnico de Setúbal, DEM, ESTSetúbal, Portugal; <sup>3</sup>Instituto Superior de Engenharia de Lisboa, Dep. Mech. Engineering, DEM, Lisboa, Portugal

**FO-8.4:L05 Microparticles from Photocrosslinked Polyesters**

**F. FRIESS<sup>1,2</sup>**, **A. LENDLEIN<sup>1,2</sup>**, **C. WISCHKE<sup>1</sup>**, <sup>1</sup>Institute of Biomaterial Science and Berlin-Brandenburg Centre for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany; <sup>2</sup>Institute of Chemistry, University of Potsdam, Potsdam, Germany

**FO-8.4:IL06 Multifunctional Gene Nanoparticles to Mediate Proliferation and Migration of Human Vascular Endothelial Cells**

**YAKAI FENG<sup>1,2,3</sup>**, **CHANGCAN SHI<sup>1</sup>**, **QIAN LI<sup>1</sup>**, **JING YANG<sup>1</sup>**, **JUAN LV<sup>1</sup>**, **MUSAMMIR KHAN<sup>1</sup>**, **HAIXIA WANG<sup>1</sup>**, **XIANGKUI REN<sup>1</sup>**, **WENCHENG ZHANG<sup>4</sup>**, <sup>1</sup>School of Chemical Engineering and Technology, Tianjin University, Tianjin, China; <sup>2</sup>Key Laboratory of Systems Bioengineering of Ministry of Education, Tianjin University, Tianjin, China; <sup>3</sup>Tianjin University-Helmholtz-Zentrum Geesthacht, Joint Laboratory for Biomaterials and Regenerative Medicine, Tianjin, China; <sup>4</sup>Graduate School of Tianjin Medical University, Tianjin, China; <sup>5</sup>Department of Physiology and Pathophysiology, Logistics University of Chinese People's Armed Police Force, Tianjin, China

**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

**FO-8.4:L08 Biocompatibility 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

**FO-8.4:L09 Oligotetrahydrofurane Based Shape-memory Hydrogels**

**M. BALK<sup>1,2</sup>**, **M. BEHL<sup>1,2</sup>**, **U. NÖCHEL<sup>1</sup>**, **A. LENDLEIN<sup>1,2,3</sup>**, <sup>1</sup>Institute of Biomaterial Science, Helmholtz-Zentrum Geesthacht, Teltow, Germany; <sup>2</sup>Tianjin University - Helmholtz-Zentrum Geesthacht, Joint Laboratory for Biomaterials and Regenerative Medicine; <sup>3</sup>Berlin-Brandenburg Center for Regenerative Therapies (BCRT), Teltow, Germany

## Session FO-8.5

## Smart, Swollen Systems for Biomedical Applications

**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

**FO-8.5:IL02 Functional Thermo-responsive Nanogels for Biomedical Applications**

**M. CALDERON**, Institute of Chemistry and Biochemistry, Freie Universität Berlin, Berlin, Germany

**FO-8.5:L03 Star-shaped Oligo(Ethylene Glycols) Functionalized with Desaminytyrosine and Desamino Tyrosyl Tyrosine**

**K.K. JULICH-GRUNER**, **T. ROCH**, **A.T. NEFFE**, **A. LENDLEIN**, Institute of Biomaterial Science and Berlin-Brandenburg Center for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany

**FO-8.5:L04 Multi-functional Flexible Devices Based on PEDOT-PSS-ionic Liquid**

**H. RANDRIAMAHAZAKA<sup>1</sup>**, **H. OKUZAKI<sup>2</sup>**, <sup>1</sup>Université Paris Diderot, Sorbonne Paris Cité, ITODYS, UMR 7086 CNRS, Paris Cedex, France; <sup>2</sup>University of Yamanashi, Kofu, Japan

## Session FO-8.6

## Smart Polymers in Biomedical Applications

**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

**FO-8.6:IL02 The Engineering of a Somanaut: How to get from A to B in a Human Body**

**G. BATTAGLIA**, Department of Chemistry and The MRC/UCL Centre for Medical Molecular Virology, University College London, London, UK

**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**, Max Planck Institute for Polymer Research, Mainz, Germany

**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

**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. PIEMJAISWANG**, **S. YOUSATIT**, **V. LORY-UENYONG**, Department of Materials Science and Engineering, Faculty of Engineering and Industrial Technology, Silpakorn University, Nakhon Pathom, Thailand

**FO-8:P03 Bioactive Glasses/Ploxamer 407 Based Composites Systems for Delivery of Ropivacaine**

**R. BORGES**, **A.C.S. AKKARI**, **K.C. KAI**, **D.R. DE ARAUJO**, **J. MARCHI**, Centro de Ciências Naturais e Humanas, Universidade Federal do ABC, Santo André, SP, Brazil

**FO-8:P04 In Vitro Release Studies of Ploxamer - Calcium Phosphate - Ropivacaine Local Delivery System**

**K.C. KAI**, **A.C.S. AKKARI**, **J. MARCHI**, **D.R. DE ARAUJO**, Centro de Ciências Naturais e Humanas, Universidade Federal do ABC, Santo André, SP, Brazil

**FO-8:P06 Chitosan-g-oligo(epsilon-caprolactone) Polymeric Micelles as Drug Nanocarriers: Synthesis, Characterization and Rifampicin Encapsulation**

**S. QUINTANA**<sup>1,2</sup>, **R.J. GLISONI**<sup>1,2</sup>, **M.A. MOLINA SOLER**<sup>3</sup>, **A.G. MOGLIONI**<sup>1,2</sup>, **M. CALDERÓN**<sup>3</sup>, **A. SOSNIK**<sup>1,2,4</sup>, <sup>1</sup>Faculty of Pharmacy and Biochemistry, University of Buenos Aires, Buenos Aires, Argentina; <sup>2</sup>National Science Research Council (CONICET), Buenos Aires, Argentina; <sup>3</sup>Institute of Chemistry and Biochemistry, Free University of Berlin, Berlin, Germany; <sup>4</sup>Group of Pharmaceutical Nanomaterials Science, Department of Materials Science and Engineering, Technion, Haifa, Israel

**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 HONG**<sup>1</sup>, **J.H. RYU**<sup>2</sup>, **H. LEE**<sup>1</sup>, <sup>1</sup>Chemistry Department, KAIST, Daejeon, Republic of Korea; <sup>2</sup>Program 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

## Special Session FO-9

### WEARABLE AND IMPLANTABLE SENSORS AND BODY SENSOR NETWORKS

#### Oral Presentations

#### Session FO-9.1

##### Sensor Technology

**FO-9.1:IL02 A Wearable Computer Platform "Wewear" for Healthcare Monitoring**

**G.K. STYLIOS**, **L. LUO**, RIFLeX, Heriot Watt University, Galashiels, UK

**FO-9.1:L03 Durability Testing of Woven Pressure Sensors for Use in Emergency Equipment**

**P. BOSOWSKI**, **D. ERARSLAN**, **Y.-S. GLOY**, **T. GRIES**, **S. JOCKENHOEVEL**, RWTH Aachen, Germany

#### Session FO-9.2

##### Smart Fabrics and Wearables

**FO-9.2:IL01 Tools for Care of Elderly People**

**T. TAMURA**, Department of Biomedical Engineering, Osaka Electro-communication University, Neyagawa, Osaka, Japan

**FO-9.2:IL02 Electronic Textile Platforms for Monitoring in Physiological Parameter**

**R. PARADISO**, Smartex srl, Cascina (PI), Italy

**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

**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

**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

**FO-9.2:L06 Textile Based Wearable Sensors for Health Care Applications**

**K. EUFINGER**, **B. PAQUET**, **J. LEONARD**, CENTEXBEL, Chaineux, Belgium

#### Session FO-9.3

##### Wearable and Implantable Sensor Systems

**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

**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

**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

**FO-9.3:L04 Mobile Health: Design of In-body Wearable Sensor System by Flexible and Stretchable Electronics**

**C.C.Y. POON**<sup>1,2</sup>, **NINGQI LUO**<sup>2</sup>, **NI ZHAO**<sup>2</sup>, <sup>1</sup>Department of Surgery, The Chinese University of Hong Kong, HKSAR; <sup>2</sup>Department of Electronic Engineering, The Chinese University of Hong Kong, HKSAR



**FO-9.3:IL05 Wearable Microfluidics as New Tools for Bio- and Chemical Sensing**

**F. BENITO-LOPEZ**<sup>1,2</sup>, S. COYLE<sup>2</sup>, V.F. CURTO<sup>2</sup>, L. FLOREA<sup>2</sup>, D. DIAMOND<sup>2</sup>,  
<sup>1</sup>CIC microGUNE, Arrasate-Mondragón, Spain; <sup>2</sup>INSIGHT, National Centre for Sensor Research, Dublin City University, Ireland

**FO-9.3:IL06 Pervasive Sensors for Real Time Monitoring**

**F. DI FRANCESCO**<sup>1</sup>, P. SALVO<sup>1</sup>, N. CALISI<sup>1</sup>, B. MELAI<sup>1</sup>, S. GHIMENTI<sup>1</sup>, V. CASTELVETRO<sup>1</sup>, S. BIANCHI<sup>1</sup>, A. PUCCI<sup>1</sup>, C. CHIAPPE<sup>1</sup>, R. FUOCO<sup>1</sup>, M. CORREVEON<sup>2</sup>, G. DUDNIK<sup>2</sup>, G. VOIRIN<sup>2</sup>, I. TEXIER<sup>2</sup>, P. MARCOUX<sup>2</sup>, P. PHAM<sup>3</sup>, N. BUE<sup>4</sup>, J. CRISTENSEN<sup>4</sup>, M. LAURENZA<sup>5,6</sup>, A. RAPTOPOULOS<sup>7</sup>, A. BARTZAS<sup>7</sup>, D. SOUDRIS<sup>8</sup>, C. SAXBY<sup>9</sup>, T. NAVARRO<sup>10</sup>, M. ROMANELLI<sup>11</sup>, V. DINI<sup>11</sup>, A. PAOLICCHI<sup>12</sup>, M. MULLER<sup>13</sup>, P-Y. BENHAMOU<sup>13</sup>, L. LYMPEROPOULOS<sup>7</sup>,  
<sup>1</sup>University of Pisa, Dipartimento di Chimica e Chimica Industriale, Pisa, Italy; <sup>2</sup>Centre Suisse d'Electronique et de Microtechnique, Neuchâtel, Switzerland; <sup>3</sup>CEA Leti, MINATEC Campus, Grenoble, France; <sup>4</sup>European Wound Management Association, Frederiksberg, Denmark; <sup>5</sup>Euroresearch, Milano, Italy; <sup>6</sup>Haemopharm Biofluids, Tovo di S. Agata, Italy; <sup>7</sup>EXUS, Athens, Greece; <sup>8</sup>National Technical University of Athens / ICCS, School of Electrical & Computer Engineering, Athens, Greece; <sup>9</sup>Smith and Nephew Wound Management, Hull, UK; <sup>10</sup>Swissinnov, Gland, Switzerland; <sup>11</sup>University of Pisa, Wound healing research unit, Clinica Dermatologica, Pisa, Italy; <sup>12</sup>University of Pisa, Department of Translational Research and New Technologies in Medicine and Surgery, Pisa, Italy; <sup>13</sup>Clinique d'Endocrinologie Diabetologie, Pôle DigiDune, CHU de Grenoble, Grenoble, France

**FO-9.3:L07 Soft Conductive Polymer Dry Electrodes for High-quality and Comfortable ECG/EEG Measurements**

**YUN-HSUAN CHEN**<sup>1</sup>, M. OP DE BEECK<sup>2</sup>, L. VANDERHEYDEN<sup>3</sup>, H. VANDORMAEL<sup>3</sup>, C. VAN HOOFF<sup>1</sup>,  
<sup>1</sup>Imec & Electrical Engineering Department, KU Leuven, both at Leuven, Belgium; <sup>2</sup>imec, Leuven, Belgium; <sup>3</sup>Department of R&D and Innovation, Datwyler Sealing Solutions, Alken, Belgium

**FO-9.3:L08 Electro-textile for Embedded Data and Power Networks in Combat Uniforms**

**J. DUMAS**, Defense R&D Canada - Valcartier, Quebec, Canada

## Session FO-9.4

## Energy Harvesting and Management

**FO-9.4:IL01 Flexible Batteries and Electroactive Fibers for Smart Textiles**

**M. SKOROBOGATIY**, Canada Research Chair in Micro and Nanophotonics Génie Physique, Ecole Polytechnique de Montréal, Montréal, Canada

**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

**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

**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

## Session FO-9.5

## Antennas, Data Transmission, Signal Processing

**FO-9.5:IL01 Textile-based Antennas**

**C. HERTLEER**, Ghent University, Dept. of Textiles, Zwijnaarde, Belgium; H. ROGIER, Ghent University, Dept. of Information Technology, Belgium

**FO-9.5:IL02 Combination of Body Sensor Networks and On-body Signal Processing Algorithms**

**J. LUPRANO**, CSEM SA, Neuchâtel, Switzerland

**FO-9.5:IL03 Kinematics Analysis of Human Movement with Wearable Sensors - A Multiple-modality Approach**

**LEI WANG**, Shenzhen Institutes of Advanced Technology, CAS, Shenzhen Low-cost Healthcare Lab., Shenzhen, China

**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

## Poster Presentation

**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