SCIENTIFIC PROGRAMME

5th FORUM ON NEW MATERIALS

OPENING SESSION

WELCOME ADDRESSES

Plenary Lectures

F:PL1 **Graphene: Magic of Flat Carbon**
A. GEIM, University of Manchester, UK

F:PL2 **Programmed Molecular Assembly for Tailored Functional Materials**
T. AIDA, JST ERATO-SORST NANOSPACE PROJECT, Center for Nanobio Integration, and Dept. of Chemistry & Biotechnology, The University of Tokyo, Tokyo, Japan

F:PL3 **First Principles Multiscale Methods Applied to Materials Science**
W.A. GODDARD, III, Materials and Process Simulation Center (MSC), California Institute of Technology, Pasadena, CA, USA

SYMPOSIUM FA

ADVANCED FOSSIL FUEL ENERGY TECHNOLOGIES: THE MATERIALS DEMAND

Oral Presentations

Session FA-1
Fossil Fuel Combustion

FA-1.1 Improved or New Materials

FA-1.1:IL01 **Materials Issues in Oxy-fuel Technology for Carbon Capture and Storage**
T. WALL, Chemical Engineering, University of Newcastle, Callaghan, NSW, Australia

FA-1.1:IL02 **New Metallic Materials for Advanced Fossil Fuel Power Generation**
W.J. QUADAKKERS, Forschungszentrum Jülich, IEF2, Jülich, Germany

FA-1.1:IL03 **Materials Design of Ni Base Superalloy for 700 °C-class Steam Turbine**
S. IMANO, J. SATO, Material Research Laboratory, Hitachi, Ltd, Hitachi-shi, Japan

FA-1.1:IL04 **Control of Microstructure and Defects in Cast TiAl**
R. YANG, Y.Y. CUI, Q. JIA, R.H. LIU, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China

FA-1.1:IL05 **Directional Solidification by Liquid Metal Cooling Process**
J. SHEN, **J. ZHANG**, L.H. HONG, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China

FA-1.1:IL06 **Long-term Stabilization of Creep-resistant Ferritic Steels forHighly Efficient Ultra-supercritical Power Plants**
FUJIO ABE, National Institute for Materials Science (NIMS), Tsukuba, Japan

FA-1.1:IL07 **Simplified Processing of Oxide Dispersion Strengthened (ODS) Ferritic Alloys using Gas Atomized Precursor Powders**
I.E. ANDERSON[1,2], J.R. RIEKEN[2], M.J. KRAMER[1], D. SHECHTMAN[2], M.F. BESSER[1]; [1]Division of Matls Sci. and Eng., Ames Lab. (USDOE), Ames, Iowa, USA; [2]Material Sci. and Eng. Dept., Iowa State University, Ames, Iowa, USA

FA-1.1:IL08 **Recent Developments Towards the Application of Iron Aluminides in Fossil Fuel Technologies**
D.G. MORRIS, M.A. MUÑOZ-MORRIS, Dept. of Physical Metallurgy, CENIM, CSIC, Madrid, Spain

FA-1.1:IL09 **Alloy Design and Processing Challenges for Advanced Power Systems: an Alloy Producer's Perspective**
G.E. MAURER, A.D. PATEL, Carpenter Technology Corporation, Reading, PA, USA

FA-1.1:IL10 **Computational and Experimental Development of Novel High Temperature Alloys**
M.J. KRAMER, M. AKINC, P. RAY, Ames Laboratory and Dept. of Materials Science and Engineering, Iowa State University, Ames, Iowa, USA

FA-1.1:IL11 **Alloy Selection for Advanced Ultrasupercritical (A-USC) Combustion Systems**
J. SHINGLEDECKER, **D. GANDY**, R. VISWANATHAN, Electric Power Research Institute (EPRI), Charlotte, NC, USA

FA-1.1:L12 **Reaction Synthesis Mo-Si-B Alloys; Strength, Oxidation, Microstructural Engineering**
J.K. COCHRAN, M.R. MIDDLEMAS, W.L. DALOZ, P.E. MARSHALL, Georgia Tech, Atlanta, GA, USA; K.S. KUMAR, P. JAIN, Brown University, Providence, RI, USA

FA-1.1:L13 **Effect of Alloying Elements on Phase Equilibria in New Co-based Superalloy**
T. OMORI, J. SATO, K. OIKAWA, I. OHNUMA, R. KAINUMA, K. ISHIDA, Dept. of Materials Science, Tohoku University, Sendai, Japan

FA-1.2 Membranes for O_2 Separation and Adsorbents for CO_2 Capture

FA-1.2:IL01 **Oxygen Transport Membranes for Oxyfuel Combustion**
W. HAIJE, Energy Research Centre of the Netherlands, ECN, Petten, The Netherlands

FA-1.2:IL02 **Commercially Reliable Oxygen Conducting Membranes for SOFC and Oxygen Generation Applications**
V. SPRENKLE, Pacific Northwest National Laboratory (PNNL), Richland, WA, USA

FA-1.2:IL03 **Oxygen Carriers for Chemical-looping Combustion**
T. MATTISSON, A. LYNGFELT, Dept. of Energy and Environment, Chalmers University of Technology, Göteborg, Sweden

FA-1.2:L04 **Supported Oxygen Transport Membranes for Oxyfuel Power Plants**
M. BETZ, F. SCHULZE-KÜPPERS, S. BAUMANN, W.A. MEULENBERG, D. STÖVER, Forschungszentrum Jülich, Institute of Energy Research IEF-1 Materials Synthesis and Processing, Jülich, Germany

FA-1.2:IL05 **Adsorbents for CO2 Capture in Fossil Fuel Combustion Plants**
H. GEERLINGS, Delft University of Technology, Dept. of Chemical Eng. Materials for Energy Conversion and Storage, Delft, The Netherlands

FA-1.2:IL06 **Nanostructured Organic-inorganic Hybrid Aminosilicas for CO2 Capture from Dilute Gas Streams**
J.H. DRESE[1], SUNHO CHOI[1], P. BOLLINI[1], MCMAHAN L. GRAY[2], **C.W. JONES**[1], [1]School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, GA, USA; [2]U.S. Dept. of Energy, National Energy Technology Laboratory, Pittsburgh, PA, USA

FA-1.2:IL07 **High-temperature CO2 Sorbents for Pre-combustion CO2 Capture**
R.W. VAN DEN BRINK, E.R. VAN SELOW, P.D. COBDEN, S. WALSPURGER, W.G. HAIJE, Energy Research Centre of the Netherlands (ECN), Petten, The Netherlands

FA-1.2:IL08 **Designing New Microporous Framework Materials for CO2 Capture**
R.G. BELL, A. TORRISI, C. MELLOT-DRAZNIEKS, Dept. of Chemistry, University College London, London, UK

FA-1.3 Thermal and Protective Coatings

FA-1.3:IL01 **Self Diagnostic EB-PVD Thermal Barrier Coatings**
J.R. NICHOLLS, R.G. WELLMAN, R.STEENBAKKER, Cranfield University, Cranfield, Bedford, UK; J.P. FEIST, STS Ltd, c/o Imperial College, London, UK

FA-1.3:IL02 **Development of Metallic and Ceramic Slurry Coatings for Materials in Severe Environments**
B.L. ARMSTRONG, K.M. COOLEY, J.J. HENRY, L.R. WALKER, B.A. PINT, Oak Ridge National Laboratory, Oak Ridge, TN, USA

FA-1.3:IL03 **Inhibition of Interdiffusion in NiCrAlY Coated g-TiAl by Introduction of a Yttria Partially Stabilized Zirconia(PYSZ) Layer**
FUHUI WANG, YUXIAN CHENG, WEN WANG, State Key Laboratory for Corrosion and Protection, Institute of Metal Research, CAS, Shenyang, China

FA-1.4 Long-term Creep and Fatigue

FA-1.4:IL01 **Long-term Mechanical Stability in USC Steam Turbine Environments**
J.A. HAWK, USDOE, NETL, Albany, OR, USA

FA-1.4:IL02 **Degradation of Ni-Base Superalloys under High Temperature Creep Conditions**
A. EPISHIN, T. LINK, Technical University of Berlin, Berlin, Germany; B. FEDELICH, H. KLINGELHÖFFER, Federal Institute for Materials Research and Testing, Berlin, Germany; M. NAZMY, M. STAUBLI, ALSTOM Ltd., Baden, Switzerland

FA-1.4:IL03 **Creep Resistent Steels for Coal Power Plant Applications**
R. VISWANATHAN, Electric Power Research Institute, Palo Alto, CA, USA

FA-1.5 Corrosion and Erosion

FA-1.5:IL01 **Materials Performance in Advanced Steam Cycle and Oxy-fuel Combustion Systems**
K. NATESAN, Z. ZENG, Argonne National Laboratory, Argonne, IL, USA

FA-1.5:IL02 **Modelling Solid Particle Erosion of Steels at Elevated Temperatures: A New Approach to CFD Modelling in 3-Dimensions**
M.M. STACK, S.M. ABDELRAHMAN, B.D JANA, Dept. of Mechanical Engineeering, University of Strathclyde, Glasgow, UK

FA-1.5:IL03 **Important Compositional and Microstructural Factors Affecting the High-Temperature Degradation of Metallic Alloys and Coatings**
B. GLEESON, University of Pittsburgh, Dept. Mechanical Engineering & Materials Science, Pittsburgh, PA, USA

FA-1.5:L04 **Electrochemical Investigation on Hot Corrosion of Inconel 740 Alloy in Simulated Coal Ash Environment**
YINGLU JIANG, **XINGBO LIU**, Mechanical & Aerospace Engineering Dept., West Virginia University Morgantown, WV, USA

FA-1.5:L05 **Pilot Scale Studies of the Fireside Corrosion Effects of Biomass Co-Firing and / or Oxyfuel Coal Firing**
C.J. DAVIS, L.W. PINDER, E.ON Engineering, Nottingham, UK

Session FA-2
Gasification and Gas Clean-up

FA-2.1 Catalysts for Water-gas Shift and for Fuel Production

FA-2.1:IL01 **New Ways of Understanding Site Structure and Function in Fuel Production Catalysts**
J.P.H. LI, I. SULEIMAN, A. STAFFORD, **M. STOCKENHUBER**, University of Newcastle, Chemical Engineering, Priority Research Centre for Energy, Callaghan, NSW, Australia

FA-2.1:IL02 **Water Gas Shift Reaction: From Conventional Catalytic Systems to Pd-based Membrane Reactors**
A. BASILE, A. IULIANELLI, ITM-CNR, c/o University of Calabria, Rende (CS), Italy

FA-2.1:IL02 **Reactors with Integrated Separation by Membranes**
O. GÖRKE, J. THORMANN, P. PIERMARTINI, P. PFEIFER, **R. DITTMEYER**, Institute for Micro Process Engineering (IMVT), Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

FA-2.2 Membranes for H_2 Separation and CO_2-selective Membranes

FA-2.2:IL01 **Carbon Molecular Sieve Membranes for H2 - CO2 Separation**
M.-B. HÄGG, J. ARVID LIE, QIANG YU, Dep. Chem. Eng., Norwegian University of Science and Technology

FA-2.2:IL02 **Synthesis and Characterization of Zeolite and Nanophase Ceramic Membranes for High Temperature Applications**
A. JULBE, A. AYRAL, V. ROUESSAC, S. ROUALDES, Institut Européen des Membranes, Université Montpellier 2, Montpellier, France

FA-2.2:IL03 **Non-Pd Alloy Membranes for H2/CO2 Separation**
M.D. DOLAN, CSIRO Energy Technology, Brisbane, QLD, Australia

FA-2.2:L04 **First Principles Calculations of Hydrogen Diffusion in Metal Hydrides, Metal Alloys, and Amorphous Metals**
D.S. SHOLL, SHIQIANG HAO, School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, USA

FA-2.2:IL05 **Ceramic Membranes in Carbon Dioxide Capture: Applications and Potentialities**
E. DRIOLI[1,2], A. BRUNETTI[1], G. BARBIERI[1], [1]ITM-CNR, c/o The University of Calabria, Rende (CS), Italy; [2]The University of Calabria, Dept. of Chemical Engineering and Materials, Rende (CS), Italy

FA-2.2:IL06 **High Temperature Polymer-based Membranes for Hydrogen Purification and Carbon Capture**
K.A. BERCHTOLD, K.W. DUDECK, R.P. SINGH, D. ORTIZ-ACOSTA, C.F. WELCH, B.M. PATTERSON, Los Alamos National Laboratory, Los Alamos, NM, USA

FA-2.2:IL07 **PdCu Membranes for Hydrogen Separation: Stability and Application Ranges**
A. GOLDBACH, L.X. YUAN, H.Y. XU, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, P.R. China

FA-2.2:IL08 **Computational Design of Pd-based Alloys for Membranes for Hydrogen Gas Separation**
A.J. BÖTTGER, D.E. NANU, Delft University of Technology, Materials Science and Engineering, Delft, The Netherlands

FA-2.3 High Temperature Seals

FA-2.3:IL01 **High Temperature Seals for Membrane Reactor Modules**
R. DONELSON, CSIRO, Melbourne, Victoria, Australia; M. DOLAN, CSIRO Pullenvale, Queensland, Australia

FA-2.3:IL02 **Development of Friction Stir Welding Technology High-temperature Power Generation Applications**
K.S. WEIL, G.J. GRANT, Y. HOVANSKI, J.T. DARSELL, Pacific Northwest National Laboratory, Richland, WA, USA

Poster Presentations

FA:P01 **Comparison of High Temperature Mechanical Behaviour and Microstructure of the New Gamma-TiAl8Ta with Gamma-TiAl8Nb Alloy**
G. ANGELLA, V. LUPINC, M. MALDINI, **G. ONOFRIO**, CNR-IENI, Milano, Italy

FA:P02 **Elaboration and Characterization of the Properties of Refractory Cr Base Alloys**
L. ROYER, S. MATHIEU, **P. STEINMETZ**, Institut Jean Lamour, Faculté des Sciences et Techniques, Vandoeuvre Cedex, France; C. LIEBAUT, SEVA, Chalon-Sur-Saone Cedex, France

FA:P03 **Hydrogen Uptake and Hydrogen Profiles in Chromia Scales Formed in High and Low pO_2 Test Gases at 1000 °C**
L. GARCIA-FRESNILLO, S.L. TOBING, **M. HÄNSEL**, V. SHEMET, U. BREUER, L. SINGHEISER, W.J. QUADAKKERS, Forschungszentrum Jülich, IEF-2, Jülich, Germany

FA:P04 **Novel Oxygen Ion Transport LGBS Membranes**
V.V. BELOUSOV, S.V. FEDOROV, A.V. VOROBIEV, A.A. Baikov Institute of Metallurgy and Materials, Russian Academy of Sciences, Moscow, Russia

FA:P05 **Synthesis and Characterization of Ceramic Material for CO_2 Fixation - An Experimental and Theoretical Study**
F.A. VIEIRA, G.P. VOGA, I.G. CARVALHO, R. DE OLIVEIRA, G.M. DE LIMA, **J.C. BELCHIOR**, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil

FA:P06 **Effects of Firing Conditions on the Coal Ash Melting Behaviour**
D. MONTINARO, G. DI SALVIA, M. MALAVASI, ITEA SpA, Gioia del Colle, Italy; G. AMANTE, A. CHIECHI, A. LICCIULLI, Università del Salento, Dipartimento Ingegneria dell'Innovazione, Lecce, Italy

FA:P07 **Viscosity Under Pressure Mixtures of Hydrocarbons: A Critical Model Reported Double Reference**
A. ETTAHIR, Lab. de l'Energétique, des Matériaux et de l'Environnement, EST Salé, Université Mohammed V Agdal, Maroc; C. BONED, B. LAGOURETTE, LFC Université de Pau, France

FA:P08 **CO Oxidation on CeO2 and CuO/CeO2 Catalysts Exposing Different Ceria Crystal Planes**
D. GAMARRA, A. MARTÍNEZ-ARIAS, J.C. CONESA, Instituto de Catálisis y Petroleoquímica, CSIC, Madrid, Spain

FA:P09 **Ionic Liquid Absorbents for CO2 Capture**
J. HUANG, H. LIU, A. ROSAMILIA, T. RUETHER, Z. ZHANG, CSIRO Energy Technology, Clayton, VIC, Australia

SYMPOSIUM FB

MATERIALS AND PROCESS INNOVATIONS IN HYDROGEN PRODUCTION AND STORAGE

Oral Presentations

Session FB-1
Hydrogen Production

FB-1.1 Thermochemical H_2 Production

FB-1.1:IL01 **State-of-the-art of Thermo-chemical Hydrogen Production**
J. KELLER, Hydrogen and Combustion Technologies, Sandia National Laboratories, Livermore, CA, USA

FB-1.1:IL02 **Hydrogen Production by the Thermochemical Cycle Based on Mixed Na-Mn Ferrites**
C. ALVANI, A. LA BARBERA, F. PADELLA, **F. VARSANO**, ENEA - C.R. Casaccia, Rome, Italy

FB-1.1:IL03 **Two-step Thermochemical Cycles for High-temperature Solar Hydrogen Production**
T. KODAMA, Dept. of Chemistry & Chem. Eng., Niigata Univ., Niigata, Japan

FB-1.1:L04 **Coupling a Biomass Gasification Plant with the NIS Thermochemical Cycle for Hydrogen Production**
P.P. PROSINI, G. CAPUTO, A. GIACONIA, S. SAU, ENEA, Rome, Italy

FB-1.2 Photoelectrochemical and Photobiological H_2 Production

FB-1.2:IL01 **Development of Photocatalysts for Water Splitting Under Visible Light**
K. DOMEN, School of Engineering, The University of Tokyo, Tokyo, Japan

FB-1.2:IL02 **Defect-related Properties of Photosensitive Oxide Semiconductors for Solar Hydrogen**
S. LI, School of Materials Science & Engineering, University of New South Wales, Sydney, NSW, Australia; J. NOWOTNY, Solar Energy Technologies, University of Western Sydney, Penrith South DC NSW, Australia

FB-1.2:IL03 **Photoelectrochemistry of Complex Metal Oxides**
R. VAN DE KROL, Dept. of DelftChemTech, Delft University of Technology, Delft, The Netherlands

FB-1.2:IL04 **Hybrid Assemblies for Solar-driven Hydrogen Production**
K. BROWN, D. SVEDRUZIC, J. BLACKBURN, S. DAYAL, G. RUMBLES, M.L. GHIRARDI, **P.W. KING**, National Renewable Energy Laboratory, Golden, CO, USA; M. HEBEN, University of Toledo, Toledo, OH, USA

FB-1.2:IL05 **Bio-inspired Approaches to Solar Hydrogen Production**
D. GUST, T.A. MOORE, A.L. MOORE, Dept. of Chemistry and Biochemistry, Arizona State University, Tempe, AZ, USA

FB-1.3 H2 Production from Biomass Reforming, Electrolysis and Water-gas Shift in Advanced Coal Gasification (Joint Session with Symposium FA)

FB-1.3:IL01 **Materials Issues in High Temperature Solid-oxide Electrolyzers for Large-scale Efficient Hydrogen Production**
J. HARTVIGSEN, S. ELANGOVAN, Ceramatec, Inc., Salt Lake City, UT, USA

FB-1.3:IL02 **High Temperature Water Electrolysis Using Metal Supported Solid Oxide Electrolyzer Cells (SOEC)**
G. SCHILLER, A. ANSAR, O. PATZ, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Technische Thermodynamik, Stuttgart, Germany

FB-1.3:L03 **Design and Thermal Characterisation of a Hydrogen Reactor for Low Power PEM Fuel Cell Applications**
J. KOSTKA[1], C. LIEBOLD[2], T. SMOLINKA[1], F. MERTENS[2]; [1]Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, Germany; [2]Technical University Bergakademie Freiberg, Institute for Physical Chemistry, Freiberg, Germany

FB-1.3:IL04 **Catalysts and Syngas Treatment for Water-gas Shift in Advanced Coal Gasification Cycles**
D.L. KING, LIYU LI, C. VALKENBURG, Energy and Environment Directorate, Pacific Northwest National Laboratory, Richland, WA, USA

FB-1.3:IL05 **Combined Hydrogen and Power Production from Coal**
G. SPAZZAFUMO, University of Cassino, Cassino, Italy

FB-1.3:L06 **Selection of Ceramics and Composites as Materials for a Supercritical Water Gasification (SCWG) Reactor**
T. RICHARD, J. POIRIER, CEMHTI-CNRS Orleans, France; C. AYMONIER, A. SERANI, ICMCB-CNRS Bordeaux, France

Session FB-2
Hydrogen Storage

FB-2.2 Metal Hydrides

FB-2.2:IL01 **Hydrogen Storage in Metastable Lightweight Hydrides**
K. KADIR, D. MOSER, **D. NOREUS**, Structural Chemistry, Stockholm University, Stockholm, Sweden

FB-2.2:IL02 **Developments in Magnesium-based Hydrides**
J. HUOT, Hydrogen Research Institute, Université du Quebec a Trois-Rivieres, Trois-Rivieres, Quebec, Canada

FB-2.2:IL03 **Hydrogen Storage in Destabilized Borohydride Materials**
A.J. GOUDY, A. IBIKUNLE, T. DUROJAIYE, Dept. of Chemistry, Delaware State University, Dover, DE, USA

FB-2.2:IL04 **Computational Modelling of Destabilized Hydride Systems**
J.K. JOHNSON, A, KULKARNI, University of Pittsburgh, Pittsburgh, PA, USA; KI CHUL KIM, D. SHOLL, Georgia Institute of Technology, USA

FB-2.2:IL05 **Destabilization of Mg Hydrides by Mechanical Constraint**
R. GRIESSEN, A. BALDI, Y. PIVAK, Dept. of Physics and Astronomy, Condensed Matter Physics, VU University Amsterdam, Amsterdam, The Netherlands

FB-2.2:L06 **From Lab Scale Optimization of Mg-based Composites for H2 Storage to the Realization of a Portable Prototype**
C. MILANESE, A. GIRELLA, G. BRUNI, V. BERBENNI, A. MARINI, CSGI - Dept. of Physical Chemistry, University of Pavia, Pavia, Italy; P. MATTEAZZI, MBN Nanomaterialia S.p.A., Vascon di Carbonera (TV), Italy

FB-2.2:L07 **In-situ Study of the Effect of Internal Stress on the Hydriding Kinetics of Pd-based Thin Film Systems**
R. DELMELLE, S. MICHOTTE, J. PROOST, Inst. of Mechanics, Materials and Civil Eng., Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium

FB-2.2:IL08 **Size-selected Rare Earth and Palladium Nanoparticles for Hydrogen induced Switching and Sensing Devices**
B.R. MEHTA, Department of Physics, Indian Institute of Technology Delhi, New Delhi, India

FB-2.2:L09 **Effect of Nanostructuring on the Hydrogen Storage Properties of LaNi5 Systems**
B. JOSEPH[1], **B. SCHIAVO**[2, 3], G. D'ALÌ STAITI[2, 3], N.L. SAINI[1], [1]Dipartimento di Fisica, Universita' di Roma "La Sapienza", Italy; [2]Dipartimento di Fisica e Tecnologie Relative (DIFTER), Universita' di Palermo, Italy; [3]Istituto Tecnologie Avanzate (ITA), Trapani, Italy

FB-2.2:L10 **Transmission Electron Microscopy of Materials for Hydrogen Storage**
K. WANG, **L.A. BENDERSKY**, Materials Science and Engineering Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, USA

FB-2.2:L12 **On the Nucleation Step in the Mg-MgH2 Phase Transformation**
A. AURORA, M. VITTORI ANTISARI, A. MONTONE, D. MIRABILE GATTIA, F. PIERDOMINICI, ENEA, Research Centre of Casaccia, Rome, Italy

FB-2.2:L13 **Ball Milling in the Mg-Ti-H System**
D.P. WESTON, G. WALKER, D. GRANT, Dept. of M3, University of Nottingham, Nottingham, UK

FB-2.2:L14 **Pellets of MgH2-based Composites as Practical Material for Solid State Hydrogen Storage**
A. KHANDELWAL, F. AGRESTI, G. CAPURSO, A. MADDALENA, **G. PRINCIPI**, Dip. Ingegneria Meccanica, Settore Materiali, Univ. Padova, Italy; S. LO RUSSO, Dip. Fisica and CNISM, Univ. Padova, Italy; S. GIALANELLA, Dip. Ingegneria dei Materiali e Tecnologie Industriali, Univ. Trento, Mesiano, Trento, Italy

FB-2.3 Complex Hydrides

FB-2.3:IL01 **Achievements and Perspectives of the US National Program on Hydrogen Storage**
N. STETSON, C. READ, G. ORDAZ, M. GARDNER, S. DILLICH, Office of Energy Efficiency and Renewable Energy, EE-2H, U.S. Department of Energy (U.S. DOE), Washington, DC, USA

FB-2.3:IL02 **Hydrogen Sorption Characteristics of Group I & II Borohydrides and Hydride Composites**
Y.-S. LEE, J.-H. SHIM, **Y.W. CHO**, Korea Institute of Science and Technology, Cheongryang, Seoul, Korea

FB-2.3:IL03 **LiBh4 - A Versatile Hydrogen Storage Compound**
W.I.F. DAVID, ISIS Facility, Rutherford Appleton Laboratory, Chilton, UK

FB-2.3:IL04 **Microwave Absorption and Lithium Super-Ionic Conduction in Lithium Borohydride LiBH4**
M. MATSUO, S. ORIMO, Institute for Materials Research, Tohoku University, Sendai, Japan

FB-2.3:IL05 **Electrochemical Formation and Regeneration of Alane**
R. ZIDAN, B.L. GARCIA-DIAZ, C.S. FEWOX, Savannah Rivers National Laboratory, Aiken, SC, USA

FB-2.3:IL06 **Hydrogen Storage Materials - Recent Development and Future Strategy of Japan**
E. AKIBA, AIST, Tsukuba, Ibaraki, Japan

FB-2.3:IL07 **Evidence for Hydrogen Transport in Deuterated LiBH4 from Low-temperature Raman-scattering Measurements and First-principles Calculations**
A. BORGSCHULTE, Laboratory 138 Hydrogen & Energy, Empa - Materials Science & Technology, Dübendorf, Switzerland

FB-2.3:IL08 **Approaches to Modify Complex Hydrides Towards Viable Onboard Hydrogen Storage**
R. MOHTADI, P.K. SIVASUBRAMANIAN, Toyota Research Institute of North America, Ann Arbor, MI, USA; T. MATSUNAGA, Toyota Motor Corporation; J. GRAY, D. KNIGHT, R. ZIDAN, Savannah River National Laboratory, USA

FB-2.3:L09 **Synthesis and Characterisation of Ca(BH4)2 for Solid State Hydrogen Storage**
C. RONGEAT, A. BORGSCHULTE, A. ZÜTTEL, L. SCHULTZ, O. GUTFLEISCH, IFW Dresden, Institute for Metallic Materials, Dresden, Germany, and EMPA, Laboratory for Hydrogen and Energy, Duebendorf, Switzerland

FB-2.3:L10 **Thermochemical Transformations in 2Li(Na)NH2-3MgH2 Systems**
O. DOLOTKO, V.K. PECHARSKY, Ames Lab., U.S. Dept. of Energy, Iowa State University, Ames, IA, USA; N. PAULSON, Olin College, Needham, MA, USA

FB-2.3:L11 **Proton Vibrations in Lithium Imide Studied Through Incoherent Inelastic Neutron Scattering**
D. COLOGNESI, ISC-CNR, Sesto Fiorentino (FI), Italy; A. PIETROPAOLO, Univ. Milano Bicocca, Dip.to di Fisica "G. Occhialini", Milano, Italy; A.J. RAMIREZ-CUESTA, STFC, Rutherford Appleton Lab., Chilton, Didcot, UK

FB-2.3:L12 **Improved Cyclability of Titanium Catalysed Multicomponent LiBH4-LiAlH4 System for Hydrogen Storage**
M. MEGGOUH, G.S. WALKER, D.M. GRANT, Engineering Faculty, University of Nottingham, Nottingham, UK

FB-2.3:L13 **Hydrogen Storage Research Activities in ENEA**
P.P. PROSINI, **P. GISLON**, M. CONTE, ENEA, Rome, Italy

FB-2.3:L14 **Low Temperature Hydrogen Release from LiBH4-based Multicomponent Systems**
WEINA YANG[1], D.M. GRANT[1], XUEBIN YU[2], G.S. WALKER[1], [1]Div. of Fuels and Power Technology, University of Nottingham, University Park, Nottingham, UK; [2]Dept. of Materials Science, Fudan University, Shanghai, China

FB-2.3:L15 **Sorption Reactions of NaBH4-MgH2 Composite**
D. POTTMAIER, S. GARRONI, A. CASTELLERO, M.D. BARO, M. BARICCO, Università di Torino, Turin, Italy; Universidad Autonoma de Barcelona, Barcelona, Spain

FB-2.3:L16 **Ternary Phase Destabilized Complex Hydrides: LiBH4:MgH2:LiAlH4**
T.E.C. PRICE, D.M. GRANT, G.S. WALKER, University of Nottingham, Division of Fuels and Power Technology, University Park, Nottingham, UK; T.C. HANSEN, Institut Laue Langevin, Grenoble, France

FB-2.3:L17 **Decomposition of Ammoniaborane (NH3BH3) at Sub-Ambient Pressures**
R. CANTELLI, P. RISPOLI, Sapienza Università di Roma, Roma, Italy; O. PALUMBO, ISC-CNR and Sapienza Università di Roma, Roma, Italy; A. PAOLONE, Lab. Regionale SuperMAT, CNR-INFM, Salerno, and Sapienza Università di Roma, Roma, Italy; T. AUTREY, PNNL, Richland, WA, USA

FB-2.4 Chemical Hydrides

FB-2.4:IL01 **Synthesis and Properties of Nanocomposites Based on Tetrahydroborates**
M. FICHTNER, Institute of Nanotechnology, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

FB-2.4:IL02 **Catalyzed Dehydrogenation of Amine-borane Fuel Blends**
R.T. BAKER, Dept. of Chemistry and Centre for Catalysis Research and Innovation, University of Ottawa, Ottawa, Canada

FB-2.4:IL03 **Chemical Hydrogen Storage in NHXBHX Materials**
T. AUTREY, Fundamental Sciences Directorate, Pacific Northwest National Laboratory, Richland, WA, USA

FB-2.4:L04 **The "Boron Effect" on the Dehydrogenation of Light Metal Borohydrides**
F. PENDOLINO, A. ZÜTTEL, Empa Materials Sciences and Technology, Dübendorf, Switzerland; S. GARRONI, D. BARO, Dpto de Fisica, Universitat Autonoma de Barcelona, Bellaterra, Spain; C. MILANESE, A. GIRELLA, A. MARINI, CSGI - Dept. of Physical Chemistry, University of Pavia, Pavia, Italy

FB-2.5 Carbon Based Materials

FB-2.5:IL01 **Hydrogen Storage in Nanoporous Structures**
R. CHAHINE[1], M.-A. RICHARD[1], D. MORI[2], K. HIROSE[2], [1]Institut de Recherche sur l'Hydrogene, Universite du Quebec a Trois-Rivieres, Quebec, Canada; [2]Toyota Motor Corp., Fuel Cell System Development Div., Shizuoka, Japan

FB-2.5:IL02 **Neutron Scattering Studies of Hydrogen Storage Materials**
D.K. ROSS, D.J. BULL, D. MOSER, D. ROACH, Z. MILEEVA, I. SHABALIN, W.A. OATES, Inst. for Materials Research, Univ. of Salford, Manchester, UK

FB-2.5:IL03 **Novel Catalytic Effects of Fullerene for Complex and Metal Hydrides**
M.S. WELLONS, J. TEPROVICH, R. ZIDAN, Savannah River National Laboratory, Aiken, SC, USA

FB-2.5:IL04 **High Pressure Hydrogen Storage in Zeolite Templated Carbon**
S. ITTISANRONNNACHAI, LI-XIANG LI, H. NISHIHARA, **T. KYOTANI**, Inst. for Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; M. ITO, Nissan Research Center, Nissan Motor Co. Ltd., Japan

FB-2.5:IL05 **Metal Loaded Carbons**
T. STERIOTIS, Institute of Physical Chemistry, NCSR "Demokritos", Athens, Greece

FB-2.6 Other High Surface Area Adsorbents

FB-2.6:IL01 **Metal-Organic Frameworks for Hydrogen Adsorption**
HONG-CAI ZHOU, Dept. of Chemistry, Texas A&M University, College Station, TX, USA

FB-2.6:IL02 **Investigating Hydrogen Storage Materials by In Situ Neutron Diffraction**
G.S. WALKER, Fuels and Power Technology Research Division, University of Nottingham, Nottingham, UK

FB-2.6:IL03 **Simple and Binary Hydrogen Clathrate Hydrates: Synthesis and Microscopic Characterization Through Neutron and Raman Scattering**
M. CELLI, D. COLOGNESI, A. GIANNASI, L. ULIVI, M. ZOPPI, Istituto dei Sistemi Complessi - CNR, Sesto Fiorentino (FI), Italy

FB-2.6:IL04 **Hydrogen Storage in Metal-organic Frameworks**
M. HIRSCHER, B. PANELLA, B. SCHMITZ, I. KRKLJUS, Max Planck Institute for Metals Research, Stuttgart, Germany

FB-2.6:IL05 **Spillover Mechanism in Hydrogen Storage Materials**
A. STUBOS, Institute of Nuclear Technology & Radiation Protection, NCSR "Demokritos", Athens, Greece

FB-2.6:L06 **Effect of the Pore Structure Upon Coordinatively Unsaturated Cu Centres**
I. TELEPENI, G. WALKER, Division of Fuels and Power Technology, University of Nottingham, Nottingham, UK; X. LIN, Y. YAN, M. SCHRODER, School of Chemistry, University of Nottingham, UK

FB-2.7 Theoretical Modeling

FB-2.7:IL01 **First-Principles Studies of Phase Stability and Reaction Dynamics in Complex Metal Hydrides**
MEI-YIN CHOU, School of Physics, Georgia Institute of Technology, Atlanta, GA, USA

FB-2.7:IL02 **Computational Screening and Structural Design of Complex Hydrogen Storage Materials**
T. VEGGE[1], J.S. HUMMELSHØJ[1, 2], J.B. MARONSSON[1], J.STEINAR G. MYRDAL[1, 2], [1]Risø National Lab. for Sustainable Energy, Technical University of Denmark, Roskilde, Denmark; [2]Center for Atomic-scale Design and Dept. of Physics, Technical University of Denmark, Lyngby, Denmark

FB-2.7:IL03 **Numerical Simulation of Hydrogen Dynamics at a Mg-MgH2 Interface**
S. GIUSEPPONI, **M. CELINO**, ENEA, C.R. Casaccia, Rome, Italy

FB-2.7:IL04 **Nano-materials for Hydrogen Storage**
P. JENA, Virginia Commonwealth University, Richmond, VA, USA

FB-2.7:L05 **Thermodynamic Database for Hydrogen Storage Materials**
M. BARICCO, M. PALUMBO, E. PINATEL, M. CORNO, P. UGLIENGO, Dipartimento di Chimica IFM and NIS, Università di Torino, Torino, Italy

FB-2.7:L06 **Hydrogen Storage Using Group-IV Nanomaterials**
L.C. LEW YAN VOON, E. SANDBERG, Dept. of Physics, Wright State University, Dayton, OH, USA

FB-2.8 Storage Testing, Safety and Economic Issues

FB-2.8:IL01 **Environmental Reactivity of Solid State Hydride Materials: Modeling and Testing for Air and Water Exposure**
D.L. ANTON, D.A. TAMBURELLO, J.R. GRAY, K.S. BRINKMAN, C.W. JAMES, J.A. CORTES, Savannah River National Laboratory, Aiken, SC, USA

FB-2.8:IL02 **A New Technology for Hydrogen Storage: Theory and Applications for the Transportation and Gas Industries**
D. ELIEZER, FASM C.En Ltd, Zurich, Switzerland

FB-2.8:IL03 **Hydrogen Storage in Complex Hydride Tanks: Upscaling and Testing**
J.M. BELLOSTA VON COLBE, G. LOZANO, J. JEPSEN, M. DORNHEIM, GKSS Research Center Geesthacht GmbH, Geesthacht, Germany

Poster Presentations

FB:P01 **Preparation of Metal Ion Doped Titanate Nanotube Thin Film for Hydrogen Production**
H.J. OH[1], N.H. LEE[1], X. MA[1], J.S. HWANG[2], W.J. LEE[3], S.J. KIM[1], [1]Faculty of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, Korea; [2]Dept. of Electrical Engineering, Jeonnam Provincial College, Jeonnam, Korea; [3]Korea Electrotechnology Research Institute, Changwon, Gyeongnam, Korea

FB:P02 **Photo-electrochemical Characterization of a Miniature PEC Cell with Non-immersion Type TiO2 Photoanodes**
EUI-CHOL SHIN, YONG KIM, HYUN-HO SEO, JONG-SOOK LEE, JONG-HO KIM, DONG-RYUN CHO, Chonnam National University, Gwangju, Korea; EUN-YOUNG JUN, KYUNG-SIK OH, TAE-JOO CHUNG, Andong National University, Andong, Korea; M. LERCH, Technical University of Berlin, Berlin, Germany

FB:P04 **The Influence of Induced Near Surface Defects on Desorption Properties of MgH2**
J.D. GRBOVIC NOVAKOVIC, LJ.LJ. MATOVIC, S.V. KURKO, N.B. NOVAKOVIC, I.N. RADISAVLJEVIC, N.B. IVANOVIC, Vinca Institute of Nuclear Sciences, Belgrade, Serbia

FB:P05 **The Rate Determinig Steps of Catalyzed Mg on Hydrogen Absorption and Desorption Reactions**
T. KIMURA[1], M. TSUBOTA[2], S. ISOBE[2], S. HINO[2], T. ICHIKAWA[1, 2], Y. KOJIMA[1, 2], [1]Graduate School of Advanced Sciences of Matter, Hiroshima University, Higashi-Hiroshima, Japan; [2]Institute for Advanced Materials Research, Hiroshima University, Higashi-Hiroshima, Japan

FB:P06 **Characterization of Mg - x wt. % FeTi Composites Prepared by High Energy Ball Milling**
C. LAL, R. DHUNNA, A. JAIN, D. VYAS, I.P. Jain Centre for Non-Conventional Energy Resources, University of Rajasthan, Jaipur, India

FB:P07 **Metal Hydride-based Composite Materials with Improved Thermal Conductivity and Dimensional Stability Properties**
M. PENTIMALLI, F. PADELLA, ENEA, Casaccia Research Centre, Santa Maria di Galeria, Rome, Italy; E. IMPERI, Labor s.r.l., Rome, Italy; A. FRENI, CNR, ITAE, Messina, Italy

FB:P08 **Effects of Ti-based Additives on Hydrogen Storage Properties in a LiBH4 / CaH2 Destabilized System**
H. YANG, A. IBIKUNLE, A. GOUDY, Dept. of Chemistry, Delaware State University, Dover, DE, USA

FB:P09 **Solid State NMR Investigation of LiAl(NH2)4 on Thermal Decomposition**
T. ONO, **K. SHIMODA**, M. TSUBOTA, T. ICHIKAWA, Y. KOJIMA, Institute for Advanced Materials Research, Hiroshima University, Higashi-Hiroshima, Japan

FB:P10 **Improvement of Decomposition Properties of LiBH4 Dispersed on Multi-walled Carbon Nanotubes**
F. AGRESTI, A. KHANDELWAL, G. CAPURSO, A. MADDALENA, G. PRINCIPI, Università di Padova, Dipartimento di Ingegneria Meccanica, Settore Materiali, Padova, Italy; S. LO RUSSO, Università di Padova, Dipartimento di Fisica and CNISM, Padova, Italy

FB:P11 **Preparation of Modified Carbon Nanostructures for Hydrogen Sorption Studies**
D. MIRABILE GATTIA, M. VITTORI ANTISARI, R. MARAZZI, A. MONTONE, E. PISCOPIELLO, C. MINGAZZINI, ENEA, C.R. Casaccia, Rome, Italy

FB:P12 **Hydrogen Storage on Beryllium-Coated Toroidal Carbon Nanostructure C_{120} modeled with Density Functional Theory**
F. DE L. CASTILLO-ALVARADO[1], J. ORTÍZ-LÓPEZ[1], J.S. ARELLANO[2], A. CRUZ-TORRES[1], [1]Escuela Superior de Física y Matemáticas, Instituto Politécnico Nacional, D.F., México; [2]Universidad Autónoma Metropolitana Azcapotzalco, Dpto de Ciencias Básicas, D.F., México

FB:P13 **Hydrocarbon Gas Storage on Activated Carbon for Vehicule Uses**
S. BEN YAHIA, A. OUEDERNI, Unité de Recherche: Réacteurs Chimiques et Commande des Procédés, Ecole Nationale d'Ingénieurs de Gabès, Université de Gabès, Gabès, Tunisie

FB:P14 **High-Surface Area Carbon-Metal Oxide Composite Materials from Polymeric Precursors**
A.C.V. DE ARAÚJO, E.H.L. FALCAO, S. ALVES JR., W.M. AZEVEDO, Laboratório de Química do Estado Sólido, Dpto de Química Fundamental, Universidade Federal de Pernambuco UFPE, Recife, PE, Brazil

FB:P15 **Possible Paths Toward MgH2 Formation: Theoretical Study**
N.B. NOVAKOVIC, I.N. RADISAVLJEVIC, N.B. IVANOVIC, LJ.LJ. MATOVIC, S.V. KURKO, J.D. GRBOVIC NOVAKOVIC, Vinca Insitute of Nuclear Sciences, Belgrade, Serbia

FB:P16 **Transport Processes Study in Sodium Alanate Hydrogen Storage System During Desorption**
M. BHOURI, J. GOYETTE, Institut de Rechercher sur l'Hydrogene, Univ. du Quebec à Trois-Rivieres, Canada; B.J. HARDY, Savannah River National Laboratory, USA

FB:P17 **Innovative Systems for Hydrogen Storage**
C. GUARDAMAGNA, A. CAVALLARI, ERSE S.p.A., Milano, Italy; S. LO RUSSO, F. AGRESTI, Università di Padova, Padova, Italy; D. ANDREASI, SGS Future, Cavalese (TN), Italy; L. MAGISTRI, M. MONTEVERDE, Università di Genova, Genova, Italy; V. MALVALDI, S. SORICETTI, ENEL Ingegneria ed Innovazione S.p.A., Pisa, Italy; A. PONTAROLLO, B. MOLINAS, Venezia Tecnologie S.p.A., Venezia, Italy

SYMPOSIUM FC

FUEL CELLS: MATERIALS AND TECHNOLOGY CHALLENGES

Oral Presentations

Session FC-1
Solid Oxide Fuel Cells (SOFCs)

FC-1:IL01 **Progress Towards Redox-stable Anode-supported Solid Oxide Fuel Cells**
F. TIETZ, Forschungszentrum Jülich GmbH, IEF-1, Jülich, Germany; QIANLI MA, A. LEONIDE, E. IVERS-TIFFÉE, Karlsruhe Institute of Technology, IWE, Karlsruhe, Germany

FC-1:IL02 **Principle of Mixed Reactant Fuel Cells and Ways to Achieve the Required Catalytic Selectivity**
I. RIESS, Physics Department, Technion-IIT, Haifa, Israel

FC-1:IL03 **Direct-fueled Solid Oxide Fuel Cells Using a Multi-layered Anode with Different Porosities**
CHUNG MIN AN[1], INYONG KANG[2], **N. SAMMES**[1], [1]Dept. of Metallurgical and Materials Eng., Colorado School of Mines, Golden, CO, USA; [2]Dept. of Chemical Eng., Colorado School of Mines, Golden, CO, USA

FC-1:IL04 **Status of SOFC Cell Materials - Possibilities for Significant Improvements During the EU 7th Framework Programme**
R. STEINBERGER-WILCKENS, Forschungszentrum Jülich GmbH, Jülich, Germany

FC-1:IL05 **Metal Supported SOFC Cells, Progress and Benefits**
N. CHRISTIANSEN, Topsoe Fuel Cell A/S, Lyngby, Denmanrk

FC-1:IL06 **Chromium Deposition and Poisoning at Solid Oxide Fuel Cell Cathodes - How Much do we Know?**
SAN PING JIANG, XINGBIN CHEN, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

FC-1:IL07 **Low-temperature SOFC Development**
B. RIETVELD, F. VAN BERKEL, YE ZHANG-STEENWINKEL, ECN, Petten, The Netherlands; E. BOUYER, CEA, France; J. IRVINE, University St. Andrews, UK; M. MENON, Risoe-DTU, Denmark; L. NIEWOLAK, S. GROSS, FZJ, Germany; A. HEEL, P. HOLTAPPELS, EMPA, Switzerland; S. MODENA, HTceramix, Switzerland

FC-1:IL08 **Electrochemical Processes Around three Phase Boundary Area in SOFC Electrodes**
K. EGUCHI, Kyoto University, Kyoto, Japan

FC-1:L09 **Electrochemical Characteristics of Thin Film Electrodes of SOFC Grown by PLD**
M. OTANI, S. TSUKUI, Y. UMEZAKI, T. MUKAI, Dept. of Chemical Engineering, Osaka Prefecture University, Osaka, Japan; K. YOSHIDA, Division of General Education, Tokyo Metropolitan College of Industrial Technology, Tokyo, Japan

FC-1:L10 **Long-Term Study of MIEC Cathodes for intermediate temperature Solid Oxide Fuel Cells**
C. ENDLER, A. LEONIDE, A. WEBER, E. IVERS-TIFFÉE, Inst. für Werkstoffe der Elektrotechnik, Karlsruher Institut für Technologie (KIT), Karlsruhe, Germany; F. TIETZ, Inst. of Energy Research (IEF-1), Forschungszentrum Jülich, Germany

FC-1:L11 **High Performance and Long-term Stability of Ni/GDC Based SOFC Unit Cells Operated at Low Temperature Using CH4 Fuel**
JONG-JIN LEE, HYUN JONG CHOI, HYUN JUN KO, JAE-HA MYUNG, SANG-HOON HYUN, School of Advanced Materials Science & Engineering, Yonsei University, Seoul, Korea

FC-1:IL12 **Materials Challenges for Intermediate and Elevated Temperature Fuel Cells**
L.C. DE JONGHE, Dept. of Materials Science and Engineering, University of California at Berkeley and Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

FC-1:IL13 **Feasibility of Liquid Fuels for SOFC with Ni-base Anode**
H. KISHIMOTO, K. YAMAJI, M.E. BRITO, T. HORITA, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; H. YOKOKAWA, AIST and Tokyo City University, Tokyo, Japan

FC-1:L14 **Fast Parallel Modeling of Fuel Cell Stacks**
A.A. KULIKOVSKY, Institute for Energy Research - Fuel Cells (IEF-3), Research Centre Jülich, Jülich, Germany

FC-1:L15 **Electrical and Dielectric Properties of Yb2O3-ZrO2 Solid Solutions**
F. KUNDRACIK, Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava, Slovakia; M. HARTMANOVÁ, M. JERGEL, Institute of Physics, Slovak Academy of Sciences, Bratislava, Slovakia; J.P. HOLGADO, Institute of Materials Science (Univ. Sevilla - C.S.I.C.), Sevilla, Spain; E.E. LOMONOVA, General Physics Institute, RAS, Moscow, Russia

FC-1:L17 **(Y0.08Sr0.92)(Ti1-xFex)O3-d Perovskite for Solid Oxide Fuel Cell Anode**
JONG SEOL YOON, MI YOUNG YOON, HAE JIN HWANG, Division of Materials Science and Engineering, Inha University, Korea; CHAN KWAK, HEE JUNG PARK, SANG MOK LEE, Samsung Electronics Co., LTD, Korea

FC-1:L18 **The Study of Oxidation Resistance of Fe-Cr-Mn-X Alloys for Interconnector of Solid Oxide Electrolyte Fuel Cell (SOFC)**
W.S. WANG, **S.S. LIAN**, C.CHEN, Dept. of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan; K.C. TSAI, W.J. SHONG, R.Y LEE, Institute of Nuclear Energy Research, the Atomic Energy Council, Taiwan

FC-1:L20 **Structure and Ionic Conductivity of Apatite Type-lanthanum Silicates**
S. GUILLOT, **S. BEAUDET-SAVIGNAT**, S. LAMBERT, CEA/Le Ripault/SRCC/LCCA, Monts, France; P. ROUSSEL, R.-N. VANNIER, UCCS, UMR CNRS 8181, Villeneuve d'Ascq, France

Session FC-2
Polymer Electrolyte Fuel Cells

FC-2:IL01 **High Temperature Polymer Electrolyte Fuel Cells: Prospects and Challenges**
G. BANDLAMUDI, P. BECKHAUS, J. BURFEIND, A. HEINZEL, Centre for Fuel Cell Technology, Germany University of Duisburg-Essen, Germany

FC-2:IL02 **Status on New Materials Development for the ORR for PEM Fuel Cell Applications**
O. SAVADOGO, Laboratory of New Materials for Electrochemistry and Energy, École Polytechnique de Montréal, Montréal, Québec, Canada

FC-2:IL03 **Hierarchically-structured Electrocatalyst and Catalysts Supports for Fuel Cells**
P. ATANASSOV, Center for Emerging Energy Technologies, University of New Mexico, Albuquerque, NM, USA

FC-2:L04 **Mesoporous Tungsten Oxide with Mixed Electron and Proton Conductivity**
G. ORSINI, V. TRICOLI, Università di Pisa, Dipartimento di Ingegneria Chimica e Scienza dei Materiali, Pisa, Italy

FC-2:IL05 **PEM Fuel Cells: Progresses and Challenges**
XIANGUO LI, Dept. of Mechanical and Mechatronics Engineering, University of Waterloo, Waterloo, ON, Canada

FC-2:IL06 **Low Humidity Proton-conducting Membranes**
J. KERR, Lawrence Berkeley National Lab., Berkeley, CA, USA

FC-2:IL07 **Synthesis of Novel Metallodendrimers and Their Applications**
K. YAMAMOTO, Dept. of Chemistry, Keio University, Yokohama, Japan

FC-2:IL08 **Novel Pd-Pt Bimetallic Catalysis for Fuel Cell Applications**
YOUNAN XIA, Dept. of Biomedical Engineering, Washington University, St. Louis, MO, USA

FC-2:L09 **Impact of Carbonaceous Cathode Catalyst Support Type on its Degradation in Proton Exchange Membrane Fuel Cells (PEMFC)**
M. OUATTARA-BRIGAUDET, S. BERTHON-FABRY, C. BEAUGER, P. ACHARD, MINES Paristech, CEP, Sophia-Antipolis, France

FC-2:L10 **Pt/TiO2/C Nanocomposites for the Oxygen Reduction Reaction in PEMFC**
B. RUIZ CAMACHO, R.G. GONZÁLEZ- HUERTA, M.A. VALENZUELA, Laboratorio de Catálisis y Materiales, ESIQIE-Instituto Politécnico Nacional, México D.F.; F. POLA, M. MIKI-YOSHIDA, Centro de Investigación en Materiales Avanzados, Chihuahua, Chih., México

FC-2:L11 **Hybrid Materials for Proton Exchange Membrane Fuel Cell**
K. VALLÉ, F. RAMBAUD, F. PEREIRA, P. BELLEVILLE, CEA, DAM, Monts, France; C. LABERTY, C. SANCHEZ, Univ Paris 06, Coll France, UPMC, UMR CNRS 7574, Paris, France

FC-2:L12 **Pt-TiO2/C as a Durable Cathode-catalyst for PEFCs**
S. VINOD SELVAGANESH, G. SELVARANI, **P. SRIDHAR**, S. PITCHUMANI, CSIR-Central Electrochemical Research Institute-Madras Unit, Chennai, India; A.K. SHUKLA, Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore, India

Session FC-3
Solid-Polymer-Electrolyte Direct Methanol Fuel Cells (SPE-DMFCs)

FC-3:IL01 **Membraneless Fuel Cells as Microscale Power Sources and Analytical Platforms**
P.J.A. KENIS, Dept. of Chemical & Biomolecular Engineering, University of Illinois, Urbana, IL, USA

FC-3:IL02 **Combinatorial Identification of PEM Fuel Cell Electrocatalysts**
R.B. VAN DOVER (Dept. of Materials Science and Engineering); H.C. ABRUNA, F.J. DISALVO (Dept. of Chemistry); J.M. GREGOIRE (Dept. of Physics), Cornell University, Ithaca, New York, USA

FC-3:L03 **Investigation of a Passive DMFC Mini-stack at Ambient Temperature**
A.S. ARICO', V. BAGLIO, A STASSI, V. ANTONUCCI, CNR-ITAE, Messina, Italy

FC-3:L04 **Novel PVA-SSA-HPA-Bridged-Mixed-Matrix-Membrane Electrolytes for DMFCs**
S.D. BHAT[1], A.K. SAHU[1], A. JALAJAKSHI[1], S. PITCHUMANI[1], P. SRIDHAR[1]; A.K. SHUKLA[2], [1]CSIR-Central Electrochemical Research Institute-Madras Unit, Chennai, India; [2]Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore, India

FC-3:L05 **Pt alloys on Carbon Nanostructures as Electrocatalysts for Direct Methanol Fuel Cell**
L. GIORGI, **R. GIORGI**, S. GAGLIARDI, E. SALERNITANO, TH. DIKONIMOS, N. LISI, E. SERRA, ENEA Casaccia Research Center, Rome Italy; M. ALVISI, ENEA Brindisi Research Center, Brindisi, Italy

FC-3:IL06 **Tomographic Diagnostics of Electric Current Fluctuations in Fuel Cells**
H. LUSTFELD, J. HIRSCHFELD, IFF-1, Forschungszentrum Jülich; M. REIßEL, Fachhochschule Aachen, Abteilung Jülich; B. STEFFEN, JSC, Forschungs-zentrum Jülich, Jülich, Germany

FC-3:IL07 **Advanced Electrocatalysts for Direct Methanol Fuel Cells**
A.K. SHUKLA, Solid State & Structural Chemistry Unit, Indian Institute of Science, Bangalore, India; P. SRIDHAR, S. PITCHUMANI, CECRI-Madras Unit, CSIR Complex, Chennai, India

FC-3:IL08 **Small Direct Methanol Fuel Cells with Passive Supply of Reactants**
T.S. ZHAO, Dept. of Mechanical Engineering The Hong Kong University of Science and Technology, Kowloon, Hong Kong SAR, China

Session FC-4
Molten Carbonate and Alkaline Fuel Cells

FC-4:IL01 **Status and Challenges of Molten Carbonate Fuel Cells**
S.J. McPHAIL, ENEA, Rome, Italy

FC-4:IL02 **Critical Issues on MCFC Materials**
M. CASSIR, Lab. d'Electrochimie, Chimie des Interfaces et Modélisation pour l'Energie, LECIME, UMR 7575 CNRS, Chimie ParisTech, Paris, France

FC-4:IL03 **Solutions for Material Corrosion Problems in MCFC**
S. FRANGINI, A. MORENO, ENEA CRE Casaccia, Dept. TER, S. Maria di Galeria, Rome, Italy

FC-4:L04 **Unraveling Oxygen Reduction Reaction Mechanisms on Carbon Supported Fe-Phthalocyanine and Co-Phthalocyanine Catalysts in Alkaline Media**
RONGRONG CHEN[1], HAIXIA LI[1], ANDREW HSU[1], DERYN CHU[2], GUOFENG WANG[1], [1]Richard G. Lugar Center for Renewable Energy, Indiana University Purdue University-Indianapolis, IN, USA; [2]U.S. Army Research Laboratory, Adelphi, MD, USA

Session FC-5
State-of-the-art Application Engineering and Demonstrations

FC-5:IL01 **Towards Industrial Production of SOFC Stacks**
M.J. JOERGENSEN, S. PRIMDAHL, Topsoe Fuel Cell A/S, Lyngby, Denmark

FC-5:L02 **Demonstration of Polymeric Electrolyte Fuel Cell Systems for Future Power Distribution Grids**
F. SERGI, G. BRUNACCINI, G. DISPENZA, N. BRIGUGLIO, M. FERRARO, V. ANTONUCCI; Consiglio Nazionale delle Ricerche Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano" CNR-ITAE, Messina, Italy

FC-5:L03 **Diagnostics and Effective Stabilization of Currents in a Fuel Cell Stack**
J. HIRSCHFELD, Forschungszentrum Jülich, IAS-1; H. LUSTFELD, Forschungszentrum Jülich, IFF-1; M. REIßEL, Fachhochschule Aachen; B. STEFFEN, Forschungszentrum Jülich, JSC, Jülich, Germany

FC-5:L04 **Solide Oxide Fuel Cell System for Distributed Generation**
G. BRUNACCINI, G. DISPENZA, F. SERGI, M. FERRARO, A.S. ARICO', V. ANTONUCCI; Consiglio Nazionale delle Ricerche Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano" CNR-ITAE, Messina, Italy

Poster Presentations

FC:P01 **Preparation and Characterization of Zirconia-India Ceramics**
D. ZANETTI DE FLORIO, M.M.C. EDDINE, J.F.Q. REY, UFABC, Santo André, SP, Brazil; F.C. FONSECA, IPEN, São Paulo, SP, Brazil

FC:P02 **Synthesis and Characterization of LaxSr1-xFeO3 Obtained by the Sol-gel as a Cathode of IT-SOFC**
I. CASTRO-CISNEROS, P. RAMOS-ALVAREZ, C. FLORES-MORALES, J.A. CHAVEZ-CARVAYAR, Inst. de Investigaciones en Material., UNAM, D.F., Mexico

FC:P03 **Synthesis and Structural Properties of Nano-crystalline Ce1-xRxO2-d (R=Sm,Ga) Electrolyte Synthetized by the Pechini Method**
P. RAMOS-ALVAREZ, I. CASTRO-CISNEROS, C. FLORES-MORALES, J.A. CHÁVEZ-CARVAYAR, Inst. de Investigaciones en Materiales, UNAM, D.F., Mexico

FC:P04 **Synthesis and Characterization of LSCF/CGO Composite Used as SOFC Cathode Material**
JAE LAYNG PARK, TAK-HYOUNG LIM, SEUNG-BOK LEE, SEOK-JOO PARK, **RAK-HYUN SONG**, DONG-RYUL SHIN, Fuel Cell Research Center, Korea Institute of Energy Research, Daejeon, Korea

FC:P05 **Fabrication of 1.3kW Class Anode-supported Flat Tubular SOFC Stack**
TAK-HYOUNG LIM, JAE-LAYNG PARK, SEOK-JOO PARK, SEUNG-BOK LEE, RAK-HYUN SONG, DONG-RYUL SHIN, Fuel Cell Research Center, Korea Institute of Energy Research, Daejeon, Korea

FC:P06 **Exploitation of the Conductivity Anistropy in Polycrystalline Apatite-type Solid Electrolytes Lanthanum Silicates**
YONG KIM, EUI-CHOL SHIN, JIN-SUP IM, JAEKOOK KIM, JONG-SOOK LEE, Chonnam National University, Gwangju, Korea; DONG-IK KIM, Korea Institute of Science and Technology, Seoul, Korea

FC:P07 **Degradation of Promising LSCF and LSF-based Cathodes for Anode-supported Cells**
A. ARREGUI[1, 3], L.M. RODRIGUEZ-MARTINEZ[3], S. MODENA[2], M. BERTOLDI[2], J. VAN HERLE[4], V.M. SGLAVO[1], [1]DIMTI, University of Trento, Trento, Italy; [2]SOFCPOWER S.r.l., Pergine Vals (TN), Italy; [3]IKERLAN S.Coop, Mondragón, Spain; [4]Swiss Federal Institute of Technology Lausanne, EPFL, STI-ISE-LENI, Lausanne, Switzerland

FC:P08 **SrCo0.8Fe0.2O3-delta and Ba0.5Sr0.5Co0.8Fe0.2O3-delta Cathodes for LSGM Based SOFCs**
Y. EKINCI, N. SOLAK, Istanbul Technical University, Turkey; O. KARAKOC, R. DEMIRYUREK, C. ONCEL, M.A. GULGUN, Sabanci University, Turkey

FC:P09 **Synthesis of Nanosized Perovskite-structure La0.75Sr0.25Cr0.5Mn0.5O3-d (LSCM) Powders as an Electrode Material for IT-SOFC**
V.S. REDDY CHANNU, E.H. WALKER Jr., S.A. WICKER Sr, Dept. of Chemistry, Southern University and A&M College, Baton Rouge, LA, USA; Q.L. WILLIAMS, R.R. KALLURU, Dept. of Physics, Atmospheric Sciences and Geoscience, Jackson State University, Jackson, MS, USA

FC:P10 **High Temperature-FTIR Characterization of Gadolinia Doped Ceria**
A. ARABACI, Istanbul University, Dept. of Metallurgical and Materials Engineering, Avcilar, Istanbul, Turkey; N. SOLAK, Istanbul Technical University, Dept. of Metallurgical and Materials Engineering, Istanbul, Turkey

FC:P11 **Electrically Conductive CNT/PTFE Composite Film for Corrosion Resistant Coating on Bipolar Plate of Polymer Exchange Membrane Fuel Cells**
Y. SHOW, Tokai University, Hiratsuka, Kanagawa, Japan

FC:P12 **Low Pt Content Catalyst for PEM Fuel Cells Based on Water Insoluble Salts of Heteropolyacids**
S. DSOKE, P. MERINO, R. MARASSI, Dept. of Chemistry, University of Camerino, Camerino (MC), Italy; B. SCROSATI, Dept. of Chemistry, University of Rome "La Sapienza", Rome, Italy; P.J. KULESZA, A. KOLARY, A. ZUROWSKI, Dept. of Chemistry, University of Warsaw, Warsaw, Poland

FC:P13 **Sulfonation of Polyaniline to be Used in Proton Exchange Membrane Fuel Cells**
A.P. SANTIAGO DE FALCO, M.S. PINHO, Brazilian Navy Research Institute (IPqM), Ilha do Governador, Rio de Janeiro, RJ, Brazil; L.C. MENDES, Macromolecules Institute Prof. Eloisa Mano, Federal University of Rio de Janeiro (IMA/UFRJ), RJ, Brazil

FC:P14 **Facile Preparation of Carbon Supported Co-Pd Alloy and Core-Shell Nanoparticles by Ultrasound and Their Enhanced Electrocatalytic ORR Activity**
JI-HOON JANG, YOUNG-UK KWON, Dept. of Chemistry, BK-21 School of Chemical Materials Science, Sungkyunkwan University, Suwon, Rep. of Korea

FC:P15 **Electrochemical Degradation of Gas Diffusion Layers in PEM Fuel Cells**
M.J. RENNESON, J. PROOST, Université Catholique de Louvain, Division of Materials and Process Engineering, Louvain-la-Neuve, Belgium; W. FREDRIKSSON, M. ODGAARD, K. EDSTRÖM, Uppsala University, Dept. of Materials Chemistry, Uppsala, Sweden

FC:P16 **Synthesis of Pt-Mo-N Films and Their Catalytic Activity**
A. MIURA, J.M. GREGOIRE, M.E. TAGUE, R. BRUCE VAN DOVER, H.D. ABRUNA, F.J. DiSALVO, Cornell University, Ithaca, NY, USA

FC:P17 **Computational Phase Studies in the (La,Sr)(Ga,Mg)O3-d System for IT-SOFC Systems**
N. SOLAK, Istanbul Technical University, Dept. of Metallurgical & Materials Eng., Maslak, Istanbul, Turkey

FC:P18 **3D Reconstruction and Modelling of Porous Electrodes for Solid Oxide Fuel Cells (SOFC)**
J. JOOS, B. RÜGER, A. WEBER, E. IVERS-TIFFÉE, Institut für Werkstoffe der Elektrotechnik, Karlsruher Institut für Technologie (KIT), Karlsruhe, Germany; T. CARRARO, Institute of Applied Mathematics, University of Heidelberg, Heidelberg, Germany

SYMPOSIUM FD

ELECTROCHEMICAL ENERGY STORAGE SYSTEMS: THE NEXT EVOLUTION

Oral Presentations

Session FD-1
Chemical Storage

FD-1:IL01 **Advances in Lithium Lithium-Air and Lithium-Water Batteries**
S.J. VISCO, E. NIMON, L. DE JONGHE, PolyPlus Battery Company, Berkeley, CA, USA

FD-1:IL02 **Spinel Cathodes for Li-ion Cells**
JAEPHIL CHO, Ulsan National Inst. of Science & Technology, Ulsan, Korea

FD-1:IL03 **Materials for Lithium Batteries**
P.G. BRUCE, University of St Andrews, St Andrews, Scotland

FD-1:IL04 **Interfacial Phenomena in Solid-State Lithium Batteries with Sulfide Solid Electrolytes**
K. TAKADA, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

FD-1:IL05 **Multinuclear Solid State NMR Studies of Li Battery Electrode Materials**
S.G. GREENBAUM, Dept. of Physics & Astronomy, Hunter College of CUNY and CUNY Graduate Center, New York, NY, USA

FD-1:IL06 **Printable Batteries for Smart Objects**
R.R. BAUMANN, Chemnitz University of Technology, Institute for Print and Media Technology, Chemnitz, Germany

FD-1:IL07 **An Approach to 12 V Lead-free Batteries Consisting of Lithium Insertion Materials for Automobile and Stationary Applications**
T. OHZUKU, Graduate School of Engineering, Osaka City University (OCU), Osaka, Japan

FD-1:IL08 **Lithium Nitrides as New Anode Materials for Lithium-ion Batteries**
D.H. GREGORY, WestCHEM, Dept. of Chemistry, University of Glasgow, Glasgow, UK

FD-1:L09 **A Safe, High-rate and High-energy Polymer Lithium-ion Battery Based on Gelled Membrane Prepared by Electrospinning**
F. CROCE[1], M.L. FOCARETE[2], J. HASSOUN[3], I. MESCHINI[1], B. SCROSATI[3], [1]Dip. di Scienze del Farmaco, Università "G.D'annunzio", Chieti, Italy; [2]Dip. di Chimica "G. Ciamician", Università di Bologna, Bologna, Italy; [3]Dip. di Chimica, Università "La Sapienza", Rome, Italy

FD-1:L10 **Study of Carbon Nanotubes for Lithium-ion Batteries Applications**
A. VARZI, C. TÄUBERT, M. WOHLFAHRT-MEHRENS, ZSW-Center for Solar Energy and Hydrogen Research, Ulm, Germany; M. KREIS, W. SCHÜTZ, FutureCarbon GmbH, Bayreuth, Germany

FD-1:IL11 **On the Road Towards 3D-integrated All-solid-state Batteries**
P.H.L. NOTTEN, Eindhoven University of Technology and Philips Research Laboratories, Eindhoven, The Netherlands

FD-1:IL12 **Materials for Aqueous Rocking-chair Batteries**
Q.T. QU[1], Y. SHI[1], S. TIAN[1], **YUPING WU**[1], R. HOLZE[2], [1]NEML, Dept. of Chemistry and Shanghai Key Lab. of Molecular Catalysis & Innovative Materials, Fudan University, Shanghai, China; [2]Technische Universität Chemnitz, Institut für Chemie, Chemnitz, Germany

FD-1:L13 **Solid State and Aqueous Li-ion Batteries with Polyanionic Electrode Active Materials**
SHIGETO OKADA, SUN IL PARK, EIJI KOBAYASHI, JUN-ICHI YAMAKI, Inst. for Materials Chemistry and Engineering, Kyushu University, Fukuoka, Japan

FD-1:L14 **Activation of Phosphate Olivines LiMPO4 (M = Fe, Mn) by Functionalized Carbon Nanotubes: Application for Cathode Materials of Li-Ion Battery**
L. KAVAN, J. Heyrovský Institute of Physical Chemistry, v.v.i., Academy of Sciences of the Czech Republic, Prague, Czech Republic

FD-1:L15 **Sago Based Gel Polymer Electrolyte for Zinc-Air Battery**
M.N. MASRI, **A.A. MOHAMAD**, School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia, Nibong Tebal, Penang, Malaysia

FD-1:IL16 **Modified Graphite Anodes for Lithium-ion Batteries Optimized for Low Temperature**
R. MARASSI, F. NOBILI, S. DSOKE, M. MANCINI, M. MARINARO, S. GIULI, R. TOSSICI, Dept. of Chemistry, University of Camerino, Camerino (MC), Italy

FD-1:IL17 **Gel-polymer Composite Electrolyte for Perspective Li-metal Secondary Battery Systems**
TETSUYA OSAKA, Waseda University, Tokyo, Japan

FD-1:L18 **Ionic Liquid Electrolyte Mixtures for Low Temperature Applications**
G.B. APPETECCHI, M. MONTANINO, M. CAREWSKA, F. ALESSANDRINI, S. PASSERINI*, ENEA, IDROCOMB, Rome, Italy; *present address: Westfälische Wilhelm Universität, Institut fur Physikalische Chimie, Münster, Germany

FD-1:L19 **New Synthesis Method for Conversion Materials with High Cyclic Stability**
M. FICHTNER, W. LOHSTROH, C. WALL, **R. PRAKASH**, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

Session FD-2
Capacitive Storage

FD-2:IL01 **Emerging New Materials for Electrochemical Capacitors**
S.R.S. PRABAHARAN[1], T. NATHAN[1], M. CLOKE[1], P. SIMON[2], [1]Faculty of Engineering, University of Nottingham Malaysia Campus, Jalan Broga, Semenyih, Malaysia; [2]Institut Universitaire de France, Université Paul Sabatier, Toulouse III, CIRIMAT, UMR 5085, Toulouse, France

FD-2:IL02 **Graphene Supercapacitors**
W. SUGIMOTO, J. SATO, K. FUKUDA, Y. TAKASU, Shinshu University, Ueda, Nagano, Japan

FD-2:L03 **Self-assembled Synthesis of Graphene Nanosheets for Supercapacitors**
YING-FENG LEE, KUO-HSIN CHANG,CHI-CHANG HU, National Tsing-Hua University, Hsin-Chu, Taiwan

FD-2:L04 **Flexible Supercapacitors Consisting of Polyaniline and RuO2/Graphene Nanocomposite**
KUO-HSIN CHANG, Y.F. LEE, C.C. HU, P.J. HUNG, National Tsing Hua University, Hsin-Chu, Taiwan

FD-2:IL05 **3D-integrated All-solid-state Capacitors**
F. ROOZEBOOM, E. LANGEREIS, N. LEICK, M.C.M. VAN DE SANDEN, W.M.M. KESSELS, Eindhoven University of Technology, Eindhoven, The Netherlands; J. KLOOTWIJK, W. DEKKERS, Philips Research, Eindhoven, The Netherlands; E. TOIS, M. TUOMINEN, ASM Microchemistry Ltd, Helsinki, Finland; Y. LAMY, K. JINESH, W. BESLING, A. ROEST, NXP Semiconductors, Eindhoven, The Netherlands; C. BUNEL, IPDIA, Caen, France

FD-2:IL06 **Design of Nanostructured Oxides for Advanced Electrochemical Supercapacitors**
CHI-CHANG HU, KUO-HSIN CHANG, CHAO-MING HUANG, HSIN-YI GUO, JING-MEI LI, Dept. of Chemical Engineering, National Tsing Hua University, Hsin-Chu, Taiwan

FD-2:L07 **Printed Supercapacitor as Hybrid Device with Enzymatic Power Source**
J. KESKINEN, E. SIVONEN, VTT Technical Research Centre of Finland, Tampere, Finland; M. BERGELIN, J.-E. ERIKSSON, P. SJÖBERG-EEROLA, Abo Akademi, PCC/Inorganic Chemistry, Turku, Finland; M. VALKIAINEN, M. SMOLANDER, A. KOIVULA, H. BOER, VTT Technical Research Centre of Finland, VTT, Finland

FD-2:L08 **Electrochemical Deposition of Vanadium Oxides for Supercapacitors: The Key Factor of Determining the V^{5+}/V^{4+} Ratio**
JING-MEI LI, K.H. CHANG, C.C. HU, National Tsing Hua University, Hsin-Chu, Taiwan

FD-2:IL09 **Mesostructured Materials for Electrochemical Capacitors**
B. DUNN, Dept. of Materials Science and Engineering, University of California, Los Angeles, CA, USA

FD-2:IL10 **Electrode Materials for Hybrid Supercapacitors**
D. CERICOLA, **R. KÖTZ**, P. NOVAK, A. WOKAUN, General Energy Research Dept., Paul Scherrer Institut, Villigen PSI, Switzerland

FD-2:IL11 **Tailoring of Mesoporous Carbons for Advanced Electric Double Layer Capacitors**
D. JURCAKOVA, T.E. RUFFORD, Z.H. ZHU, G.Q.M. LU, University of Queensland, ARC Centre of Excellence for Functional Nanomaterials, AIBN and School of Engineering, Brisbane, QLD, Australia

FD-2:IL12 **Recent Advances in Understanding the Capacitive Storage in Microporous Carbons**
P. SIMON, Université de Toulouse, CIRIMAT UMR CNRS 5085, Toulouse, France; Y. GOGOTSI, Drexel University, Dept. of Materials Science and Engineering, Philadelphia, USA

FD-2:IL13 **Nanohybrid Capacitor: A New Hybrid Capacitor System, Triply Enhanced Energy Density by Use of nc-Li4Ti5O12/CNF**
K. NAOI, Institute of Symbiotic Science & Technology, Tokyo University of Agriculture & Technology, Tokyo, Japan

Session FD-3
Application Engineering

FD-3:IL01 **Electrochemical Storage for Multi-source Hybrid Renewable Energy Systems**
V. ANTONUCCI, M. FERRARO, G. NAPOLI, N. BRIGUGLIO, G. BRUNACCINI, F. SERGI, CNR, Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano", Messina, Italy; G. GRADITI, ENEA - Centro Ricerche Portici, Napoli, Italy

FD-3:IL02 **Energy Conservation and Management Strategies for Commercial Li-ion Batteries in Telecommunication Applications**
T. TSUJIKAWA, K. YABUTA, T. MATSUSHITA, NTT Facilities, Inc., Tokyo, Japan; M. ARAKAWA, NTT Facilities Research Institute Inc., Tokyo, Japan; K. HAYASHI, Shin-Kobe Electric Machinery Co., Ltd., Saitama, Japan

FD-3:IL03 **Real-Time Impedance Monitoring of Electrode/Electrolyte Interfaces**
SU-MOON PARK, JUNG-SUK YOO, BYOUNG-YONG CHANG, School of Energy Engineering, Ulsan National Institute of Science and Technology, Ulsan, Korea

Poster Presentations

FD:P01 **Nanostructured Anode and Cathode Materials for Li-ion Batteries**
G. FERRARA, C. ARBIZZANI, L. DAMEN, **R. INGUANTA**, S. PIAZZA, C. SUNSERI, M. MASTRAGOSTINO, Dip. di Ingegneria Chimica dei Processi e dei Materiali, Università di Palermo, Italy; Dip. di Scienza dei Metalli, Elettrochimica e Tecniche Chimiche, Università di Bologna, Bologna, Italy

FD:P02 **Validity of MgFe2O4 Normal Spinel as a Cathode Material for Rechargeable Battery**
S. MARUYAMA, Y. MIYAZAKI, T. KAJITANI, Dept. of Applied Physics, Graduate of Engineering, Tohoku University, Sendai, Japan

FD:P03 **A Molecular Dynamics Study on Pressure Dependence of Ag Diffusion in Ag3SI**
M. YARIMITSU, **M. ANIYA**, Dept. of Physics, Kumamoto University, Kumamoto, Japan

FD:P04 **A Chemical Bonding Approach to Ionic Conduction and Thermal Expansion in Oxide Ion Conductors**
S. TANIGUCHI, M. ANIYA, Dept. of Physics, Kumamoto University, Kumamoto, Japan

FD:P05 **Characterization of Silica-filled Functionalized Epoxidized Natural Rubber Based Polymer Electrolyte Systems by UV Irradiation**
R. IDRIS, A. TASNIM, Z. GHAZALI, K. MOHAMED, M.R. HAKIM, M. HARIS, Advanced Materials Centre, SIRIM BERHAD, Kulim, Kedah Darul Aman, Malaysia

FD:P06 **Synthesis of Vanadium Oxide Nanomaterias Using Polyblend as a Reducing Agent for Electrochemical Applications**
V.S. REDDY CHANNU, Dept. of Chemistry, Southern University and A&M College, Baton Rouge, LA, USA; **RAMBABU BOBBA**, Solid State Ionics Lab., Dept. of Physics, Southern University and A&M College, Baton Rouge, LA, USA; CHEN WEN, Inst. of Materials Science & Engineering, Wuhan University of Technology, Wuhan, China

FD:P07 **Synthesis of Li2Ni8O10 for Lithium Ion Rechargeable Battery Electrodes**
JINGLAN DENG, School of Science, Wuhan University of Technology, Wuhan, P.R. China; V.S. REDDY CHANNU, Dept. of Chemistry, Southern University and A&M College, Baton Rouge, LA, USA; RAMBABU BOBBA, Solid State Ionics Lab., Dept of Physics, Southern University and A&M College, Baton Rouge, LA, USA

FD:P08 **Mesoporous Carbon Nitride - Synthesis and Characterisation**
J. KUMAR[1], R. PRASAD[2], A.M. AWASTHI[1], [1]UGC-DAE Consortium for scientific research, Indore, India; [2]School of Chemistry, DAVV, Indore, India

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

Oral Presentations

Session FE-1
Theoretical Concepts and Basic Approaches

FE-1:IL01 **Thermoionic and Thermoelectric Energy Conversion**
A. SHAKOURI, Baskin School of Engineering, University of California, Santa Cruz, CA, USA

FE-1:IL02 **Band Structure Optimization and Development of Efficient Silicide Thermoelectrics**
M.I. FEDOROV, V.K. ZAITSEV, Ioffe Physical-Technical Institute of the RAS, St. Petersburg, Russia

FE-1:IL03 **Ab Initio Studies of Impurities, Defects and Defect Complexes in PbTe Based Thermoelectric Materials**
S.D. MAHANTI, Dept. of Physics and Astronomy, Michigan State University, East Lansing, MI, USA

FE-1:IL04 **Multi-layered Thermoelectric Power Generator**
R.O. SUZUKI, Dept. of Materials Science, Hokkaido University, Sapporo, Japan

FE-1:IL05 **Nanostructured Thermoelectric Materials and Their Potential Applications**
GANG CHEN, M.S. DRESSELHAUS, Massachusetts Institute of Technology, Cambridge, MA, USA; Z.F. REN, Boston College, Chestnut Hill, MA, USA

FE-1:IL06 **Thermoelectric Energy Conversion Near Carnot Efficiency**
H. LINKE, The Nanometer Structure Consortium and Division of Solid State Physics, Lund University, Lund, Sweden

FE-1:IL07 **Theory of Nanostructured Thermoelectrics**
G.D. MAHAN, Penn State University, University Park, PA, USA

FE-1:IL08 **Large Thermopower Driven by "Pudding-mold"-type Bands**
K. KUROKI, Dept. of Applied Physics and Chemistry, The University of Electro-Communications, Tokyo, Japan

FE-1:IL09 **Zintl Chemistry for Designing High Efficiency Thermoelectric Materials**
G.J. SNYDER, California Institute of Technology, Pasadena, CA, USA

FE-1:IL10 **Strategy for Thermoelectric Application**
R. FUNAHASHI, S. URATA, Y. MATSUMURA, K. IWASAKI, A. KOSUGA, National Institute of Advanced Industrial Science and Technology, Ikeda, Osaka, Japan; T. URATA, CREST, Japan Science and Technology Agency, Chiyoda, Tokyo, Japan

FE-1:L11 **Development of Nanocrystalline Thermoelectric Films of p-type Bi2Te3 Based Compound**
S. JARBY, R. BAR, V. EZERSKY, V. KASIYAN, **Z. DASHEVSKY**, Dept. of Materials Engineering, Ben-Gurion University of the Negev, Beer-Sheva, Israel

FE-1:L12 **Thermoelectric Iron Oxides**
T. KAJITANI, T. NOZAKI, K. HAYASHI, Dept. of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan

FE-1:L13 **Macro to Micro Derivation of the Thermoelectric Thermodynamics**
Y. APERTET[1], **C. GOUPIL**[2], P. LECOEUR[1], [1]Inst. d'Electronique Fondamentale Bat. 220, Université Paris Sud, Orsay, France; [2]CRISMAT CNRT, Caen, France

FE-1:L14 **Theoretical Performance Characteristics of Wearable Thermoelectric Generators**
V. LEONOV, IMEC, Leuven, Belgium

Session FE-2
New and Improved Materials and Low Dimensionality Structures

FE-2:IL01 **Materials and Devices for Thermal-to-Electric Energy Conversion**
K. KOUMOTO, Nagoya University, Graduate School of Engineering, Nagoya, Japan, CREST, Japan Science and Technology Agency, Tokyo, Japan

FE-2:IL02 **Thermoelectric Perspectives of Transition Metal Oxides**
J. HEJTMANEK, Z. JIRAK, K. KNIZEK, Institute of Physics of ASCR, v.v.i, Praha, Czech Republic; P. TOMES, A. WEIDENKAFF, Solid State Chemistry and Catalysis, Empa, Duebendorf, Switzerland; C. MARTIN, CRISMAT, ENSICAEN, CNRS-UMR6508, Caen Cedex, France

FE-2:L03 **Search for n-type Thermoelectric Oxides: the Case of the Hollandite**
A. MAIGNAN, C. MARTIN, S. HÉBERT, E. GUILMEAU, Laboratoire CRISMAT, UMR 6508 CNRS ENSICAEN, Caen, France

FE-2:L04 **Effect of Co-substitution on the Structure and Thermoelectric Properties of Chimney-ladder Solid Solution (Mn1-xCox)Siy (y~1.7)**
Y. MIYAZAKI, Y. SAITO, K. HAYASHI, K. YUBUTA, T. KAJITANI, Dept. of Applied Physics, Tohoku University, Sendai, Japan; Institute for Materials Research, Tohoku University, Katahira, Sendai, Japan

FE-2:IL05 **Recent Advances in High Temperature Thermoelectric Generating Technology**
J.-P. FLEURIAL, T. CAILLAT, E. BRANDON, J. PAK, V. RAVI, P. GOGNA, Jet Propulsion Laboratory/California Institute of Technology, Pasadena, CA, USA

FE-2:IL06 **Clathrates: A Challenge for Thermoelectricity?**
P.F. ROGL, Institute of Physical Chemistry, University of Vienna, Vienna, Austria

FE-2:L07 **Effect of Annealing on High Temperature Thermoelectric Performance of ZrNiSn Half-Heusler Compounds**
PENGFEI QIU, JIONG YANG, XIANGYANG HUANG, LIDONG CHEN, CAS Key Lab. of Materials for Energy Conversion, Shanghai Institute of Ceramics, CAS, Shanghai, P.R. China

FE-2:L08 **Non-contact Optical Method for Measuring Thin Film Lattice Temperatures**
P.J. McCANN, L. OLONA, J.D. JEFFERS, J. GREGO, ZHIHUA CAI, School of Electrical and Computer Eng., Univ. of Oklahoma, Norman, OK, USA; ZHIXI BIAN, Baskin School of Eng., Univ. of California, Santa Cruz, CA, USA

FE-2:IL09 **Thermoelectric Properties of Cobalt Oxides Improved by Spin State Control**
I. TERASAKI, Dept. of Applied Physics, Waseda University, Tokyo, Japan

FE-2:IL10 **Layered Thermoelectric Oxides**
S. HEBERT, D. PELLOQUIN, O. PÉREZ, W. KOBAYASHI, A. MAIGNAN, Laboratoire CRISMAT, Caen, France

FE-2:L11 **Epitaxial Growth of Nanostructured Bismuth Films on Si Through a Chemical Solution Route**
ZHENGLIANG SUN, SHENGCONG LIUFU, QIN YAO, LIDONG CHEN, CAS Key Lab. of Materials for Energy Conversion, Shanghai Institute of Ceramics, CAS, Shanghai, P.R. China

FE-2:L12 **Electrical and Thermal Transport Properties of ZnO Thermoelectric Oxide Doped with Al and Ga**
M. OHTAKI, K. YAMAMOTO, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Fukuoka, Japan

FE-2:IL13 **Synthesis, Structure and Thermoelectric Properties of Complex Rare Earth Antimonides**
A. CHAMOIRE, J.C. TEDENAC, Institut Charles Gerhardt Montpellier, Equipe PMOF, UMR 5253, Univ. Montpellier II, Montpellier, France; C. ESTOURNÈS, CIRIMAT, PNF2 MHT, Univ. Paul Sabatier, Toulouse, France; T. CAILLAT, Jet Propulsion Lab., Caltech, Pasadena, CA, USA; **F. GASCOIN**, ENSICAEN CNRS, UMR 6508, Lab. CRISMAT, Caen, France

FE-2:IL14 **Functions of Key Structural Unit and Performance Optimization in Novel Thermoelectric Compounds**
L.D. CHEN, W. ZHANG, J.H. YANG, X. SHI, X.Y.SHI, J. YANG, X.H. CHEN, X.Y. HUANG, Shanghai Institute of Ceramics, CAS, Shanghai, China

FE-2:L15 **Effect of Strontium and Europium Substitutions on Thermoelectric Properties in Silicon-Based Clathrate Compounds**
H. ANNO*, T. NAKABAYASHI, M. HOKAZONO, Tokyo University of Science, Yamaguchi, Sanyo Onoda, Japan; *JST, CREST, Tokyo, Japan

FE-2:L16 **Thermal Expansion of Clathrate Compounds Ba8Mx{Si,Ge}46-x (M = Cu, Zn, Pd, Ag, Cd, Pt, Au)**
M. FALMBIGL, P.F. ROGL, Institute of Physical Chemistry, University of Vienna, Wien, Austria; M. KRIEGISCH, H. MÜLLER, E. BAUER, S. PASCHEN; Inst. of Solid State Physics, Vienna University of Technology, Wien, Austria

FE-2:IL17 **High Temperature Thermoelectric Properties of a Homologous Series of n-type Boron Icosahedra Compounds: a Possible Counterpart to p-type Boron Carbide**
TAKAO MORI, International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Tsukuba, Japan

FE-2:IL18 **Synthesis, Structural and Chemical Characterizations, and Transport Properties of $Mo_{3-x}Ru_xSb_{7-y}Te_y$**
C. CANDOLFI, B. LENOIR, J. LESZCZYNSKI, P. MASSCHELEIN, C. CHUBILLEAU, A. DAUSCHER, Institut Jean Lamour, CNRS-Nancy Université-UPVM, ENSMN, Nancy, France; E. GUILMEAU, CRISMAT-ENSICAEN, CNRS/UMR 6508, Caen, France; J. HEJTMANEK, Institute of Physics, Academy of Sciences of the Czech Republic, Praha, Czech Republic; J. TOBOLA, Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Krakow, Poland; S.J. CLARKE, Dept. of Chemistry, University of Oxford, Inorganic Chemistry Lab., Oxford, UK; R.I. SMITH, ISIS Facility, Rutherford Appleton Lab., Chilton, Didcot, Oxon, UK

FE-2:L19 **Tuning of Thermoelectric Properties in Double Doped Skutterudites from Electronic Structure Calculations**
J. TOBOLA[1], J. LESZCZYNSKI[2], K. KUTORASINSKI[1], A. DAUSCHER[2], B. LENOIR[2], [1]Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Krakow, Poland; [2]Institut Jean Lamour, UMR CNRS-Nancy Université-UPVM 7198, ENSMN, Nancy, France

FE-2:L20 **Thermoelectric Properties of the Heavy Element Doped Heusler Fe2VAl Alloy Prepared by Powder Metallurgy Technique**
M. MIKAMI, K. KOBAYASHI, National Institute of Advanced Industrial Science and Technology, Nagoya, Japan; S. TANAKA, Dept. of Environmental and Materials Engineering, Nagoya Institute of Technology, Nagoya, Japan

FE-2:IL21 **Misfit Layered Compounds - Nanocomposite Thermoelectric Materials**
D.C. JOHNSON, C. HEIDEMAN, QIYIN LIN, M. SMELLER, Dept. of Chemistry and Materials Science Institute, University of Oregon, Eugene, OR, USA

FE-2:IL22 **Recent Advances in In2O3 Based Thermoelectrics**
E. GUILMEAU, T. ZHOU, S. BHAME, A. MAIGNAN, B. RAVEAU, Laboratoire CRISMAT, UMR 6508 CNRS-ENSICAEN, Caen, France

FE-2:L23 **Thermoelectric Generating Properties of Perovskite Like Materials**
H. KOHRI, Kogakuin University, Hachioji, Tokyo, Japan; M. KATO, I.J. OHSUGI, I. SHIOTA, Salesian Polytechnic, Machida, Tokyo, Japan

FE-2:L24 **Thermoelectric Properties of Spark Plasma Sintered (SPS) Fully Dense Silicon Carbide Nanoensembles**
D.M. GRUEN, P. BRUNO, Materials Science Division, Argonne National Laboratory; J. ROUTBORT, D. SINGH, Energy System Division, Argonne National Laboratory, Argonne, IL, USA

FE-2:L25 **Enhanced Thermoelectric Performance of Carbon Nanotube/Polyaniline Composites**
QIN YAO, LIDONG CHEN, WENQING ZHANG, SHENGCONG LIUFU, XIHONG CHEN, ZHENGLIANG SUN, Shanghai Institute of Ceramics, Chinese Academy of Science, Shanghai, China

FE-2:IL26 **High Figure of Merit Superlattice Thermoelectric Materials and Devices**
R. VENKATASUBRAMANIAN, G. BULMAN, P. BARLETTA, J. STUART, T. COLPITTS, RTI International, Research Triangle Park, NC, USA.

FE-2:IL27 **Rapid Solidification Methods for Fabrication of Novel Thermoelectric Materials**
XINFENG TANG[1], HAN LI[1], WENJIE XIE[1, 3], YONGGAO YAN[1], QINGJIE ZHANG[1], C. UHER[2], T.M. TRITT[3], [1]State Key Lab. of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, P.R. China; [2]Dept. of Physics, University of Michigan, Ann Arbor, MI, USA; [3]Dept. of Physics and Astronomy, Clemson University, Clemson, SC, USA

FE-2:L28 **Thermal Expansion and Mechanical Properties of Skutterudites**
G. ROGL[1, 2, 3, 4], L. ZHANG[1, 2, 4], P. ROGL[1], A. GRYTSIV[1], D. RAJS[2], M. KRIEGISCH[2], H. MÜLLER[2], E. BAUER[2], S. PUCHEGGER[3], J. KOPPENSTEINER[3], W. SCHRANZ[3], M. ZEHETBAUER[4], [1]Institute of Physical Chemistry, University of Vienna, Wien, Austria; [2]Institute of Solid State Physics, TU-Wien, Wien, Austria; [3]Nonlinear Physics Group, University of Vienna, Wien, Austria; [4]Group Physics of Nanostructured Materials, University of Vienna, Wien, Austria

FE-2:L29 **Size Quantization in Lead Selenide 2D - Nanostructures**
E.I. ROGACHEVA, O.N. NASHCHEKINA, S.I. OL'KHOVSKAYA, A.Y. SIPATOV, A.G. FEDOROV, M.S. DRESSELHAUS, National Technical University "Kharkov Polytechnic Institute", Kharkov, Ukraine

FE-2:L30 **Low-temperature Properties of Layered g-CaxCoO2 Compound**
JINFENG LIU, **XIANGYANG HUANG**, LIDONG CHEN, Shanghai Institute of Ceramics, CAS, Shanghai, China

Session FE-3
Progress in Devices and Applications

FE-3:IL01 **Solar Thermoelectric Generation**
R.J. RAM, Reja Amatya Research Lab. of Electronics, Massachusetts Institute of Technology, Cambridge, MA, USA

FE-3:IL02 **Thermoelectric Application for Power Generation in Japan**
T. KAJIKAWA, Shonan Institute of Technology, Fujisawa, Kanagawa, Japan

FE-3:L03 **The Preparation of Thermoelectric Active Tapes and Layers from Slurries**
F. SCHEFFLER, M. SCHEFFLER, Otto-von-Guericke-University, Magdeburg, Germany

FE-3:L04 **Modular Combustor-radiator for Micro-TPV System Application**
S.K. CHOU, W.M. YANG, J.LI, Dept. of Mechanical Engineering, National University of Singapore, Singapore

FE-3:L05 **Vehicular Thermoelectric and Air Conditioner/Heater Development**
J. FAIRBANKS, US Dept. of Energy, Washington, DC, USA

FE-3:IL06 **Micro Peltier Devices for Cooling and for Power Generation**
H. BÖTTNER, Fraunhofer-Institute Physical Measurement Techniques IPM, Dept. for Thermoelectric Systems, Freiburg, Germany

FE-3:IL07 **Automotive Applications of Thermoelectricity**
JIHUI YANG, GM R&D Center, Warren, MI, USA

FE-3:L08 **Development of Thermoelectric Modules Based on Bulk Oxide Materials**
P. MELE, K. MATSUMOTO, K. MIYAZAKI, H. YASUMUNE, M. NAGATA, Dept. of Materials Science and Engineering, Kyushu Institute of Technology (KIT), Kitakyushu, Japan and Fukuoka Industry, Science and Technology Foundation (IST), System LSI Division, Fukuoka, Japan

FE-3:L09 **Design and Fabrication of Filled Skutterudite Device**
XIAOYA LI, JINGCHENG LIAO, YUNSHAN TANG, XUGUI XIA, XIANGYANG HUANG, LIDONG CHEN, Shanghai Institute of Ceramics, Chinese Academy of Science, Shanghai, China

FE-3:L10 **Recovery of Waste Heat from the Exhaust of Small Automotive Engines**
K.T. WOJCIECHOWSKI, M. SCHMIDT, R. ZYBALA, J. MERKISZ, P. FUC, P. LIJEWSKI, Dept. of Inorganic Chemistry, AGH University of Science and Technology, Cracow, Poland

Poster Presentations

FE:P01 **Theoretical Study and Design for High Thermoelectric Properties for AgxTeyTlz Compound with First Principle Band Calculation**
H. FUNASHIMA, N. HAMADA, Dept. of Physics, Tokyo University of Science, Noda, Japan

FE:P02 **Preparation of Multiphase Composites Including Sr, Ti and Nb Oxides, and Their Thermoelectric Properties**
K. FUDA, T. SHOJI, Dept. of Applied Chemistry for Environments, Akita Univ., Akita, Japan; S. SUGIYAMA, Akita pref. Ind. Tech. Center, Akita, Japan

FE:P03 **Improved Thermoelectrics Based on Bismuth and Antimony Chalcogenides for Temperatures Below 240 K**
L.N. LUKYANOVA, V.A. KUTASOV, P.P. KONSTANTINOV, V.V. POPOV, Ioffe Physical-Technical Institute of the RAS, Lab. for Physics of Thermoelements, St. Petersburg, Russian Federation

FE:P04 **Characterization and Properties of Nano-crystalline Mg2Si Prepared by the Ball Milling Process**
M. IOANNOU[1], E. HATZIKRANIOTIS[2], K.M. PARASKEVOPOULOS[2], **TH. KYRATSI**[1], [1]Dept. of Mechanical and Manufacturing Eng., University of Cyprus, Nicosia, Cyprus; [2]Dept. of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece

FE:P05 **The Resonant States of Tin in Bi2Te3 - based Compounds**
M.K. ZHITINSKAYA, S.A. NEMOV, St. Petersburg State Polytech. Univ., St. Petersburg, Russia, T.E. SVECHNIKOVA, Moscow, Baikov Institute Metallurgy and Materials Sciences, RAS, Russia

FE:P06 **Heat Treatment on Ball-Milled K2Bi8Se13 Thermoelectric Materials**
M. IOANNOU[1], E. HATZIKRANIOTIS[2], K. CHRISSAFIS[2]), D.Y. CHUNG[3], K.M. PARASKEVOPOULOS[2], TH. KYRATSI[1], [1]Dept. of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus; [2]Dept. of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece; [3]Materials Science Division, Argonne National Laboratory, Argonne, IL, USA

FE:P07 **PbTe-Sb2Te3 Nanocomposites Prepared by Mechanical Alloying: Microstructure and Thermoelectric Properties**
CH. PAPAGEORGIOU, J. GIAPINTZAKIS, TH. KYRATSI, Dept. of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus

FE:P08 **Mg2Si Thin Film Preparation for Thermoelectric Applications**
M. ANGELAKERIS[1], **E. HATZIKRANIOTIS**[1], TH. KYRATSI[2], K.M. PARASKEVOPOULOS[1], [1]Dept. of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece; [2]Dept. of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus

FE:P09 **Raman Spectroscopy Study on Na2/3Mn1-xFexO2 Oxides**
M. SENDOVA-VASSILEVA[1], R. STOYANOVA[2, 3], D. CARLIER[3], M. YONCHEVA[2], E. ZHECHEVA[2], C. DELMAS[3]; [1]Central Lab. of Solar Energy and New Energy Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria; [2]Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Sofia, Bulgaria; [3]Institut de Chimie de la Matiere Condensee de Bordeaux, ICMCB-CNRS and ENSCPB Universite Bordeaux I, Pessac, France

SYMPOSIUM FF
MATERIALS CHALLENGES FOR FUTURE NUCLEAR FISSION AND FUSION TECHNOLOGIES

Oral Presentations

Keynote Lecture

FF:KL **Crosscutting Materials Issues for Next-generation Fission and Fusion Energy Systems**
S.J. ZINKLE, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Session FF-1
Structural Components for Fission and Fusion Applications

FF-1:IL01 **Material Development for GFR Core Components**
M. LE FLEM, L. CHAFFRON, J.L. SERAN, CEA Saclay, DEN/DMN, Gif-sur-Yvette, France

FF-1:IL02 **Structural Materials Development and Characterisation for Innovative Reactor and Transmutation Systems: The EU Project GETMAT**
C. FAZIO, M. RIETH, Karlsruhe Institute of Technology, KIT, Eggenstein-Leopoldshafen, Germany; P. AALTONEN, Technical Research Centre of Finland, VTT, Finland; L.G. BRICENO, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, CIEMAT, Spain; A. GESSI, ENEA, Italy; J. HENRY, Commissariat a l'Énergie Atomique, CEA, France; W. HOFFELNER, Paul Scherrer Institute, PSI, Switzerland; L. MALERBA, J. VAN DEN BOSCH, Centre D'Étude de L'Énergie Nucléaire, SCK-CEN, Belgium

FF-1:IL03 **Atomic Scale Modeling of Fe Alloys**
A. CARO, Lawrence Livermore National Laboratory, Livermore, CA, USA

FF-1:IL04 **Tungsten as a Structural Divertor Material**
M. RIETH, E. MATERNA-MORRIS, M. ROHDE, Forschungszentrum Karlsruhe, Institut für Materialforschung I, Karlsruhe, Germany; A. HOFFMANN, PLANSEE Metall GmbH, Development Refractory Alloys, Reutte, Austria

FF-1:L05 **Development of Structural Materials for a High Temperature Gas Cooled Reactor in KAERI**
JI YEON PARK, DONG JIN KIM, DAE HWAN KIM, WOO GON KIM, SUNG HO KIM, CHOONG HWAN JUNG, SE HWAN CHI, Korea Atomic Energy Research Institute, Daejeon, Korea

FF-1:L06 **Thermomechanical Behavior of Silicon Carbide**
M. DENITIU, M. LE FLEM, CEA Saclay, DEN/DMN/SRMA/LA2M, Gif-sur-Yvette, France; M. BOUSSUGE, Centre des Matériaux, Ecole Nationale Superieure des Mines de Paris ParisTech, France

FF-1:L07 **Behaviors of SiC Fibers up to High Temperature**
C. COLIN, V. FALANGA, M. MAXEL, K. SHIMODA, D. GOSSET, CEA, DEN, DMN, SRMA, CEA-Saclay, Gif-sur-Yvette, France; C. CABET, CEA, DEN, DPC, SCCME, CEA-Saclay, Gif-sur-Yvette, France

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

FF-2:IL01 **RAFM Steel Materials for DEMO: Properties After Irradiation**
A. MÖSLANG, Karlsruhe Institute of Technology (KIT), Institute of Materials Research I (IMF1), Eggenstein-Leopoldshafen, Germany

FF-2:IL02 **Super ODS Steels R&D for Cladding Material of Next Generation Nuclear Systems**
A. KIMURA[1], R. KASADA[1], N. IWATA[1], J. ISSELIN[1], P. DOU[1], J.H. LEE[1], T. OKUDA[2], M. INOUE[3], S. UKAI[4], S. OHNUKI[4], T. FUJISAWA[5], F. ABE[6], [1]Institute of Advanced Energy, Kyoto University, Kyoto; [2]KOBELCO Research Institute, Kobe; [3]Japan Atomic Energy Agency, Oarai, Ibaraki; [4]Hokkaido University, Sapporo; [5]Nagoya University, Nagoya; [6]National Institute of Materials Science, Tsukuba, Japan

FF-2:IL03 **Development of Nanostructured Ferritic Alloys**
D. HOELZER, J. BENTLEY, M.K. MILLER, M.A. SOKOLOV, Oak Ridge National Laboratory, Oak Ridge, TN, USA; M. LI, Argonne National Laboratory, Argonne, IL, USA

FF-2:IL04 **Metallic and Ceramic Low Activation Structural Materials For In-vessel Components of Future Fusion Reactors**
M. RUBEL, Alfvén Laboratory, Royal Institute of Technology, Association Euratom - VR, Stockholm, Sweden; J. LINKE, Institute of Energy Research, Forschungszentrum Jülich, Association Euratom, Jülich, Germany; M. RIETH, Forschungszentrum Karlsruhe, Association Euratom - FZK, Karlsruhe, Germany

FF-2:IL05 **Ceramic Composites for Fission and Fusion Applications**
Y. KATOH, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA

FF-2:IL06 **Development of Low Activation Vanadium-based Alloys for Nuclear Fusion Applications**
T. MUROGA, National Institute for Fusion Science, Oroshi, Toki, Gifu, Japan

FF-2:IL07 **SiCf/SiC Composites Irradiation Behaviour in Fusion Reactor Environment Conditions**
JI-JUNG KAI, Center for Energy and Environmental Research, Dept. of Eng. and System Science, National Tsing Hua University, Hsinchu, Taiwan, R.O.C.

FF-2:L08 **Thermo-mechanical and Electrical Behaviours of Ion-irradiated SiC Fibers for Nuclear Applications**
K. SHIMODA, C. COLIN, DEN/DANS/DMN/SRMA, CEA-Saclay, Gif-sur-Yvette, France

FF-2:L09 **Experimental Development at a Pilot Plant Scale of a Reduced Activation Ferritic/Martensitic RAFM Steel**
A. MORÁN, J. BELZUNCE, J.M. ARTÍMEZ, Fundación ITMA Parque Empresarial Principado de Asturias, Avilés, Asturias, Spain

FF-2:L10 **Corrosion Analysis of the Candidate Structural Materials for Fusion Reactor in DRAGON Series LiPb Loops and Static Capsules**
Q.Y. HUANG, Z.Q. ZHU, S. GAO, Y.P. CHEN, X.Z. LING, Y.L. CHEN, Y.C. WU, FDS Team, Institute of Plasma Physics, Chinese Academy of Science, Hefei, Anhui, China

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

FF-3:IL01 **Plasma Facing Component Challenges in Magnetic Fusion Energy**
D.G. WHYTE, MIT Plasma Science & Fusion Center, Cambridge, MA, USA

FF-3:IL02 **Radiation Effects on First Wall Components for Fusion Power Reactors**
N. BALUC, EPFL, Centre de Recherche en Physique des Plasmas, Association Euratom-Confédération Suisse, Switzerland

FF-3:IL03 **Plasma-materials Interactions in Fusion Devices**
E. TSITRONE, CEA, IRFM, Saint-Paul-lez-Durance, France

FF-3:IL04 **Status of Silicon Carbide Composites for Fusion First Wall Applications**
L.L. SNEAD, Y. KATOH, Oak Ridge National Laboratory, Oak Ridge, TN, USA

FF-3:IL05 **Effect of Plasma-facing Materials on the Tritium Inventory in Fusion Devices**
J. ROTH, K. SCHMID, CH. LINSMEIER, Max-Planck-Institut für Plasmaphysik, EURATOM Association, Garching b. München, Germany

FF-3:IL06 **Materials Challenges for Plasma-facing Materials in Future Fusion Reactors**
H. BOLT, J.LINKE, Forschungszentrum Juelich, Juelich, Germany; Ch. LINSMEIER, Max Planck Institute for Plasma Physics, Garching, Germany

FF-3:L07 **Fabrication and Characterization of Magnetron Sputtered Tungsten/EUROFER 97 Coatings**
T. WEBER[1], M. STÜBER[2], S. ULRICH[2], J. AKTAA[1], [1]Karlsruhe Institute of Technology, Inst. for Materials Research II, Eggenstein-Leopoldshafen, Germany; [2]Karlsruhe Institute of Technology, Inst. for Materials Research I, Eggenstein-Leopoldshafen, Germany

Session FF-4
Functional Materials

FF-4:IL01 **Materials Challenges for the Next Generation Nuclear Plant Very High Temperature Reactor**
R.E. MIZIA, Idaho National Laboratory, Idaho Falls, ID, USA

FF-4:IL02 **Study of Radioluminescence on Functional Ceramics for Nuclear Fusion Application**
T. SHIKAMA, S. NAGATA, H. KATSUI, B. TSUCHIYA, Institute for Materials Research, Tohoku University, Sendai, Japan

FF-4:IL03 **Performance Assessment of Ceramic Breeder Materials and Their Testing**
J.G. VAN DER LAAN, Nuclear Research & Consultancy Group, Petten, The Netherlands

FF-4:IL04 **Utilization of Hybride Materials in Nuclear Reactors**
K. KONASHI, M. YAMAWAKI, Institute for Materials Research, Tohoku University, Ibaraki, Japan; Dept. of Energy, Tokai University, Kanagawa, Japan

Session FF-5
Nuclear Fuel Materials

FF-5:IL01 **Modelling Integral Fuel Behaviour - An Overview of Recent Developments and Future Requirements**
P. VAN UFFELEN, A. SCHUBERT, J. VAN DE LAAR, EC, JRC, Institute for Transuranium Elements, Eggenstein-Leopoldshafen, Germany

FF-5:IL02 **From High Enriched to Low Enriched Uranium Fuel in Research Reactors**
L. SANNEN, S. VAN DEN BERGHE, A. LEENAERS, SCK.CEN, NMS(LHMA), Mol, Belgium

FF-5:L03 **Preparation and Characterisation of UyAm1-yO2-x for Transmutation in Fast Neutrons Reactor**
D. PRIEUR, A. JANKOWIAK, C. LEORIER, N. HERLET, CEA/DEN/DTEC/SDTC/LEMA, Bagnols-sur-Ceze, France; L. DONNET, P. DEHAUDT, CEA/DEN/DTEC/SDTC/DIR; C. MAILLARD, CEA/DEN/DRCP/SE2A/LEHA; J-P. LAVAL, SPCTS Université de Limoges; P. BLANCHART, GEMH ENSCI, Université de Limoges, France

FF-5:L05 **Simulation and Modelling the Heterogeneous Effects of the Microstructure MOX Fuels on their Effective Properties in Nominal Pressure Water Reactor Conditions**
R. LARGENTON[1], V. BLANC[2], P. THEVENIN[1], D. BARON[1], [1]EDF R&D, MMC/CPCM, Site des Renardieres, Moret Sur Loing, France; [2]CEA Cadarache DEN/CAD/SESC/LSC, St Paul lez Durance, France

FF-5:IL06 **Fabrication of Fuel and Recycling of Minor Actinides in Fast Reactors**
J. SOMERS, JRC-ITU, Karlsruhe, Germany

FF-5:IL07 **Metallic Liners for SiCf/SiC Fuel Cladding**
F. AUDUBERT, CEA, DEN, DEC, SPUA, Cadarache, St Paul lez Durance, France; J. ROGER, CEA, LCTS, France; Y. LE PETITCORPS, Université de Bordeaux, LCTS, France

FF-5:IL08 **Advanced Measurement Techniques for Highly Radioactive Materials**
J.R. KENNEDY, M.K. FIG, J.I. COLE, D.E. JANNEY, Idaho National Laboratory, Idaho Falls, ID, USA

Session FF-6
Radiation Effects

FF-6:IL01 **Computer Simulation of Primary Radiation Damage**
K. NORDLUND, Dept. of Physics, University of Helsinki, Helsinki, Finland

FF-6:IL02 **Radiation-induced Segregation in Austenitic and Ferritic-martensitic Steels**
G.S. WAS, J.P. WHARRY, University of Michigan, Ann Arbor, MI, USA; B. WIRTH, University of California, Berkeley, CA, USA

FF-6:IL03 **Direct In-situ Electron Microscope Observations of Dynamics of Radiation Defects in Irradiated Materials**
K. ARAKAWA, H. MORI, Research Center for Ultra-High Voltage Electron Microscopy, Osaka University, Ibaraki, Osaka, Japan

FF-6:L04 **On the Origin of Large Interstitial Clusters in Displacement Cascades in Iron**
A.F. CALDER, D.J. BACON, A.V. BARASHEV, The University of Liverpool, Liverpool, UK; Yu.N. OSETSKY, Oak Ridge National Laboratory, Oak Ridge, TN, USA

FF-6:IL05 **Radiation Damage in Ferritic High-Cr Alloys for Nuclear Applications**
D. TERENTYEV, L. MALERBA, G. BONNY, N. CASTIN, Structural Materials Group, Nuclear Materials Science Inst., Centre d'études de l'Energie Nucléaire (SCK.CEN), Mol, Belgium; X. HE, China Inst. of Atomic Energy, Beijing, China

FF-6:IL06 **Evolution of Nano-structures in Pressure Vessel Steels in the Course of Irradiation**
Y. NAGAI, T. TOYAMA, M. HASEGAWA, IMR, Tohoku University, Japan; T. OHKUBO, NIMS, Japan; A. ALMAZOUZI, E. VAN WALLE, SCK/CEN, Belgium; R. GERARD, Tractebel, Belgium

FF-6:L07 **The Influence of Interaction Geometry on the Obstacle Strength of Voids and Copper Precipitates in Iron**
P. GRAMMATIKOPOULOS, D.J. BACON, University of Liverpool, Liverpool, UK; Yu.N. OSETSKY, Oak Ridge National Laboratory, Oak Ridge, TN, USA

FF-6:L08 **Residual Stress Analysis of SiC/SiC Composites Following Irradiation**
T. KOYANAGI, Graduate School of Energy Science, Kyoto University, Kyoto, Japan; S. KONDO, T. HINOKI, Institute of Advanced Enegy, Kyoto University, Kyoto, Japan

FF-6:L09 **Atomic-scale Mechanisms of Strengthening Due to Localized Obstacles in Irradiated Metals**
Y. OSETSKY, R. STOLLER, Materials Science and Technology Division, ORNL, Oak Ridge, TN, USA; D. BACON, Dept. of Engineering, University of Liverpool, Liverpool, UK

FF-6:L10 **Quantitative TEM Investigations on EUROFER 97 Irradiated up to 32 dpa**
O.J. WEIß, E. GAGANIDZE, J. AKTAA, Karlsruhe Institute of Technology, Institute for Materials Research II, Eggenstein-Leopoldshafen, Germany

FF-6:L11 **Microstructure Change of Ti3(Si,Al)C2 After Ion Irradiation**
M. LE FLEM, X.M. LIU, S. DORIOT, T. COZZIKA, J.L. BECHADE, CEA Saclay, DEN/DMN/SRMA, Gif sur Yvette, France; **I. MONNET**, Centre Interdisciplinaire de Recherches Ions Lasers - CIRIL, Caen, France

FF-6:L12 **Irradiation Behavior of Nanostructurally-stabilized Pure Cubic Zirconia**
YANWEN ZHANG, WEILIN JIANG, W.J. WEBER, Pacific Northwest National Laboratory, Richland, WA, USA; F. NAMAVAR, University of Nebraska Medical Center, Omaha, NE, USA

FF-6:IL13 **The Change of Thermo-mechanical Properties Resulting from Irradiation**
J. LINKE, G. PINTSUK, M. RÖDIG, A. SCHMIDT, Forschungszentrum Jülich, Euratom Association, Jülich, Germany

FF-6:IL14 **Irradiation-induced Nanoscale Self-organization: Simulations, Experiments, and Application to Radiation-resistance**
P. BELLON, R.S. AVERBACK, S.W. CHEE, A. DAMODARAN, N. VO, B. STUMPHY, Dept. of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA

FF-6:L15 **Electronic Structure Calculations of Stability of Point Defects and Volatile Elements in Uranium and Silicon Carbides**
M. BERTOLUS, M. FREYSS, CEA, DEN, Centre de Cadarache, Saint Paul lez Durance, France

FF-6:L16 **SANS Investigation of Phase Precipitation in HT-9 at High Neutron Irradiation Dose Levels**
J. VAN DEN BOSCH, P. HOSEMANN, T. ROMERO, R.P. HJELM, S.A. MALOY, Los Alamos National Laboratory, Los Alamos, NM, USA

FF-6:L17 **Modeling of the Radiation Damage and Recovery Based on the Interaction of Crystal Defects with Quodons**
V. DUBINKO, NSC Kharkov Inst. of Physics and Technology, Kharkov, Ukraine

FF-6:IL18 **Interaction of Twin Boundaries with Radiation Damage in hcp Metals**
A. SERRA, D.J. BACON, Dept. of Applied Mathematics III, Technical University of Catalonia, Barcelona, Spain; Dept. of Engineering, The University of Liverpool, Liverpool, UK

FF-6:IL19 **An Atomic-based Mesoscale Model of Radiation Induced Segregation**
M. NASTAR, DEN/DMN/SRMP, CEA Saclay, Gif-sur-Yvette, France

FF-6:L20 **Non-equilibrium Thermodynamics of Irradiated Alloy Fuels**
A. EL-AZAB, Dept. of Scientific Computing & Materials Science Program, Florida State University, Tallahassee, FL, USA; S. DUBEY, Dept. of Scientific Computing, Florida State University, Tallahassee, FL, USA; D. WOLF, Fuel Properties and Modeling, Idaho National Laboratory, Idaho Falls, ID, USA

FF-6:L21 **Microchemical Evolution Under Irradiation of Fe Dilute Alloys Representative of RPV Steels by Atomic Kinetic Monte Carlo**
R. NGAYAM-HAPPY[1, 2], C.S. BECQUART[2], C. DOMAIN[1], [1]EDF-R&D, Dép. MMC, Moret sur Loing, France; [2]Lab. de Métallurgie Physique et Génie des Matériaux, UMR 8517, Université de Lille 1, ENSCL, Villeneuve d'Ascq, France

FF-6:L22 **Irradiation Effect on Properties of Nanostructured Materials**
R.A. ANDRIEVSKIY, Institute of Problems of Chemical Physics, RAS, Chernogolovka, Moscow Region, Russia

FF-6:L23 **Nucleation Free Energy of Copper-vacancy Clusters in bcc-Fe: An Atomistic Study**
M. POSSELT, Forschungszentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, Dresden, Germany; A.T. AL-MOTASEM, M. TALATI, F. BERGNER, U. BIRKENHEUER, Forschungszentrum Dresden-Rossendorf, Institute of Safety Research, Germany

Session FF-7
Materials Modeling and Database

FF-7:IL01 **A Material Data Base and Properties Handbook for ITER**
V. BARABASH, M. MEROLA, K. IOKI, N. MITCHELL, G. SANNAZZARO, N. TAYLOR, ITER Organization, St Paul Lez Durance, France

FF-7:IL02 **Multiscale Modelling of Radiation Effects in Fusion Materials**
S.L. DUDAREV, UKAEA Culham Centre for Fusion Energy, Abingdon, Oxfordshire, UK

FF-7:IL03 **Atomic Scale Investigation of Y-Ti-O Nanoclusters in Nanostructured Ferritic Alloys**
B.D. WIRTH[1], M.J. ALINGER[2], H.-J. LEE[1], L. MARUS[1], G.R. ODETTE[3], B.S. WANG[1], [1]Dept. of Nuclear Eng., University of California, Berkeley, CA, USA; [2]GE Global Research and Development, USA; [3]Dept. of Mechanical and Environmental Eng., University of California, Santa Barbara, CA, USA

FF-7:L04 **Modelling Steels Used in Nuclear Energy Applications**
M. SAMARAS, HT-MAT, LMN, NES, Paul Scherrer Institute, Switzerland

FF-7:L05 **Multiscale Modelling of the Influence of Damage on Thermal Properties During Tensile Loading of Ceramic Matrix Composites**
J. EL YAGOUBI, J. LAMON, L.C.T.S, Pessac, France; J.C. BATSALE, TREFLE, Talence, France

FF-7:L06 **From Point Defect Clusters to Threshold Displacement Energies in Iron by Ab Initio Methods**
P. OLSSON, C. DOMAIN, EDF R&D, Dept. MMC, Les Renardieres, Moret sur Loing, France

FF-7:L07 **Models and Simulations of Nuclear Fuels**
M. STAN, Los Alamos National Laboratory, Los Alamos, NM, USA

FF-7:IL08 **Experiments and Modelling for Evaluation of Neutron Irradiation Embrittlement of Reactor Pressure Vessel Steels in Fission Reactors**
N. SONEDA, K. DOHI, K. NISHIDA, A. NOMOTO, Central Research Institute of Electric Power Industry, Komae, Tokyo, Japan

FF-7:IL09 **Multi-scale Modeling of Irradiation Effects on Nuclear Fuel Microstructure**
D. WOLF, Idaho National Laboratory, Idaho Falls, ID, USA

FF-7:IL10 **Demented Rabbits, or the Complexity and Stability of Materials Under Extreme Irradiation Environments**
P.M. DERLET, S.L. DUDAREV, Condensed Matter Theory Group, Paul Scherrer Institute, PSI-Villigen, Switzerland; Culham Centre for Fusion Energy, Abingdon, Oxfordshire, UK

FF-7:IL11 **Defect Clusters and Helium-vacancy Clusters in Iron and Other bcc Metals from First Principles**
F. WILLAIME, CHU CHUN FU, M.-C. MARINICA, L. VENTELON, Service de Recherches de Métallurgie Physique, CEA, Gif-sur-Yvette, France

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

FF-8:IL01 **Cross-cutting Issues Related to Structural Materials in Fission and Fusion**
F. TAVASSOLI, DEN/DMN, CEA/Saclay, Gif-sur-Yvette, France

FF-8:IL02 **Assessing Fracture Toughness of Steels by the Use of Small Specimen Test Technology (SSTT)**
E. LUCON, Materials Reliability Division, National Institute of Standards and Technology (NIST), Boulder, CO, USA

FF-8:IL03 **Materials for Nuclear Applications - Bridges Between Fission and Fusion**
BALDEV RAJ, A.K. BHADURI, Indira Gandhi Centre for Atomic Research, Kalpakkam, India

FF-8:IL04 **From Model-alloys to Ferritic-Martensitic and Ferritic Oxide Dispersion Strengthened Steels: The Fusion-fission Synergies**
J.-L. BOUTARD, Materials Consultant, DEN/RB CEA/Saclay, Gif sur Yvette, France

FF-8:IL05 **An Overview of Life Limiting Irradiation Damage Degradation Phenomena in Reduced Activation 9Cr Steels**
G.R. ODETTE, T. YAMAMOTO, University of California, Santa Barbara, CA, USA

Session FF-9
System Integration and Interface Design

FF-9:IL01 **Joining SiC Ceramics and Composites for Fusion and Nuclear Applications**
M. FERRARIS, V. CASALEGNO, S. HAN, S. RIZZO, M. SALVO, A. VENTRELLA, Politecnico di Torino, Dip. di Scienza dei Materiali e Ingegneria Chimica-DISMIC, Torino, Italy

FF-9:IL02 **Design and Integration of ITER Divertor Components**
T. HIRAI, F. ESCOURBIAC, T. JOKINEN, V. KOMAROV, A. MARTIN, M. MEROLA, ITER Organization, St Paul-lez-Durance, France

Poster Presentations

FF:P01 **General Corrosion Properties of Modified PNC1520 Austenitic Stainless Steel in Supercritical Water as a Fuel Cladding Candidate Material for Supercritical Water Reactor**
Y. NAKAZONO[1], T. IWAI[1], H. ABE[2] (formerly [1]), [1]Nuclear Professional School, School of Engineering, the University of Tokyo, Tokai, Ibaraki, Japan; [2]Material Design Division, Institute for Material Research, Tohoku University, Japan

FF:P02 **High-temperature Corrosion of Inconel 625 in Supercritical Water**
JIH-HSUAN HUANG, **TSUN-PIN YEN**, TSUNG-KUANG YEH, FU-RONG CHEN, JI-JUNG KAI, Dept. of Engineering and System Science, National Tsing-Hua University, HsinChu, Taiwan

FF:P03 **Development of Fe-base and Ni-base ODS Alloys for Advanced Nuclear Fission Application**
S. UKAI, Y. SUGINO, B. LENG, Q. TANG, S. HAYASHI, Hokkaido University, Sapporo, Japan; T. KAITO, S. OHTSUKA, Japan Atomic Energy Agency, Oarai, Japan

FF:P04 **Effect of Mercury on the Fracture Toughness of Ferritic-martensitic and Austenitic Steels Loaded in Plain Strain Conditions**
R. HERNANDEZ-CALLEJAS, **L. MEDINA-ALMAZÁN**, Instituto Nacional de Investigaciones Nucleares, Ocoyoacac, Mexico; T. AUGER, MSSMat UMR-CNRS 8579, Ecole Centrale Paris, Chatenay-Malabry, France; D. GORSE-POMONTI, Lab. des Solides Irradiés, UMR CNRS 7642, Ecole Polytechnique, Palaiseau, France

FF:P05 **Preparation of SiCf/SiC Composites by Slip Infiltration and Moderate Temperature Densification**
S. NOVAK, G. DRAZI, K. KÖNIG, A. IVEKOVIC, Dept. for Nanostructured Material, Jozef Stefan Institute, Slovenia Slovenian Fusion Association (SFA) EURATOM-MHEST, Ljubljana, Slovenia

FF:P06 **The Influence of Helium and ODS on the Irradiation-induced Hardening of Eurofer97 at 300 °C**
C. HEINTZE[1], F. BERGNER[1], R. LINDAU[2], R. KOEGLER[1], [1]Forschungszentrum Dresden-Rossendorf, Dresden, Germany; [2]Forschungszentrum Karlsruhe, Karlsruhe, Germany

FF:P07 **Progressive Development for Structural Integrity Quantification of Nuclear Grade Graphite in Very High Temperature Gas Cooled Reactor Core Environments**
SHUO-CHENG TSAI, JI-JUNG KAI, FU-RONG CHEN, YI-TSANG HSIEH, Center for Electron Microscopy, Dept. of Engineering and System Science, National Tsing-Hua University, HsinChu, Taiwan, R.O.C.

Focused Session FF-10
MATERIALS TECHNOLOGY FOR NUCLEAR WASTE TREATMENT AND DISPOSAL

Oral Presentations

Session FF-10.1
Waste Form Development

FF-10.1:IL01 **Advantages Hot Isostatically Pressed Ceramic and Glass-ceramic Waste Forms Bring to the Immobilization of Challenging Intermediate- and High-level Nuclear Wastes**
E.R. VANCE, S. MORICCA, B.D. BEGG, M.W.A. STEWART, Y. ZHANG, M.L. CARTER, Australian Nuclear Science and Technology Organisation, Menai, NSW, Australia

FF-10.1:IL02 **Overview of Nuclear Waste Treatment Research Activities at Forschungszentrum Jülich**
D. BOSBACH, Institute for Energy Research (IEF-6), Forschungszentrum Jülich GmbH, Jülich, Germany

FF-10.1:L03 **"DuraLith" - A Geopolymer Radioactive Waste Form**
W.L. GONG, W. LUTZE, I.L. PEGG, The Catholic University of America, Washington, DC, USA

FF-10.1:L04 **Synthesis and Properties of Reaction-bonded SiC Ceramic with Embedded UO2 - TRISO Coated Particles**
A.A. BUKAEMSKIY, J. FACHINGER, D. BOSBACH, Forschungszentrum Jülich GmbH, IEF-6, Jülich, Germany

FF-10.1:IL05 **Actinide-REE Host Phases with Fluorite-related Structures**
S. YUDINTSEV, IGEM RAS, Moscow, Russia

FF-10.1:IL06 **Zirconia-based Waste Forms from Spent Fuel Rod Treatment**
P.E. RAISON[1], C. PAVEL[1], M. STEINBRÜCK[2], T WISS[1], D. BOTTOMLEY[1], R.J. KONINGS[1], V. RONDINELLA[1], [1]European Commission, Joint Research Centre Inst. for Transuranium Elements, Karlsruhe, Germany; [2]Karlsruhe Inst. of Technology, GmbH, Institut für Materialforschung I, Karlsruhe, Germany

FF-10.1:L07 **Phosphates with Langbeinite Type Structure. Isomorphism and Radwaste Solidification**
A.I. ORLOVA, **A.K. KORYTTSEVA**, E.E. LOGINOVA, Nizhny Novgorod State University, Nizhny Novgorod, Russia

FF-10.1:L08 **New Actinide Waste Forms with Pyrochlore and Garnet Structures**
T.S. LIVSHITS, S.V. YUDINTSEV, IGEM RAS, Moscow, Russia; S.V. STEFANOVSKY, SIA Radon, Moscow, Russia; R.C. EWING, University of Michigan, Ann Arbor, MI, USA

Session FF-10.2
Methods of Processing Challenging Waste Constituents, Such as Actinides and Noble Metals

FF-10.2:IL01 **Advanced ORIENT Cycle for Turning Radioactive Waste into Resource**
MASAKI OZAWA, Japan Atomic Energy Agency, Tokyo Institute of Technology, Tokai-mura, Ibaraki-ken, Japan

FF-10.2:IL02 **The Role of Noble Metals in HLLW Vitrification**
G. ROTH, Karlsruhe Institute of Technology, Institut für Nukleare Entsorgung, Eggenstein-Leopoldshafen, Germany

FF-10.2:IL03 **On Nanostructured Hydrogen Catalysts, Fission-product Alloy Particles Extracted from Spent Nuclear Fuel**
DAQING CUI, Studsvik AB, Nyköping, Sweden, and Stockholm University, Dept. of Material and Environmental Science, Stockholm, Sweden

FF-10.2:L04 **Co-conversion of Actinides into a Uranium Matrix**
H. DANIELS, S. NEUMEIER, A.A. BUKAEMSKIY, G. MODOLO, D. BOSBACH, Forschungszentrum Jülich GmbH, IEF-6, Jülich, Germany

FF-10.2:IL05 **Vitrification of Halide Containing Wastes**
R.J. HAND, J.M. SCHOFIELD, P.A. BINGHAM, Immobilisation Science Lab., Dept. of Engineering Materials, University of Sheffield, Sheffield, UK

FF-10.2:IL06 **Sulfur Incorporation in Borosilicate Glass - A Challenge for Vitrification Facilities Processing High Sulfur Bearing HLLW**
S. WEISENBURGER, Karlsruhe Institute of Technology (KIT), Institut für Nukleare Entsorgung (INE), Eggenstein-Leopoldshafen, Germany

FF-10.2:IL07 **An Innovative Hybrid Process Involving Plasma in a Cold Crucible Melter Devoted to the Future Intermediate Level Waste Treatment: The SHIVA Technology**
F. LEMONT, P. CHARVIN, A. RUSSELLO, K. POIZOT, CEA - French Atomic Energy Commission, Bagnols sur Cèze, France

FF-10.2:L08 **Recovery of Long-lived Minor Actinides from High Active Waste Solutions Using Innovative Partitioning Processes**
G. MODOLO, D. BOSBACH, Inst. for Energy Research, Forschungszentrum Jülich GmbH, IEF-6, Jülich, Germany; A. GEIST, Inst. für Nukleare Entsorgung, Forschungszentrum Karlsruhe GmbH, INE, Karlsruhe, Germany; R. MALMBECK, European Commission, JRC, Inst. for Transuranium Elements, Karlsruhe, Germany

Session FF-10.3
Waste Form Modeling, Performance and Characterisation

FF-10.3:IL01 **Development of New Waste Forms to Immobilize Iodine-129 Released from Spent Fuel Reprocessing Plant**
H. TANABE, T. SAKURAGI, Radioactive Waste Management Funding and Research Center, Tokyo, Japan

FF-10.3:IL02 **Measurement of Radiation Damage in Nuclear Materials with High-resolution Nuclear Magnetic Resonance**
I. FARNAN, K.M. GUNDERSON, C. BRIGDEN, University of Cambridge, Cambridge, UK; H.M. CHO, W.J. WEBER, Pacific Northwest National Laboratory, USA; E.R. VANCE, J.V. HANNA, Australian Nuclear Science and Technology Organisation, Australia

FF-10.3:L03 **Is the Aqueous Corrosion of Borosilicate Glass Really Controlled by Diffusion Processes?**
T. GEISLER, A. JANSSEN, R. DENKLER, J. BERNDT, T. STEPHAN, A. PUTNIS, Institut für Mineralogie, University of Münster, Münster, Germany; Dept. of the Geophysical Sciences, University of Chicago, Chicago, IL, USA

FF-10.3:L04 **Identification of a Secondary Crystallized Phase formed during Nuclear Glasses Leaching - Effect of the Leached Glass Composition**
B. THIEN, N. GODON, CEA Marcoule, France; A. AYRAL, IEM Montpellier, France

FF-10.3:IL05 **The GRAAL Model: a Tool for Predicting Long-term Nuclear Glass Dissolution Kinetics**
S. GIN, P. FRUGIER, Y. MINET, B. BONIN, CEA, DEN, Bagnols sur Ceze, France

FF-10.3:IL06 **Characterization and Modelling of Materials for Advanced Nuclear Systems**
G.R. LUMPKIN, K.R. WHITTLE, YINGJIE ZHANG, E.R. VANCE, Australian Nuclear Science and Technology Organisation, Menai, NSW, Australia

FF-10.3:L07 **Synthesis and Hydrothermal Stability of Ce-doped Zirconolite Ceramics**
P. PÖML[1,2], T. GEISLER[2], P. SCHMID-BEURMANN[2], U. GOLLA-SCHINDLER[2], J. HEIMINK[3], A. PUTNIS[2], [1]EC-JRC, Institut für Transurane, Karlsruhe, Germany; [2]Institut für Mineralogie, Westfälische Wilhelms-Universität, Münster, Germany; [3]Institut für Physikalische Chemie, Westfälische Wilhelms-Universität, Münster, Germany

FF-10.3:IL08 **Actuality and Future of Chinese Nuclear Fuel Cycle Management**
DAOGANG LU, School of Nuclear Science and Engineering, North China Electric Power University, Beijing, China

FF-10.3:IL09 **Modeling of Radiation Effects in Nuclear Waste Forms**
W.J. WEBER, Pacific Northwest National Laboratory, Richland, WA, USA

FF-10.3:IL10 **The Methodology of SCK.CEN to Evaluate the Long-term Performance in Geological Disposal Conditions of Immobilized High-level Radioactive Waste**
P. VAN ISEGHEM, K. LEMMENS, E. VALCKE et al, SCK.CEN, Mol, Belgium

Session FF-10.4
Design and Operation of Waste Immobilisation Facilities

FF-10.4:IL01 **Commercial-scale Immobilization of Nuclear Waste via Cold Crucible Melter**
C. VEYER, SGN, Saint Quentin en Yvelines, France

FF-10.4:IL02 **Meeting Nuclear Waste Treatment Challenges Through Proven and Newly Developed Technologies**
I. FRANSEN, Belgoprocess N.V., Dessel, Belgium

FF-10.4:IL03 **Studies on Helium Accumulation, Behaviour and Release from Nuclear Spent Fuel and Waste Forms**
T. WISS, J-P. HIERNAUT, E. MAUGERI, V.V. RONDINELLA, H. THIELE, J-Y. COLLE, R.J.M. KONINGS, European Commission, Joint Research Centre, Institute for Transuranium Elements, Karlsruhe, Germany

FF-10.4:IL04 **Using the Vitrification Test Rig for process Improvements on the Waste Vitrification Plants**
R. SHORT, N. GRIBBLE, E. TURNER, National Nuclear Laboratory, Sellafield, Seascale, Cumbria, UK; A. RILEY, Sellafield Ltd, Sellafield, Seascale, Cumbria, UK

FF-10.4:IL05 **Cold Crucible Inductive Melting Technology - Application to Vitrification and Ceramization of High Level and Actinide Wastes**
S.V. STEFANOVSKY, SIA Radon, Moscow, Russia

Session FF-10.5
Repository Design and Requirements

FF-10.5:IL01 **Likely Long-term Evolution of Deep Geological Repositories: Supporting Evidence from Natural and Archaeological Analogues**
W.R. ALEXANDER, Bedrock Geosciences, Auenstein, Switzerland

FF-10.5:IL02 **Lessons Learned from the Yucca Mountain and WIPP Projects**
E.J. BONANO, D.S. KESSEL, Sandia National Labs, Albuquerque, NM, USA

FF-10.5:IL03 **Uncertainty in Radionuclide Retention Processes for Crystalline Rock Repository Far-field**
G. BUCKAU, Karlsruhe Institute of Technology, Institute for Radioactive Waste Management, Eggenstein-Leopoldshafen, Germany

Poster Presentations

FF-10:P01 **Evaluation of Red Mud as a Raw Material in the Preparation of Glasses Used for Vitrification of Nuclear Wastes**
H. VIEIRA, J.R. MARTINELLI, Cidade Universitaria, Sao Paulo, Brazil

FF-10:P02 **Synthesis and Characterization of ZrO2 Based Pyrochlore-type Ceramics for Nuclear Waste Conditioning**
S. NEUMEIER, A.A. BUKAEMSKIY, G. MODOLO, D. BOSBACH, Forschungszentrum Jülich GmbH - IEF-6, Germany

FF-10:P03 **Conditioning of Actinides in Monazite-type Ceramics**
C. BABELOT, S. NEUMEIER, A.A. BUKAEMSKIY, G. MODOLO, D. BOSBACH, Forschungszentrum Jülich GmbH - IEF-6, Jülich, Germany

FF-10:P04 **New Silicates and Phosphates (Leucite-pollucite Crystal System) for Cs and LWR Cations Immobilizations**
A.I. ORLOVA, **E.E. LOGINOVA**, D.A. MIKHAILOV, A.N. TROSHIN, Nizhny Novgorod State University, Nizhny Novgorod, Russia

FF-10:P06 **Effect of Temperature on Glass Leach Kinetics**
ZHANG HUA, LUO SHANGGENG, China Institute of Atomic Energy, Beijing, China

SYMPOSIUM FG
PHOTOVOLTAIC SOLAR ENERGY CONVERSION: MATERIALS AND TECHNOLOGY CHALLENGES

Oral Presentations

Keynote Lecture

FG:KL **Sustainable Energy by Mesoscopic Solar Cells**
M. GRÄTZEL, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

Session FG-1
Crystalline Cells

FG-1:IL01 **Challenges for High Efficiency Amorphous/Crystalline (a-Si:H/c-Si) Silicon Heterojunction Solar Cells**
L. KORTE, T. SCHULZE, C. LEENDERTZ, R. STANGL, E. CONRAD, H. ANGERMANN, M. SCHMIDT, B. RECH, Helmholtz-Zentrum Berlin, Berlin, Germany

FG-1:IL02 **Advanced Material and Technological Concepts for Photovoltaic Solar Cells Based on Thin Silicon Wafers**
F. DROSS, I. GORDON, G. FLAMAND, J. JOHN, N. POSTHUMA, J. VAN HOEYMISSEN, E. VAN KERSCHAVER, J. POORTMANS, IMEC, Leuven, Belgium

FG-1:IL03 **Ultrapurification of Silicon for Photovoltaic Applications**
C. DEL CANIZO, A. LUQUE, Universidad Politecnica de Madrid, Madrid, Spain; A. RODRIGUEZ, G. OVEJERO, Univ. Complutense de Madrid, Spain

FG-1:L04 **Organolanthanide Down-shifters to Improve Si-based Solar Cell Efficiency**
A. LE DONNE, M. ACCIARRI, **S. BINETTI**, University of Milano-Bicocca, Dept. of Material Science, Milano, Italy

Session FG-2
Thin-film Photovoltaics

FG-2:IL01 **Materials Challenge of Polycrystalline Silicon Based Thin Film Solar Cells Prepared by High-rate Electron Beam Evaporation on ZnO Coated Glass Substrates**
B. RECH, T. SONTHEIMER, F. RUSKE, C. BECKER, M. WIMMER, B. RAU, S. GALL, Institute of Silicon Photovoltaics, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany

FG-2:IL02 **Thin Film Silicon Solar Cell with Advanced Light Trapping**
K. YAMAMOTO, M. ICHIKAWA, T. KUCHIYAMA, F. SEZAKI, K. YOSHIKAWA, T. MEGURO, Kaneka Corporation, Osaka, Japan

FG-2:L03 **Triple Silicon-carbon-nitride Alloy Films for Silicon Solar Cells**
T. STAPINSKI, B. SWATOWSKA, Dept. of Electronics, AGH University of Science and Technology, Krakow, Poland

FG-2:IL04 **Thin Film Full Spectrum Solar Cells with Low Concentration Ratios**
M. KONAGAI, Photovoltaics Research Center, Tokyo Institute of Technology, Tokyo, Japan

FG-2:IL05 **Crystalline Silicon Thin Films Solar Cells on Foreign Substrates: Potential and Challenges**
A. SLAOUI, Institut d'Electronique du Solide et des Systèmes (InESS) UMR 7163 CNRS - UdS, Strasbourg, France

FG-2:L06 **Broadband Absorption Enhancement Using Unique Nanostructures**
YALIN LU, Laser Optics Research Center, Dept. of Physics, United States Air Force Academy, Colorado Springs, CO, USA

FG-2:L07 **In-situ Internal Stress Measurements During Sputter Deposition of Metallic Oxide Thin Films for Photovoltaic Applications**
S. MICHOTTE, Q. VAN OVERMEERE, J. PROOST, Institute of Mechanics, Materials and Civil Engineering, Université Catholique de Louvain (UCL), Louvain-la-Neuve, Belgium

FG-2:IL08 **CdTe Thin Film Photovoltaics - Challenges in Materials Science**
W. JAEGERMANN, Surface Science Division, Institute of Materials Science, Darmstadt University of Technology, Darmstadt, Germany

FG-2:IL09 **Advances in Low Temperature Grown CdTe Solar Cells on Glass and Polymer Films**
S. BÜCHLER, J. PERRENOUD, B. SCHAFFNER, **A.N. TIWARI**, Lab. for Thin Films and Photovoltaics, EMPA, Dübendorf, Switzerland

FG-2:IL10 **Electrical Characterization of Thin Film CdTe Solar Cells**
Y. PROSKURYAKOV, K. DUROSE, Durham Centre for Renewable Energy, Physics Dept., University of Durham, Durham, UK

FG-2:L11 **Use of Combinatorial Methods to the Study of New Materials for Solar Cell Applications**
S. RONCALLO[1], O. KARIMI[1], J.M. GREGOIRE[2], D.W. LANE[1], K.D. ROGERS[3], [1]DASSR, Cranfield University, Swindon, Wiltshire, UK; [2]Cornell Fuel Cell Institute, Cornell University, Ithaca, New York, USA; [3]Cranfield Health, Cranfield University, Cranfield, Bedfordshire, UK

FG-2:IL12 **Material and Device Properties of High-Efficiency CIGS Solar Cells**
R. NOUFI, National Renewable Energy Laboratory, Golden, Colorado, USA

FG-2:IL13 **New Strategies for Chalcopyrites Based Solar Cells**
H.-W. SCHOCK, Helmholtz-Zentrum Berlin für Materialen und Energie, Berlin, Germany

FG-2:L14 **Thin Film Solar Cells From Nanocrystal Inks of Chalcogenide Semiconductors**
Q. GUO, G. FORD, M. KAR, H.W. HILLHOUSE, **R. AGRAWAL**, School of Chemical Engineering, Purdue University, West Lafayette, IN, USA

FG-2:L15 **Development of Hybrid Sputtering/Evaporation Process for Thin Film Cu(In,Ga)Se2 Solar Cells Grown**
S. MARCHIONNA, R. MONETA, Voltasolar s.r.l, Turate (CO), Italy; M. ACCIARRI, S. BINETTI, S. NOVAGLIA, L. MIGLIO, Material Science Dept., Milan-Bicocca University, Milan, Italy

Session FG-3
Emerging and New Generation Solar Cells

FG-3:IL01 **Applications of Metal Oxides in Organic Photovoltaics**
D.C. OLSON[1], J.M. ADAMSON[1, 2], K.X. STEIRER[1, 2], N.E. WIDJONARKO[1, 3], A. SIGDEL[1, 4], M.S. WHITE[1, 3], M.T. LLOYD[1], J.J. BERRY[1], D.S. GINLEY[1], [1]National Renewable Energy Laboratory, Golden, CO, USA; [2]Colorado School of Mines, Golden, CO, USA; [3]University of Colorado, Boulder, CO, USA; [4]University of Denver, Denver, CO, USA

FG-3:IL02 **Novel Photoactive Materials for Polymer Solar Cells**
S. LUZZATI, M. CATELLANI, E. KOZMA, D. KOTOWSKI, Istituto per lo Studio delle Macromolecole (ISMAC), CNR, Italy

FG-3:L03 **Vertical Stratification in P3HT:PCBM Organic Solar Cells**
P.C. DASTOOR, Centre for Organic Electronics, University of Newcastle, Callaghan, NSW, Australia

FG-3:L04 **The Influence of the Electron Acceptor on the Optical Constants of the Photoactive Layer of a Polymer Solar Cell**
P. MORVILLO, E. BOBEICO, S. ESPOSITO, ENEA, Portici (NA), Italy

FG-3:L05 **The Suitability of Organic Solar Cells for Different Indoor Conditions**
B. MINNAERT, P. VEELAERT, University College Ghent, Gent, Belgium

FG-3:IL06 **Development of Flexible Dye-sensitized Solar Cells**
T. MIYASAKA, Toin University of Yokohama, Graduate School of Engineering, Kanagawa, Japan

FG-3:IL07 **Mesoscopic Charge Transport in Dye-sensitized Solar Cells**
QING WANG, J.R. JENNINGS, G.W. YANG, Dept. of Materials Science and Engineering, National University of Singapore, Singapore

FG-3:IL08 **Tandem and Hybrid Structure for High Efficiency Dye-sensitized Solar Cells**
S. HAYASE, Graduate School of Life Science and Systems Eng., Kyushu Institute of Technology, Hitakyushu, Japan

FG-3:L09 **Near-IR Sensitization of Nanocrystalline TiO2 with New Ruthenium Complexes**
H. SUGIHARA, T. FUNAKI, N. ONOZAWA-KOMATSUZAKI, K. KASUGA, Y. KAWANISHI, K. SAYAMA, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

FG-3:L10 **DSSC Counterelectrodes Based on Nanocarbons**
S. GAGLIARDI, L. GIORGI, R. GIORGI, N. LISI, TH. DIKONIMOS MAKRIS, E. SALERNITANO, ENEA, C.R. Casaccia, Rome, Italy; E. DELL'ORTO, Material Science Dept., University Milano-Bicocca, Italy

FG-3:IL11 **Italian Road Map for Emerging and Next Generation PV**
F. ROCA, ENEA Portici Research Centre, Portici (NA), Italy

FG-3:L12 **Active Materials Based on Implanted Si for Obtaining Intermediate Band Solar Cells**
K. SANCHEZ, I. AGUILERA, P. PALACIOS, P. WAHNON, Instituto de Energia Solar & Dpt. Tecnologias Especiales Aplicadas a la Telecomunicacion, Universidad Politecnica de Madrid, Madrid, Spain

FG-3:L13 **Single-phase Intermediate Band Materials for PV Cells: Quantum Calculation Assessment and Experimental Realisation**
R. LUCENA, D. GAMARRA, **J.C. CONESA**, Inst. de Catálisis y Petroleoquímica, CSIC, Madrid, Spain; P. PALACIOS, I. AGUILERA, Y. SEMINOVSKI, P. WAHNÓN, Inst. de Energía Solar, Universidad Politécnica de Madrid, Spain

FG-3:L14 **Silicon Nano-Sponge Fabrication for 3rd Generation PV Cells**
K.-H. HEINIG, B. SCHMIDT, Research Center Dresden-Rossendorf, Dresden, Germany; K.-H. STEGEMANN, SignetSolar, Mochau, Germany

FG-3:L15 **Electrical Transport Mechanism for Silicon Quantum-dots Based Solar Cells**
M. MORGANO, A. SCACCABAROZZI, S. BINETTI, M. ACCIARRI, Dip. di Scienza dei Materiali, Università degli Studi Milano-Bicocca, Milano, Italy; ZHIZHONG YUAN, L. PAVESI, Lab. Nanoscienze, Dip. di Fisica, Università di Trento, Povo (Trento), Italy; G. PUCKER, Microtechnologies Laboratory, Fondazione Bruno Kessler, Povo (Trento), Italy

FG-3:L16 **Optimizing Quantum Dot Solar Concentrators with Thin Film Solar Cells**
W.G.J.H.M. VAN SARK, C. DE MELLO DONEGÁ, R.E.I. SCHROPP, Faculty of Science, Utrecht University, Utrecht, The Netherlands

FG-3:L17 **Cooperative Near-infrared Quantum Cutting in YVO4: Yb3+, Tm3+ Nanophosphors**
HUIJUAN ZHANG, YUHUA WANG, Dept. of Materials Science, School of Physical Science and Technology, Lanzhou University, Lanzhou, Gansu prov., China

FG-3:L18 **Thin-Film Si Solar Cells Using Back Reflector with Embedded Metal Nanoparticles**
R. LIANG, **R. SANTBERGEN**, M. ZEMAN, Delft University of Technology, Delft, The Netherlands

FG-3:L19 **GaAs-based Nanowire Arrays Grown by MOVPE on (111)Si Substrates for PV Applications**
P. PRETE, IMM-CNR, Lecce, Italy; I. MICCOLI, F. MARZO, N. LOVERGINE, Dept. of Innovation Engineering, University of Salento, Lecce, Italy

FG-3:L20 **Silicon Nanowires/P3HT Hybrid Thin Films for a New Generation of Efficient Solar Cells**
J. DAVENAS, A. RYBAK, Laboratoire des Matériaux Polymères & Biomatériaux, Université Claude Bernard - UMR CNRS 5223, Villeurbanne, France; D. CORNU, B. ARNAUD, Laboratoire des Multimatériaux & Interfaces, Université Claude Bernard - UMR CNRS 5615, Villeurbanne, France

FG-3:L21 **Metamorphic GaAsP/Si Materials for Spectrum-Optimized Si-based Multijunction Solar Cells**
S.A. RINGEL, T.J. GRASSMAN, The Ohio State University, Dept. of Electrical and Computer Engineering, Columbus, OH, USA

FG-3:IL22 **Intermediate Band Solar Cells**
A. MARTI, A. LUQUE, Instituto de Energia Solar, Universidad Politecnica de Madrid, ETSI Telecomunicacion, Madrid, Spain

FG-3:IL23 **Quantum Dot-sensitized Solar Cells and Ultrafast Carrier Dynamics Characterization**
T. TOYODA, QING SHEN, Dept. of Applied Physics and Chemistry, The University of Electro-Communications, Tokyo, Japan

FG-3:L24 **Efficient Energy Collection for High Efficiency Low-cost Solar Cells**
T. MARKVART, Solar Energy Lab., School of Engineering Sciences, University of Southampton, Southampton, UK

FG-3:L25 **Thin Film Luminescent Solar Concentrators**
S. CHANDRA[1], S.J. MCCORMACK[2], J. DORAN[1], A.J. CHATTEN[3], [1]Dublin Energy Lab., School of Physics, Dublin Institute of Technology, Dublin, Ireland; [2]School of Engineering, Trinity College Dublin, Dublin, Ireland; [3]Physics Dept., Imperial College, London, UK

FG-3:L26 **Indium Gallium Nitride on Silicon Solar Cell Grown by Plasma Assisted Molecular Beam Epitaxy**
LI-WEI TU, P.H. TSENG, W.C. YEN, Dept. of Physics and Center for Nano-science and Nanotechnology, National Sun Yat-Sen University, Kaohsiung, Taiwan, R.O.C.; S.W. FENG, Dept. of Applied Physics, National University of Kaohsiung, Kaohsiung, Taiwan, R.O.C.; C.W. LAN, C.H. CHEN, W.C. SUN, Photovoltaics Technology Center, Industrial Technology Research Inst., Hsin-Chu, Taiwan, R.O.C.

FG-3:L27 **Hybrid Structures Based on Nanostructured Inorganic and Organic Thin Films for Photovoltaic Applications**
S. ANTOHE, University of Bucharest, Faculty of Physics, Magurele, Ilfov, Romania; I. ENCULESCU, National Institute for Materials Physics, Magurele, Ilfov, Romania; L. ION, University of Bucharest, Faculty of Physics, Magurele, Ilfov, Romania

Session FG-4
PV Devices, Modules, Systems and Applications

FG-4:IL01 **Cost-reducing Technologies for Crystalline Silicon Solar Cells and Modules**
B. SOPORI, National Renewable Energy Laboratory, Golden, CO, USA

FG-4:IL02 **Recent Results of CIS-based Thin-film PV Technology Fabricated by "Sputtering and Sulfurization/Selenization"**
K. KUSHIYA, Showa Shell Sekiyu/Showa Shell Solar, Atsugi, Kanagawa, Japan

FG-4:IL03 **Fabrication and Processing of Polymer and Organic Solar Cells**
F.C. KREBS, Riso National Laboratory for Sustainable Energy, Roskilde, Denmark

FG-4:IL04 **New Design and Integration of High Efficiency Dye Sensitized Solar Cell (DSC) Module**
Y.D. ZHANG, X.M. HUANG, D.M. LI, Y.H. LUO, **Q.B. MENG**, Renewable Energy Laboratory, Institute of Physics, Chinese Academy of Sciences, Beijing, China

FG-4:IL05 **16.4% Open Aperture Module Efficiency Using Large mc-Si Metal-wrap-through Cells**
A.W. WEEBER, I.J. BENNETT, C. TJENGDRAWIRA, A.A. MEWE, M.W.P.E. LAMERS, I.G. ROMIJN, P.C. DE JONG, ECN Solar Energy, Petten, The Netherlands

FG-4:L06 **Design Analysis of a-Si/c-Si HIT Solar Cell**
M. NAWAZ, S. KARAZHANOV, A. HOLT, University Graduate Centre (UNIK) and Institute for Energy Technology, Kjeller, Norway

Poster Presentations

FG:P01 **Purification of Silicon for Terrestrial Solar Cell by Zone Melting EBM Using Metallurgical Silicon**
S.P. MOREIRA, A.D.S. CÔRTES, F.C. MARQUES, **P.R. MEI**, State University of Campinas, Campinas, SP, Brazil

FG:P02 **P and Al Diffusion Process for Thin Si Wafers Studied by SEM and EDX**
E. OCHOA-MARTINEZ, A. MERCHAN, R. ROMERO, M. GABAS, L. MARTINEZ., F. MARTIN, D. LEINEN, J.R. RAMOS-BARRADO, Lab. de Materiales y Superficie, Dpto de Fisica Aplicada, Universidad de Málaga, Spain

FG:P03 **Photovoltaic Cells Based on Chemically Deposited Tin Sulphide Thin Films**
A. AKKARI[1, 2], C. GUASCH[2], N. KAMOUN-TURKI[1], [1]Lab. de Physique de la Matière Condensée, Faculté des Sciences de Tunis El Manar, Tunis, Tunisie; [2]Institut d'Electronique du Sud, Unité Mixte de Recherche 5214 UM2-CNRS (ST2i) - Université Montpellier, Montpellier, France

FG:P04 **Surface Modification of Semiconductor Electrodes by Metalloporphyrine Ions: Enhancement of Band Edge Positions, Stability and Conversion Efficiency in PEC Processes**
H.S. HILAL, M. MASOUD, W. ATEERIH, S. SHAKHSHIR, H. SABRI, M. ATATREH, I. SAADEDDIN, A. ZYOUD, S. SALIH, M. EL-HASAN, An-Najah N. University, Nablus, Wets Bank, Palestine

FG:P05 **Quantum Size Effects in a-Si:H Films Prepared by PECVD with Different Hydrogen-diluted Silane**
L. PRUSÁKOVÁ, V. VAVRUNKOVÁ, M. NETRVALOVÁ, **P. SUTTA**, University of West Bohemia, New Technology Research Centre, Plzeò, Czech Republic; J. MULLEROVÁ, Dept. of Engineering Fundamentals, University of Zilina, Liptovský Mikulás, Slovakia

FG:P06 **Adhesion and Barrier Properties Analysis of Silica-like Thin Layer on Polyethylene Naphthalate Substrates for Thin Film Solar Cells**
M.L. ADDONIZIO, L. FUSCO, ENEA, Portici Research Center, Portici, Napoli, Italy

FG:P07 **Local Mapping of Electrical Properties and Durface Topography of CuInS2 Thin Films Seposited by Spray Pyrolysis on Conductive Layers**
N. KAMOUN ALLOUCHE[1, 2], N. JEBBARI[1], **C. GUASCH**[2], N. KAMOUN TURKI[1], M. CASTAGNE[2], [1]Lab. de Physique de la Matiere Condensee, Faculté des Sciences de Tunis El Manar, Tunisie; [2]Inst. d'Electronique du Sud, Unité Mixte de Recherche 5214 UM2-CNRS (ST2i), Univ. Montpellier 2, Montpellier, France

FG:P08 **Investigation of A2B6 Thin Films Solar Cells for Space Applications**
V. GHENESCU[1], L. ION[2], M. GHENESCU[1], M.I. RUSU[3], M. GUGIU[4], O. PORUMB[2], S. ANTOHE[2], [1]Institute of Space Sciences, Magurele-Ilfov, Romania; [2]University of Bucharest, Faculty of Physics, Magurele-Ilfov, Romania; [3]National Institute of R&D for Optoelectronics - INOE-2000, Magurele-Ilfov, Romania; [4]"Horia Hulubei" - National Inst. of Physics and Nuclear Engineering, Magurele-Ilfov, Romania

FG:P09 **Investigation of CIS Thin Films Deposited on Flexible Substrate Used for Photovoltaic Applications**
S. IFTIMIE[1], L. ION[1], , V. GHENESCU[2], M. GHENESCU[2], V. SOARE[3], M. BURADA[3], S. ANTOHE[1], [1]University of Bucharest, Faculty of Physics, Magurele-Ilfov, Romania; [2]Institute for Space Sciences, MG-23, Bucharest, Romania; [3]Institute for Nonferrous and Rare Metals, Bucharest, Romania

FG:P10 **Evaluation of Bi-layers Front Contacts in CdTe Solar Cells from Commercial Conducting Glass**
O. VIGIL-GALÁN, Escuela Superior de Física y Matemáticas, Inst. Politécnico Nacional, México D.F., México; M. BECERRIL, Dpto de Física, CINVESTAV-IPN, México D.F., México; R. MENDOZA-PÉREZ, J. FANDIÑO, Universidad Autónoma de la Ciudad de México, México D.F., México

FG:P11 **Electroless Deposition of the Single-phase CdTe Thin Film**
N. KLOCHKO, G. KHRYPUNOV, N. VOLKOVA, M. KHARCHENKO, V. KOPACH, National Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine

FG:P12 **Investigation of Thin Film CdS/CdTe Solar Cells with Different Back Contacts**
G. KHRYPUNOV, A. MERIUTS, N. KLOCHKO, T. SHELEST, A. KHRYPUNOVA, National Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine

FG:P13 **Nanofibrous TiO2: A new material with extraordinary properties**
M. ZUKALOVA, J. PROCHAZKA, L. KAVAN, J. Heyrovský Institute of Physical Chemistry, v.v.i. Academy of Sciences of the Czech Rep., Prague, Czech Rep.

FG:P14 **Band Structure in Amorphous Carbon Nitride Films and Its Application in Thin-Film Solar Cells**
M. AONO. N. TAMURA, Dept. of Materials Science and Engineering, National Defense Academy, Kanagawa, Japan; H. HABUCHI, Dept. of Electrical and Computer Engineering, Gifu National College of Technology, Gifu, Japan; N. KITAZAWA, **Y. WATANABE**, National Defense Academy, Kanagawa, Japan

FG:P15 **Electrochemical Fabrication of CIS Thin Film Solar Cell**
KYOUNGJU JANG, DAE MIN KIM, **JONG-YOUNG KIM**, HYO SIK CHANG, YOON SUK OH, Korea Inst. of Ceramic Eng. & Technology, Icheon, Korea

FG:P16 **Structural and Optical Properties of SiOxNy Containing Silicon Nanocrystals Fabricated by Plasma Enhanced Chemical Vapour Deposition Technique**
G. FERBLANTIER, M. CARRADA, F. DELACHAT, M. FICCADENTI, J.J. GROB, A. SLAOUI, InESS - CNRS, Strasbourg, France

FG:P17 **Comparing Organic Single-carrier-diodes to Bulk-hetero-junctions Using Impedance Spectroscopy**
B. ECKER, E. VON HAUFF, J. PARISI, Energy and Semiconductor Research, University of Oldenburg, Oldenburg, Germany

FG:P18 **Plasmonic Antennas for Extended Solar Energy Harvesting by Hybrid Solar Cells**
J. DAVENAS[1], A. RYBAK[1], D. CORNU[2], **F. VOCANSON**[3]; [1]Lab. des Matériaux Polymères & Biomatériaux, Université Claude Bernard Lyon 1, Villeurbanne, France; [2]Lab. des Multimatériaux & Interfaces, Université Claude Bernard - UMR CNRS 5615 ; Villeurbanne, France; [3]Lab. Hubert Curien, Université Jean Monnet - UMR CNRS 5516, Saint Etienne, France

FG:P19 **Relation Between FTO Film Properties and ZnO Nanowires Nucleation for Dye Sensitized Solar Cells**
G. REY, N. KARST, M. LABEAU, **D. BELLET**, Lab. des Matériaux et Génie Physique (LMGP) 3, Grenoble, France; C. TERNON, Lab. des Technologies de la Microélectronique (LTM), Grenoble, France

FG:P20 **Photovoltaic Cells Based on P3HT: PCBM (1:1) Polymer Blends**
C. BESLEAGA[1], S. IFTIMIE[1], A. MAJKIC[2], N. DINA[1], L. ION[1], M. RADU[1], A. TANASE[1], D. CRISAN[1], G. BRATINA[2], S. ANTOHE[1], [1]University of Bucharest, Faculty of Physics, Magurele-Ilfov, Romania; [2]University of Nova Gorica, Nova Gorica, Slovenia

FG:P21 **Hybrid Inorganic/Organic Photovoltaic Cells Based on CdTe Wire Arrays and ZnPc**
C. FLORICA[1], AL. NEMNES[1], L. ION[1], I. ENCULESCU[2], V. A. ANTOHE[1], A. RADU[1], G. CHISULESCU[1], S. ANTOHE[1], [1]Faculty of Physics, University of Bucharest, Magurele, Ilfov, Romania; [2]National Institute of Material Physics, Magurele, Ilfov, Romania

FG:P22 **Nanostructured ZnO Electrodes for Photovoltaic Applications**
I. ARGHIR[1], C. BESLEAGA[1], T.L. MITRAN[1], I. ENCULESCU[2], L. ION[1], S. ANTOHE[1], [1]Faculty of Physics, University of Bucharest, Magurele-Ilfov, Romania; [2]National Institute of Material Physics, Magurele, Ilfov, Romania

FG:P23 **Polymeric Additives and Surfactants Used for the Enhancement of Sprayed 3D Solar Cells Photovoltaic Respons**
I. POPOVICI, D. PERNIU, L. ISAC, A. DUTA, Transilvania University of Brasov, Brasov, Romania

FG:P24 **Optoelectronic Properties of Intermediate Band Derivatives of Clathrates for High Efficiency Solar Cells**
I. AGUILERA[1], P. PALACIOS[1], J.C. CONESA[2], P. WAHNON[1], [1]Instituto de Energia Solar & Dpto. Tecnologias Especiales Aplicadas a la Telecomunicacion, ETSI de Telecomunicacion, Universidad Politecnica de Madrid, Madrid, Spain; [2]Instituto de Catalisis y Petroleoquimica, CSIC, Cantoblanco, Madrid, Spain

FG:P25 **Surface Photovoltage Spectroscopy - A Powerful Tool for Evaluation of Electrodes Used in Dye-Sensitized Solar Cells**
TAO HE, National Center for Nanoscience and Technology, Beijing, China; J.Y. ZHAO, Y.A. CAO, College of Physics, and TEDA Applied Physics School, Nankai University, Tianjin, China

FG:P26 **Charge Transport and Recombination Studies of Multilayered Hybrid Photovoltaic Cells Based on Poly(3-octylthiophene) and Chemically Deposited CdS and Bi2S3**
H. CORTINA, E. PINEDA, J. CAMPOS, **HAILIN HU**, Centro de Investigación en Energía, UNAM, Temixco, Morelos, México; Ma.E. NICHO, Centro de Investigación en Ingeniería y Ciencias Aplicadas, UAEM, Cuernavaca, Morelos, México

FG:P27 **Silicon Nanowire-based Radial p-n Junction Solar Cells**
T. STELZNER, F. VOIGT, A. BERGER, D. LEROSE, V. SIVAKOV, B. HOFFMANN, S.H. CHRISTIANSEN, Institute of Photonic Technology, Jena, Germany

FG:P28 **Influence of the Al-BSF in the Efficiency of a Commercial Cz-Si Solar Cell**
C. VAZQUEZ[1], J. ALONSO[1], M.A. VAZQUEZ[1], L.A. CABALLERO[1], **J.R. RAMOS-BARRADO**[2], [1]Isofoton S.A., Málaga, Spain; [2]Lab. de Materiales y Superficie, Dpta. Fisica Aplicada I, Universidad de Malaga, Malaga, Spain

SYMPOSIUM FH

CONCENTRATING SOLAR TECHNOLOGIES: MATERIALS AND TECHNOLOGY SOLUTIONS FOR CPV AND CSP COMPETITIVENESS

Oral Presentations

Session FH-1

New Developments in Materials, and CPV Optics and Thermal Management

FH-1:IL01 **III-V Multijuncion Solar Cells for Ultra High Concentrations**
C. ALGORA, Instituto de Energía Solar-Universidad Politécnica de Madrid ETSI Telecomunicación, Madrid, Spain

FH-1:IL02 **Improved Concentration Capabilities of Flat-plate Fresnel Lenses**
M.Z. SHVARTS, Ioffe Physical Technical Institute, St. Petersburg, Russia; A.A. SOLUYANOV, Technoexan LTD, St. Petersburg, Russia

FH-1:L04 **Optical Methods for Indoor Characterization of Small Size Solar Concentrators**
A. PARRETTA, ENEA, Centro Ricerche "E. Clementel", Bologna (BO), Italy; A. ANTONINI, M.A. BUTTURI, P. DI BENEDETTO, D. UDERZO, P. ZURRU, CPower SRL, Ferrara (FE), Italy

FH-1:L05 **Assessment of a Phase Change Material System for Moderating Temperature Rise of Solar Cells Under Concentrated Sunlight**
E. CASENOVE, L. PUJOL, A. VOSSIER, A. PERONA, V. GOETZ, **A. DOLLET**, CNRS, PROMES Laboratory, Perpignan and Odeillo, France

Session FH-2

CPV Cell Components, Module Assembly and Testing

FH-2:IL01 **CPV Modules Based on Lens Panels**
V.D. RUMYANTSEV, Ioffe Physical-Technical Institute, St. Petersburg, Russia

FH-2:IL02 **Characterization of III-V Multi-junction Concentrator Cells and Systems**
G. SIEFER, G. PEHARZ F. DIMROTH A.W. BETT, Fraunhofer Institute for Solar Energy Systems, Freiburg, Germany

FH-2:IL03 **Modelling, Characterising and Optimising CPV Modules**
D. BUIE, R. HOFFMAN, Emcore Corporation, Albuquerque, NM, USA

FH-2:IL04 **Towards Accurate Reliability Tests for CPV Modules**
A.R. LAGUNAS, I. PETRINA, J. DIAZ, CENER, Sarriguren (Navarra), Spain

FH-2:IL05 **CPV Cell Assemblies and Module Qualification and Reliability Testing at Arima EcoEnergy**
CHIN-WEI HSU[1,2], A.Y.C. TZENG[1], **M.C.Y. HUANG**[1], C.C. LEE[2], [1]Arima EcoEnergy Technologies Corp., Taipei County, Taiwan; [2]Dept. of Optics and Photonics, National Central University, Taoyuan County, Taiwan

FH-2:L06 **Effects of High Concentration of Sunlight on Tunneling in Multi-Junction Solar Cells**
E.A. KATZ, A. BRAUN, B. HIRSCH, J.M. GORDON, Dept. of Solar Energy and Environmental Physics, Ben-Gurion University of the Negev, Sede Boqer, Israel; J. BLAUSTEIN, Institutes for Desert Research, Ben-Gurion University of the Negev, Sede Boqer, Israel; W. GUTER, A.W. BETT, Fraunhofer Institut für Solare Energiesysteme, Freiburg, Germany

FH-2:L07 **Solar Divergence Collimators for Collector Tests**
E. SANI, P. SANSONI, D. FONTANI, F. FRANCINI, L. MERCATELLI, D. JAFRANCESCO, CNR-INOA Istituto Nazionale di Ottica Applicata, Firenze, Italy

FH-2:IL08 **ENEA's Activities on C-PV Technology: Perspectives in Research, Development and Demonstration**
A. SARNO, G. GRADITI, C. CANCRO, R. FUCCI, F. ROCA, C. PRIVATO, ENEA, Portici (NA), Italy

FH-2:IL09 **Automatic Testing of CPV Cells**
E. RODRIGUEZ-MESSMER, Isofoton S.A., Malaga, Spain

FH-2:L10 **Improvements in the PhoCUS Technology: Realization of a Photovoltaic Concentrator Module Equipped with Multi-junction Solar Cells**
R. FUCCI, C. CANCRO, G. FLAMINIO, G. LEANZA, A. MEROLA, C. PRIVATO, A. SARNO, ENEA Research Center, Loc. Granatello, Portici (Naples), Italy

Session FH-3
CSP Concentrators and Heat Collection Elements

FH-3:IL01 **Materials and Design Requirements for Advanced Concentrators**
R. PITZ-PAAL, DLR, Institute of Technical Thermodynamics, Cologne, Germany

FH-3:IL02 **Solar Concentrators for Power Generation: Indian Experience**
N.D. KAUSHIKA, Bharati Vidyapeeth's College of Engineering, New Delhi, India

FH-3:IL03 **Advances in Reflector and Solar Selective Materials for Application to Concentrating Solar Power Systems**
C.E. KENNEDY, National Renewable Energy Laboratory, Golden, CO, USA

FH-3:L04 **Test Facility for Absorber Specimen of Solar Tower Power Plants**
B. HOFFSCHMIDT, K. GEIMER, J. GÖTTSCHE M. SCHMITZ, **M. SAUERBORN**, Solar-Institut Jülich, Jülich, Germany

FH-3:IL05 **New Materials in Solar Concentrators and Receivers**
W.J. PLATZER, A. HEIMSATH, C. HILDEBRANDT, Fraunhofer Institute for Solar Energy Systems, Freiburg, Germany

FH-3:IL06 **Advanced Materials and Joining Technologies for High Temperature Solar Receivers**
R. COUTURIER, P TOCHON, F. PRA, CEA-Grenoble, LITEN, Grenoble, France; M. VRINAT, A. FERRIERE, CNRS, PROMES Laboratory, Font Romeu Odeillo, France

FH-3:IL07 **High Temperature Stable Selective Absorber Coating for Receiver Tube**
K. SILMY, T. KUCKELKORN, J. SCHULTE-FISCHEDICK, SCHOTT Solar CSP GmbH, Bavaria, Germany

Session FH-4
Heat Thermal Fluids and Thermal Energy Storage

FH-4:IL01 **Molten Salt Heat Transfer Fluids and Thermal Storage Technology**
N. SIEGEL, Sandia National Laboratories, Albuquerque, NM, USA

FH-4:IL02 **PCM-Graphite Latent Heat Storage Systems for Industrial Process Heat Recovery**
R. SCHMITT, O. OETTINGER, T. GRUENBERGER, SGL CARBON GmbH, Meitingen, Germany; W.-D. STEINMANN, R. TAMME, Institute of Technical Thermodynamics, Stuttgart, Germany

FH-4:IL03 **New Methods to Characterize Phase Change Materials**
E. PALOMO DEL BARRIO, TREFLE - Site ENSAM, Talence, France

FH-4:L04 **Solar-thermal Energy Conversion and Storage: Conductive Heat Transfer Using Bulk Graphite for a Domestic System**
C.C. SORRELL, T.C. PALMER, L.J. BOWEN, A. NAKARUK, School of Materials Science and Engineering, University of New South Wales, Sydney, NSW, Australia

FH-4:L05 **Overview of PCMs for Concentrated Solar Power in the Temperature Range 200 to 350 °C**
T. BAUER, D. LAING, R. TAMME, Institute of Technical Thermodynamics, German Aerospace Center (DLR), Stuttgart, Germany

FH-4:IL06 **Thermochemical Energy Storage Systems**
A. HAUER, Bavarian Center for Applied Energy Research, ZAE Bayern, Garching, Germany

FH-4:IL07 **Thermal Energy Storage for Process Heat and Power Generation - Impact of Materials to Realise Efficient and Economic Storage Solutions**
R. TAMME, T. BAUER, C. MÜHLHAUSEN, F. SCHAUBE, D. LAING, DLR, German Aerospace Center, Institute of Technical Thermodynamics, Stuttgart, Germany

FH-4:IL08 **Overview of U.S. Thermal Energy Storage Research & Development for Concentrating Solar Power**
G.C. GLATZMAIER, National Renewable Energy Laboratory, Golden, CO, USA

FH-4:IL09 **Advanced Salts Mixtures as Heat Transfer Fluids**
F. FABRIZI, P. TARQUINI, M. VIGNOLINI, ENEA CR Casaccia, Rome, Italy

Session FH-5
Application and Commercial Experience

FH-5:IL01 **A Joule-cycle Ericsson Engine for Low Power Thermodynamic Solar Energy Conversion**
A. TOURÉ, F. LONTSI, M. ALAPHILIPPE, **P. STOUFFS**, LaTEP, IUT-GTE, Université de Pau et des Pays de l'Adour, Pau, France

FH-5:IL02 **Solar Thermochemical Production of Hydrogen and Other Fluids**
A. MEIER, Solar Technology Laboratory, Paul Scherrer Institute, Villigen PSI, Switzerland

FH-5:L03 **Optical and Thermal Characterization of Solar Receivers for Parabolic Trough Collectors**
M. SANCHEZ, E. MATEU, Solar Thermal Energy Dept., National Renewable Energy Centre (CENER), Sarriguren (Navarra), Spain; C. HERAS, R. ALONSO, Universidad Zaragoza, Dpto de Ingeniería Eléctrica y Comunicaciones, Zaragoza, Spain

FH-5:IL04 **A Review of CPV Technology and Commercial Progress**
A. SLADE, Siroc Pty. Ltd, Sydney, Australia

FH-5:IL05 **Building Integration Solutions for CPV**
D. CHEMISANA VILLEGAS, University of Lleida, Lleida, Spain

FH-5:IL06 **On-sun Performance of Flatcon® CPV Systems**
A. GOMBERT, I. HEILE, J. WÜLLNER, T. GERSTAIER, S. VAN RIESEN, E. GERSTER, M. RÖTTGER, Concentrix Solar GmbH, Freiburg, Germany

Poster Presentations

FH:P01 **Improvement of Radiation Resistance of Multijunction Solar Cells by Application of Bragg Reflectors**
V.M. LANTRATOV, V.V. EMELYANOV, N.A. KALYUZHNYY, S.A. MINTAIROV, M.Z. SHVARTS, Ioffe Physical Technical Institute of RAS,St.-Petersburg, Russia

FH:P02 **AlGaA/GaAs Photovoltaic Cells with InGaAs Quantum Dots**
S.A. BLOKHIN, **N.A. KALYUZHNYY**, A.V. SAKHAROV, A.M. NADTOCHIY, A.S. PAUYSOV, M.V. MAXIMOV, N.N. LEDENTSOV, V.M. LANTRATOV, S.A. MINTAIROV, M.Z. SHVARTS, Ioffe Physical Technical Institute RAS, St.Petersburg, Russia; A.R. KOVSH, S.S. MIKHRIN, Innolume GmbH, Dortmund, Germany

FH:P03 **Synthesis and Characterization of Transparent Luminescent ZnS:Mn/PMMA Nanocomposites for Down Converting Lenses**
A. MARTUCCI, M. DAI PRE', Università di Padova, Italy; J.A.S. BOMFIM, Centro Ricerche Plast-Optica, Amaro, Italy

FH:P04 **Crystalline Silicon PV Modules for Concentrator PV Systems**
N.I. KLYUI, A.V. MAKAROV, V.P. TEMCHENKO, Institute of Semiconductor Physics of NAS Ukraine, Kyiv, Ukraine

FH:P05 **TiSiC Nanostructured Thin Films as Solar Absorbers**
M. BRAIC, M. BALACEANU, C.N. ZOITA, V. BRAIC, National Institute for Optoelectronics, Magurele-Bucharest, Romania

SYMPOSIUM FI

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

Oral Presentations

Session FI-1
Fundamentals

FI-1:IL01 **Transparent Conductors: From Basic Principles to Controllable Properties**
J. MEDVEDEVA, Missouri S&T, Rolla, MO, USA

FI-1:IL02 **Fundamental Properties and Applications of Nb-doped Anatase TiO2 Transparent Conducting Thin Films**
T. HASEGAWA, University of Tokyo, Tokyo, Japan, Kanagawa Academy of Science and Technology (KAST), Kawasaki, Japan

FI-1:IL03 **Delafossite Mixed Oxides for p-type TCO Applications: Synthesis and Thermostructural Studies**
A. BARNABÉ, L. PRESMANES, M. LALANNE, E. MUGNIER, PH. TAILHADES, Université Paul Sabatier - CIRIMAT, Toulouse, France

FI-1:IL04 **Amorphous-In2O3 for Thin Film Transistor Applications**
D.C. PAINE, S. LEE, K. SCHWINK, H. PARK, Brown University, Providence, RI, USA

FI-1:IL05 **The Origin and Design of n-typness in ZnO and p-typness of Co,Ir and Rh Spinels Based on ZnO**
A. ZUNGER, National Renewable Energy Laboratory, Golden, CO, USA, Supported by USA DOE Basic Energy Science and in collaboration with S. Lany, H. Raebiger, T. Paudel

FI-1:IL06 **Infrared Spectroscopic Ellipsometry Characterisation of Free Carriers and Conduction Mechanisms in ZnO Thin Films**
B. ABENDROTH, G. GAERTNER, Freiberg University of Mining and Technology, Freiberg, Germany; S.H.N. LIM, M.M.M. BILEK, D.R. MCKENZIE, University of Sydney, Australia

FI-1:L07 **Heat-resistant Sb-doped SnO2 Transparent Conducting Films**
K. UEDA, Y. KISHIGAWA, Dept. of Materials Science, Kyushu Institute of Technology, Japan

FI-1:L08 **Intrinsic Defects of Transparent Conducting Oxides: A Comparative Hybrid-Functional Study of In_2O_3, SnO_2 and ZnO**
P. ÁGOSTON, A. KLEIN, K. ALBE, Institut für Materialwissenschaft, TU Darmstadt, Darmstadt, Germany; R.M. NIEMINEN, M.J. PUSKA, Dept. of Applied Physics, Helsinki University of Technology, Finland

FI-1:L09 **The Mechanism of Catalyzed Nanowire Growth**
M. KIRKHAM, ZHONG LIN WANG, **R.L. SNYDER**, MSE Georgia Institute of Technology, Atlanta, GA, USA

FI-1:IL10 **Amorphous In-Zn-O Films: Archetype for a New Class of TCO Materials?**
J.D. PERKINS, T. GENNETT, J.E. LEISCH, J.J. BERRY, D.S. GINLEY, National Renewable Energy Laboratory, Golden, CO, USA

FI-1:IL11 **Why Amorphous Oxide Semiconductors Have Superior Performances than Amorphous Silicon**
T. KAMIYA[1, 2], K. NOMURA[2], H. HOSONO[1,2], [1]Tokyo Institute of Technology, Yokohama, Japan, [2]JST, Yokohama, Japan

FI-1:IL12 **The Science and Technology Interface in Transparent Conducting Oxides**
T.J. MARKS, Dept. of Chemistry and the Materials Research Center, Northwestern University, Evanston, IL, USA

FI-1:IL13 **Raman Spectroscopy: A Tool for Understanding Bulk and Surface Properties of Nanocrystalline Oxides**
T. PAGNIER, LEPMI, Saint Martin d'Hères, France

FI-1:IL14 **Design of Shallow Acceptors in ZnO Through Early Transition Metals Co-doped with N Acceptors**
XIANGMEI DUAN, Dept. of Physics, Ningbo University, Ningbo, P.R. China

FI-1:IL15 **Doping and Transport in Zinc Oxide: New Developments**
K. ELLMER, Helmholtz-Zentrum für Materialen und Energie, Dept. Solar Fuels, Berlin, Germany

FI-1:IL16 **High Mobility Hydrogen-doped In2O3 Films for Si-based Solar Cell Application**
T. KOIDA, H. SAI, M. KONDO, Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan; K. TSUTSUMI, A. SAKAGUCHI, M. SUZUKI, J.A. Woolam Japan Corporation, Suginami, Japan; H. FUJIWARA, Center for Innovative Photovoltaic Center, Gifu University, Gifu, Japan

FI-1:L17 **Electrochemically Synthesized Titania Nanostructures: Investigation of Crystal Structure and Electronic Properties**
Q.A.S. NGUYEN, T.M. DEVINE, Dept. of Materials Science and Engineering, University of California, Berkeley, CA, USA

FI-1:L18 **DFT-based First-principle Calculation of Nb-doped anatase TiO2 and its Interactions with Oxygen Vacancies and Interstitial Oxygen**
H. KAMISAKA, T. HITOSUGI, T. SUENAGA, T. HASEGAWA, **K.YAMASHITA**, The University of Tokyo, Tokyo, Japan

Session FI-2
Materials Design and Device Development

FI-2:IL01 **Transparent Conductive Amorphous Oxides - Past, Present and Future**
E. FORTUNATO, G. GONÇALVES, P. BARQUINHA, L. PEREIRA, R. MARTINS, CENIMAT/I3N, FCT-UNL, Caparica, Portugal

FI-2:IL02 **Novel Spintronics Application of ZnO based DMS**
N. FUJIMURA, K. MASUKO, A. ASHIDA, T. YOSHIMURA, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka, Japan

FI-2:L03 **Non-oxide Wide-bandgap p-type Semiconductors BaCuChF (Ch = S, Se, Te)**
A. ZAKUTAYEV, R. KYKYNESHI, G. SCHNEIDER, J. TATE, Dept. of Physics, Oregon State University, OR, USA; H.A.S. PLATT, D.A. KESZLER, Dept. of Chemistry, Oregon State University, OR, USA; A. KLEIN, Surface Science Division, Institute of Materials Science, Darmstadt University of Technology, Darmstadt, Germany

FI-2:L04 **Unusual Dielectric and Conductive Behavior of ZnO Bicrystalline (000-1) Interfaces**
JONG-SOOK LEE, YONG KIM, EUI-CHOL SHIN, Chonnam National University, Gwangju, Korea; J. MAIER, Max Planck Institute for Solid State Research, Stuttgart, Germany

FI-2:L05 **Mechanism of Electrical Properties Degradation of ZnO:Al Films During Growth at Elevated Temperatures**
M. VINNICHENKO, R. GAGO*, S. CORNELIUS, A. ROGOZIN, N. SHEVCHENKO, A. KOLITSCH, W. MÖLLER, Institute of Ion-Beam Physics and Materials Research, Forschungszentrum Dresden-Rossendorf, Dresden, Germany; *Instituto de Ciencia de Materiales de Madrid, Madrid, Spain

FI-2:IL06 **Aqueous Processing for Oxide Electronics**
A. TELECKY, WEI WANG, KAI JIANG, S.T. MEYERS, **D.A. KESZLER**, Dept. of Chemistry, Oregon State University, Corvallis, OR, USA

FI-2:IL07 **TCO Nanoparticles: Properties and Electronic Devices**
R. SCHMECHEL, Faculty of Engineering, University Duisburg-Essen and CeNIDE, Duisburg, Germany

FI-2:L08 **Change of Electrical Properties of a-IGZO TFT Depending on Processing Parameters**
K.C. JO[1, 2], E.J. CHONG[1], J.S. LEE[1], S.Y. LEE[1], [1]Center for Energy Materials Research, Korea Institute of Science and Technology, Seoul, Republic of Korea; [2]Dept. of Electronics and Electrical Engineering, Korea University, Seoul, Republic of Korea

FI-2:L09 **Simultaneous Monitoring of Optical and Conductance Changes during the Redox Transformation of Transparent Conducting Layers**
C. VISY, P. S. TÓTH, E. PEINTLER-KRIVÁN, University of Szeged, Dept. of Physical Chemistry & Material Science, Szeged, Hungary

FI-2:L10 **Inkjet Printing of Transparent Electronics Based on Low Temperature Process of Ternary Metal Oxides**
A. OLZIERSKY[1], A. VILA[1], J.R. MORANTE[1, 2], [1]M-2E/XaRMAE/IN2UB, Dept. of Electronics, University of Barcelona, Barcelona, Spain; [2]IREC, Catalonia Institute for Energy Research, Barcelona, Spain

FI-2:IL11 **Amorphous Oxide Semiconductors for Thin-film Transistors**
H. KUMOMI, Canon Inc., Tokyo, Japan

FI-2:IL12 **Transparent Conductors on Polymer Films**
M. FAHLAND, T. VOGT, A. SCHÖNBERGER, Fraunhofer FEP, Dresden, Germany; U. PARTSCH, Fraunhofer IKTS, Dresden, Germany

FI-2:L13 **Emerging p-type Transparent Conductive Oxides: Theoretical and Experimental Studies**
M. MODREANU[1], M. NOLAN[1], E. CHIKOIDZE[2], B. SERVET[3], G. GARRY[3], G. HUYBERECHTS[4], [1]Tyndall National Institute, Cork, Ireland; [2]University of Versailles CNRS (GEMAC), Meudon, France; [3]Thales Research & Technology France, Palaiseau cedex, France; [4]Umicore Group R&D, Olen, Belgium

FI-2:L14 **Effects of Ag Doping on the Performance of ZnO-based Thin Film Transistor**
DEUK-HEE LEE, S.Y. LEE, Center for Energy Materials Research, Korea Institute of Science and Technology, Seoul, Republic of Korea; S. KIM, Dept. of Electrical Engineering and Institute for Nanoscience, Korea University, Seoul, Republic of Korea

FI-2:L15 **Simple Control of Threshold Voltage in Ag-doped ZnO Nanowire Field Effect Transistors**
KYOUNGWON KIM, P.C. DEBUNATH, D.-H. PARK, S.Y. LEE, Center for Energy Materials Research, Korea Institute of Science and Technology, Seoul, Korea.; S. KIM, Dept. of Electrical Engineering and Institute for Nano Science, Korea University, Seoul, Korea

FI-2:IL16 **Amorphous Transparent Conductors for Photovoltaic Application**
J.J. BERRY[1], A.K. SIGDEL[2], T. GENNETT[1], D.C. OLSON[1], D.S. GINLEY[1], J.D. PERKINS[1], [1]National Renewable Energy Laboratory, Golden CO, USA; [2]Dept. of Physics and Astronomy, University of Denver, Denver, CO, USA

FI-2:IL17 **Structure Controlled TCOs for Solar Cells Using Fast Growth Rate Atmospheric Pressure Chemical Vapour Deposition**
D.W. SHEEL, H.M. YATES, P. EVANS, University of Salford, Manchester, UK; U. DAGKALDIRAN, A. GORDIJN, F. FINGER, IEF5-Photovoltaik, Forschungszentrum Julich GmbH, Julich, Germany; C.BAILIFF, S. FAY, S.NICOLAY, EPFL, IMT, Neuchatel, Switzerland

FI-2:L18 **Phosphorus Doped ZnO, p-type and n-type, a Material for Photovoltaic and Other Applications**
HAO GONG, GUANGXIA HU, Dept. Mat. Sci. Eng., National University of Singapore, Singapore

FI-2:L19 **Tuning Color of p-type Wide Band Gap Semiconductor via Their Nanostructuration**
B. CHAVILLON, C. DOUSSIER-BROCHARD, R. SRINIVASAN, L. CARIO, L. LE PLEUX, Y. PELLEGRIN, E. BLART, F. ODOBEL, S. JOBIC, Institut des Matériaux Jean Rouxel, Nantes, France

FI-2:L20 **Conductive Self-cleaning Films Deposited by Aerosol Assisted Chemical Vapour Deposition**
M.G. NOLAN, J.A. HAMILTON, I.M. POVEY, M.E. PEMBLE, Tyndall National Institute, University College Cork, Cork, Ireland

FI-2:IL21 **Chromogenics for Sustainable Energy**
C.G. GRANQVIST, Uppsala University, The Angstrom Laboratory, Uppsala, Sweden

FI-2:IL22 **Pathways Towards p-type Oxide Layers for Optoelectronic Applications**
B. SZYSZKA[1], C. POLENZKY[1], P. LOEBMANN[2], S. GOETZENDORFER[2], C. ELSAESSER[3], W. KOERNER[3], [1]Fraunhofer Institute for Surface Engineering and Thin Films IST, Braunschweig, Germany; [2]Fraunhofer Institute for Silicate Research ISC, Wuerzburg, Germany; [3]Fraunhofer Institute Fraunhofer Institute for Mechanics of Materials IWM, Freiburg, Germany

FI-2:L23 **Au-based Transparent Conductors for Window Applications: Effect of Substrate Material and Temperature**
P.C. LANSAKER, G.A. NIKLASSON, C.G. GRANQVIST, Dept. of Engineering Sciences, The Angstrom Laboratory, Uppsala University, Uppsala, Sweden

FI-2:L24 **Fabrication of (001)-oriented Anatase Ti1-xNbxO2 Films on Glass Substrate with Perfectly Aligned LaAlO3 Seed Layer**
Y. HIROSE, K. KIMURA, K. TAIRA, S. NAKAO, T. HASEGAWA, Univ. of Tokyo, KAST, Tokyo, Japan

FI-2:L25 **The Relationship of Electrical and Structural Properties of Synthetic Melanin Embedded in Matrix of Thin Films Zinc Oxide, for Their Use as Electrodes in Bio-generators**
D.C. ALTAMIRANO-JUAREZ, J.J. HERNANDEZ-BARRIGA, Universidad de la Sierra Sur, Miahuatlán, Oaxaca, México; C. GARCÍA-PACHECO, Instituto Tecnológico de Chetumal, Chetumal, Quintana Roo, México

FI-2:IL26 **Electronic Structures and Energy Band Lineup of Transparent Conducting Materials Studied by Photoelectron Spectroscopy**
H. YANAGI, Univ. of Yamanashi, Kofu, Japan; K. NOMURA, H. HIRAMATSU, JST ERATO-SORST in Tokyo Tech, Yokohama, Japan; Y. TODA, T. KAMIYA, H. HOSONO, Tokyo Tech, Yokohama, Japan

FI-2:IL27 **Thermophysical Properties of Various TCO Films; ITO, IZO, AZO and TTO Films**
Y. SHIGESATO, N. OKA, T. YAGI, N. TAKETOSHI, T. BABA, Graduate School of Science and Eng., Aoyama Gakuin University, Sagamihara, Kanagawa, Japan National Institute of Advanced Industrial Science and Technology (AIST), Japan

FI-2:L28 **Electrical Transport in Al Doped ZnO Grown by Reactive Pulsed Magnetron Sputtering**
S. CORNELIUS, M. VINNICHENKO, A. KOLITSCH, W. MÖLLER, Institute of Ion Beam Physics and Materials Research, Forschungszentrum Dresden-Rossendorf, Dresden, Germany

FI-2:L29 **Morphological Control and Photochemical Properties of Nitrogen-doped Titania Nanoparticles by Microwave-assisted Solvothermal Process**
BIN LIU, YUHUA WANG, School of Physical Science and Technology, Lanzhou University, China; SHU YIN, TSUGIO SATO, IMRAM, Tohoku University, Japan

FI-2:L30 **Development of New Oxide Semiconductors for Thin-film Transistors Using Doping Methods**
WOO-SEOK CHEONG[1], JUN-YONG BAK[1, 2], HONG SEUNG KIM[2], SUNG MOOK CHUNG[1], CHI-SUN HWANG[1], [1]Transparent Display Team, ETRI, Daejeon, Korea; [2]Nanosemiconductor, Korea Maritime University, Korea

FI-2:IL31 **Chemical Modification of SnO2 as an Approach to Selectivity Enhancement for Gas Sensor Materials**
M. RUMYANTSEVA, Chemistry Dept., Moscow State University; A. GASKOV, Chemistry Dept., Moscow State University, Moscow, Russia

FI-2:L32 **Self-diffusion in TCO Materials: A Theoretical Approach**
P. ÁGOSTON, Inst. für Materialwissenschaft, TU Darmstadt, Darmstadt, Germany; P. ERHART, Lawrence Livermore National Lab., Livermore, CA, USA; **K. ALBE**, Inst. für Materialwissenschaft, TU Darmstadt, Darmstadt, Germany

FI-2:L33 **Opto-mechanical Properties of GZO Thin Films Deposited on Plastic Substrates at Room Temperature**
P. CARVALHO, E. SILVA, C. BATISTA, S. LANCEROS-MENDES, J. CARNEIRO, V. TEIXEIRA, Physics Dept., University of Minho, Guimaraes, Portugal

Session FI-3
Applications

FI-3:IL01 **Achieving Ultra Low Gas Sensing Utilizing Metal Oxides**
G. KIRIAKIDIS, K. MOSCHOVIS, I. KORTIDIS, Physics Dept., University of Crete and IESL/FORTH, Crete, Greece

FI-3:IL02 **High-performance and High-CRI OLEDs for Lighting and Their Fabrication Processes**
T. KOMODA, H. TSUJI, N. ITO, T. NISHIMORI, N. IDE, Panasonic Electric Works Co., Ltd., Kadoma, Osaka, Japan; T. IWAKUMA, Idemitsu Kosan Co., Ltd., Chiba, Japan; M. YAMAMOTO, Tazmo Co., Ltd., Okayama, Japan

FI-3:L03 **Controlled Threshold Voltage Shift of ZnO Nanowire Field Effect Transistors Depending on the Diameter of Nanowire**
D.-H. PARK, K. KIM, P.C. DEBNATH, S.Y. LEE, Center for Energy Materials Research, Korea Institute of Science and Technology, Seoul, Korea

FI-3:L04 **Bipolar Resistive Switching Behavior in Ti/MnO2/Pt Structure for Nonvolatile Resistive Switching**
M.K. YANG, **JEON-KOOK LEE**, Korea Institute of Science and Technology, Seoul, Korea; T.K. KO, Yonsei University, Seoul, Korea

FI-3:IL05 **Plasma Enhanced Deposition of Metal Oxide Films for Photovoltaics**
M.C.M. VAN DE SANDEN, Eindhoven University of Technology, Dept. of Applied Physics, Eindhoven, The Netherlands

FI-3:IL06 **Application of ZnO-based Transparent Electrodes to TFT-LCDs as Substitution for ITO**
T. YAMAMOTO, T. YAMADA, H. MAKINO, N. YAMAMOTO, Materials Design Center, Kochi University of Technology, Kamishi, Japan; Y. HIRASHIMA, H. IWAOKA, T. ITOH, A. UJIHARA, R&D Center, Geomatec Co., Ltd.; H. HOKARI, M. YOSHIDA, H. MORITA, Hachioji R&D Center, Casio Computer Co., Ltd., Japan

FI-3:L07 **Nanostructured Metal Oxides as Cathode Interfacial Layers for Hybrid-polymer Electronic Devices**
M. VASILOPOULOU[1], L.C. PALILIS[1], D.G. GEORGIADOU[1], P. ARGITIS[1], I. KOSTIS[2, 3], G. PAPADIMITROPOULOS[1], N.A. STATHOPOULOS[2], A. ILIADIS[3, 4], N. KONOFAOS[3], D. DAVAZOGLOU[1], [1]Institute of Microelectronics, NCSR Demokritos, Aghia Paraskevi, Greece; [2]Dept. of Electronics, Technological and Educational Institute of Pireaus, Aegaleo, Greece; [3]Dept. of Information and Communication Systems Eng., University of the Aegean, Karlovassi, Greece; [4]ECE Dept., University of Maryland, College Park, USA

FI-3:L08 **Photocatalytic Active Monoclinic WO3 Thin Films**
M. JOHANSSON, G. NIKLASSON, L. ÖSTERLUND, Dept. of Engineering Science, The Ångström Laboratory, Uppsala University, Uppsala, Sweden

FI-3:L09 **Surface Modification of ITO by Al2O3 for Electrodes in Polymer Based OLEDs**
A. WACHAU, T. BAYER, C. KÖRBER, A. KLEIN, Darmstadt University of Technology, Inst. of Materials Science, Surface Science Division, Darmstadt, Germany; K. STEGMAIER, C. MELZER, H. VON SEGGERN, Darmstadt University of Technology, Institute of Materials Science, Electronic Materials, Darmstadt, Germany; N. VILBRANDT, M. REHAN, Darmstadt University of Technology, Ernst-Berl-Institute für Technische und Makromolekulare Chemie, Darmstadt, Germany

FI-3:IL10 **3-Dimensional Nanostructured ZnO for Highly Efficient Thin Film Silicon Solar Cells**
M. VANECEK, A. PORUBA, Z. REMES, J. HOLOVSKY, A. PURKRT, O. BABCHENKO, K. HRUSKA, N. NEYKOVA, Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic; J. MEIER, U. KROLL, Oerlikon Solar-Lab SA, Neuchâtel, Switzerland

FI-3:IL11 **Low Voltage Driving Transparent Electroluminescence Devices Composed of Perovskite Oxides**
H. TAKASHIMA, NeRI, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

FI-3:IL12 **Recent Developments on Inorganic Electrochromic Systems**
A. ROUGIER[1], DAE HOON PARK[2], K. SAUVET[1, 3], L. SAUQUES[3], G. CAMPET[2], [1]Lab. de Réactivité et Chimie des Solides, UMR 6007, Amiens, France; [2]Inst. Chimie de la Matière Condensée de Bordeaux, UPR 9048, Pessac, France; [3]Délégation Générale de l'Armement, CEP, LOT A d'Arceuil, Arceuil, France

FI-3:IL13 **Optimisation of Thermochromic Thin Films on Glass; Design of Intelligent Windows**
R. BINIONS[1], M. SAELI[2], **I.P. PARKIN**[1], [1]University College London, Dept. of Chemistry, Christopher Ingold Labs, London, UK; [2]Università degli Studi di Palermo, Dip. di Progetto e Costruzione Edilizia (DPCE), Palermo, Italy

Poster Presentations

FI:P01 **Analysis on Resistive Switching of Resistive Random Access Memory using Visualization Technique of Data Storage Area with Secondary Electron Image**
K. KINOSHITA, T. MAKINO, A. HANADA, K. DOBASHI, T. YODA, S. KISHIDA, Tottori University, Tottori, Japan

FI:P02 **Interface Electronic Structure of Sputtering Deposited Undoped and Doped ZnO Thin Films on a Commercial Cz-Si Solar Cell Substrate**
M. GABÁS[1], P. DÍAZ[1], S. BIJANI[1], S. PALANCO[1], P. HERRERO[2], F. AGULLÓ-RUEDA[2], A.R. LANDA-CÁNOVAS[2], J.R. RAMOS-BARRADO[1], [1]Dpto. Física Aplicada I, Lab. de Materiales y Superficies, Universidad de Málaga, Málaga, Spain; [2]Inst. de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain

FI:P03 **Fabrication and Properties of Highly Oriented IZO/AZO Transparent Conducting Thin Films by the PLD Process**
JIN-HYUN SHIN, DONGKYUN SHIN, HEE YOUNG LEE, **JAI-YEOUL LEE**, Dept. of Materials Engineering, Yeungnam University, Gyongsan, Korea

FI:P04 **Electrical and Optical Properties of Boron-doped Anatase-type TiO2 Thin Films**
S. KUBO, Y. HARA, K. KADOWAKI, Y. OHNISHI, K. SATO, Y. YAMADA, T. YUKIOKA, H. KITAGAWA, Shimane University, Matsue, Shimane, Japan

FI:P05 **ZnO Microstructure Using Photonic-Crystal Structure by Polystyrene Micro-bead Template**
KUO-MING HUANG[1], HENG-JUI CHANG[1], CHUNG-HUNG WU[2], SHANG-FU CHEN[1], MENG-CHYI WU[1, 2], [1]Institute of Electronics Eng., National Tsing Hua University, Hsinchu, Taiwan; [2]Institute of Photonics Technologies, National Tsing Hua University, Hsinchu, Taiwan

FI:P06 **Electronic and Optical Properties of ZnO:M (Co, Cd)**
P. PALACIOS, I. AGUILERA, P. WAHNON, Instituto de Energía Solar & Dept. Tecnologías Especiales, ETSI, Telecomunicación, Universidad Politécnica de Madrid, Madrid, Spain

FI:P07 **Study of ZnO Films Growth with Different Doping Elements: Physical Properties and Their Comparison**
L. PRUSAKOVA, V. VAVRUNKOVA, M. NETRVALOVA, P. SUTTA, University of West Bohemia, New Technology Research Centre, Plzen, Czech Republic

FI:P08 **Study on the Electrical, Optical and Durability Characteristics of IZO/Ag-alloy/IZO Transparent Conductive Multilayer System**
S.H. CHO, **WON-JONG LEE**, Dept. of Materials Science and Engineering, KAIST, Taejon, Republic of Korea

FI:P09 **Structural, Morphological, Optical and Thermally Stimulated Current Studies of Transparent Conducting Oxides (ZnO:In)**
N. KAMOUN ALLOUCHE[1, 2], N. JEBBARI[1], C. GUASCH[2], N. KAMOUN TURKI[1], M. CASTAGNÉ[2], [1]Lab. Physique de la Matière Condensée, Fac. des Sciences de Tunis El Manar, Tunisie; [2]Inst. d'Electronique du Sud, Unité Mixte de Recherche 5214 UM2-CNRS (ST2i), Univ. Montpellier 2, Montpellier, France

FI:P10 **Sol Gel Synthesis of Doped ZnO Transparent Electrodes for PV Cells**
I. WINER, G.E. SHTER, **G.S. GRADER**, Technion-Israel Institute of Technology, Haifa, Israel

FI:P11 **Control of n-channel Depletion and Enhancement-mode ZnO Nanowire Field Effect Transistors**
P.C. DEBNATH[1, 2], K. KIM[1], D.-H. PARK[1], S.Y. LEE[1], [1]Center for Energy Materials Research, Korea Institute of Science and Technology (KIST), Seoul, South Korea; [2]University of Science and Technology (UST), South Korea

FI:P12 **Role of Conductive Buried Layer for the Performance Enhancement of a-IGZO TFT**
E. CHONG, KYOUNG-CHUL JO, SANG YEOL LEE, Center for Energy Materials Research, Korea Institute of Science and Technology, Seoul, Korea

FI:P13 **Potentiostatic Deposition of Zinc Oxide on Flexible Substrate**
C.H. WONG, C.L. MAK, K.H. WONG, Hong Kong Polytechnic University, Kowloon, Hong Kong

FI:P14 **High-transmittance and Stable Indium Gallium Zinc Oxide (IGZO) Films for UV Light-emitting Diodes**
HENG-JUI CHANG, KUO-MING HUANG, SHANG-FU CHEN, JUN-CHIEH HUANG, MENG-CHYI WU, Institute of Electronics Engineering, National Tsing Hua University, Hsinchu, Taiwan; CHUNG-HNUG WU, Institute of Photonics Technologies, National Tsing Hua University, Hsinchu, Taiwan

FI:P15 **Optical Hydrogen Response of Sputtered Pt/WO3 Nanostructured Films - Comparative Studies on Different Transparent Substrates**
M.H. YAACOB, J.Z. OU, K. KALANTAR-ZADEH, W. WLODARSKI, Sensor Technology Laboratory, School of Electrical and Computer Engineering, RMIT University, Melbourne, Australia

FI:P16 **Synthesis of Bi25FeO40/TiO2 Core-shell Structured Nano-composites and Their Photocatalytic Activity**
JIANMIN LI, JUYUE SONG, DONG HONG, SHENGWEN YU, DENGREN JIN, JINRONG CHENG, School of Materials Science and Engineering, Shanghai University, Shanghai, China

FI:P17 **Effect of Oxygen in Aerosol Assisted CVD of TiO2 Using Titanium Tetra-iso-propoxide/Acetylacetone Solutions**
F. MAURY, F.D. DUMINICA, CIRIMAT, CNRS/INPT/UPS, ENSIACET, Toulouse, France

SYMPOSIUM FJ

MATERIALS AND TECHNOLOGIES FOR SOLID STATE LIGHTING

Oral Presentations

Session FJ-1
Material Growth and Processing

FJ-1:IL01 **GaN Optoelectronics on Silicon**
A. DADGAR, Otto-von-Guericke-Universität Madeburg, FNW-IEP, Magdeburg, Germany

FJ-1:IL02 **Synthesis of Electroluminescent Organic and Organometallic Materials: Tuning Emission Colour by Molecular Design**
G.M. FARINOLA, Chemistry Department, University of Bari, Bari, Italy

FJ-1:IL03 **Zinc Oxide; Bulk Growth, Hydrogen and Schottky Diodes**
B.G. SVENSSON[1], R. SCHIFANO[1], K.M. JOHANSEN[1], L. VINES[1], V. QUEMENER[1], P. NEUVONEN[1], K.E. KNUTSEN[1], H.B. NORMANN[1], H. HAUG[1], M. KVALBEIN[1], A. GALECKAS[1], A.YU. KUZNETSOV[1], E.V. MONAKHOV[1], F. TUOMISTO[2], W. MTANGI[3], F.D. AURET[3], [1]Dept. of Physics/Center for Materials Science and Nanotechnology, University of Oslo, Blindern, Oslo, Norway; [2]Lab. of Physics, Helsinki University of Technology, TKK, Finland; [3]Dept. of Physics, University of Pretoria, Pretoria, South Africa

FJ-1:L04 **Catalyst-assisted MOVPE Self-assembly and Properties of Free-standing III-V Nanowires**
P. PRETE, IMM-CNR, Lecce, Italy; **N. LOVERGINE**, Dept. Innovation Engineering, University of Salento, Lecce, Italy

FJ-1:L05 **Growth of GaN Nanostructures by Halide Vapor Phase Epitaxy**
C. HEMMINGSSON, G. POZINA, B. MONEMAR, Dept. of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden

FJ-1:IL06 **InAs and GaN Quantum Dots: Similarities and Differences**
A. HOFFMANN, M. WINKELNKEMPER, C. KINDEL, S. WERNER, T. WARMING, G. HÖNIG, A. SCHLIEWA, D. BIMBERG, Technical University of Berlin, Institute of Solid State Physics, Berlin, Germany

FJ-1:IL07 **Combining GaN and ZnO in Single Heterostructures: Exploiting Their Relative Advantages**
J. ZUNIGA PEREZ, CRHEA (CNRS), Valbonne, France

FJ-1:L08 **High Ordered Thin Film of Oligothiophenes Grown by SuMBD: Optical, Electrical and Morphological Characterization**
T. TOCCOLI, M. TONEZZER, S. GOTTARDI, C. FASOLI, IFN-CNR, Povo di Trento, Italy; P. BETTOTTI, E. RIGO, L. PAVESI, Lab. Nanoscienze, Dip. di Fisica, Università di Trento, Povo di Trento, Italy; S. IANNOTTA, IMEM-CNR, Parco Area delle Scienze, Parma, Italy

FJ-1:L09 **InGaN Layers for Efficient Light Emission**
M. LESZCZYNSKI, P. PERLIN, R. CZERNECKI, P. PRYSTAWKO, G. TARGOWSKI, M. SARZYNSKI, J. PLESIEWICZ, T. SUSKI, S. POROWSKI, Institute of High Pressure Physics and TopGaN, Warsaw, Poland

FJ-1:L10 **Characterization of Polycrystalline SiC Layers Grown on n-type Si by LPCVD**
K. MAHMOOD, A. HASHMI, The Islamia University of Bahawalpur, Bahawalpur, Pakistan

FJ-1:IL11 **Heteroepitaxial Growth of *m*-plane InN on $LiAlO_2$ Substrates and Its Strong Anisotropic Optical Behaviors**
CHING-LIEN HSIAO[1], JR-TAI CHEN[1], HSU-CHENG HSU[1], KUEI-HSIEN CHEN[1,2], **LI-CHYONG CHEN**[1], [1]Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; [2]Institution of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan

FJ-1:IL12 **(Ga,Al,In)N Growth on Silicon**
A. KROST, Otto-von-Guericke-Universität Magdeburg, FNW-IEP, Magdeburg, Germany

FJ-1:IL13 **Recent Advances in the MOVPE Epitaxy of Indium Nitride**
O. BRIOT, S. RUFFENACH, M. MORET, B. GIL GES, CNRS UMR5650 CC074, Université Montpellier 2, Montpellier, France

FJ-1:L14 **AlN Technology for UV Light Emitting Devices**
Z. SITAR[1], P. LU[2], B. MOODY[2], R. SCHLESSER[2], R. COLLAZO[1], R. DALMAU[2], J. XIE[2], [1]Dept. of Materials Science and Engineering, North Carolina State University, Raleigh, NC, USA; [2]HexaTech, Inc., Morrisville, NC, USA

FJ-1:L15 **Growth and Characterization of Deep UV-range ZnMgSrO Thin Films Lattice-matched to ZnO Substrate**
NAE-SANG YOON, JANG-HO PARK, IL-SOO KIM, **BYUNG-TEAK LEE**, Photonic and Electronic Thin Film Lab., Dept. of Materials Science and Eng., Chonnam National University, Gwangju, Republic of Korea

Session FJ-2
Electro-optical Characterisation

FJ-2:IL01 **Relating Microstructure to Transport in n-type Organic Semiconductors**
A. SALLEO[1], J. RIVNAY[1], M.F. TONEY[2], A. FACCHETTI[3,4], T.J. MARKS[4], [1]Dept. of Materials Science and Eng., Stanford University, Stanford, CA, USA; [2]Stanford Synchrotron Radiation Lightsource, Menlo Park CA, USA; [3]Polyera Corp., Skokie IL, USA; [4]Dept. of Chemistry and Materials Research Center, Northwestern University, Evanston IL, USA

FJ-2:IL02 **Zinc Oxide a Material for Optoelectronic Applications: Analysis of Fundamental Properties and Their Modification by Hydrogen**
N.H. NICKEL, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany

FJ-2:L03 **New Phosphors for White Leds, the Case of Phosphate Doped with Divalent Europium and Other Luminescent Ions**
B. GLORIEUX[1], A. ORLOVA[2], A. GARCIA[1], A. KANUNNOV[2], V. JUBERA[1], [1]Institut de Chimie de la Matiere Condensée de Bordeaux, CNRS UPR 9048, Pessac, France; [2]State University of Nizhni Novgorod, Dept. of Chemistry, Nizhni Novgorod, Russia

FJ-2:L04 **Tunable Color and Luminescent Properties of Dy3+ and Tm3+ Co-activated CaZrO3 Phosphor**
YEZHOU LI, YUHUA WANG, Dept. of Materials Science, School of Physical Science and Technology, Lanzhou University, Lanzhou, Gansu Prov., P.R. China

FJ-2:IL05 **P-type Transparent Semiconductors: Synthesis and Applications**
J. TATE, A. ZAKUTAYEV, H. PLATT, D. KESZLER, Oregon State University, Corvallis, OR, USA; C. HEIN, T. MEYER, A. KLEIN, Darmstadt University of Technology, Germany

FJ-2:IL06 **Semiconductor Microcavities: An Overview of the Studies Made During the Passed 18 Years**
A. KAVOKIN, University of Rome II Tor Vergata, Rome, Italy, and Physics and Astronomy School, Univ. of Southampton, Highfield Southampton, UK

FJ-2:L07 **Origin of the Green Light Emission in Polyfluorene Based Diodes by Trap Investigations**
O. HAAS[1], J.C. SANCHEZ[1], C. RENAUD[1], P. LE RENDU[1], S.H. YANG[2], H.M. SHIH[2], **T.P. NGUYEN**[1], [1]Institut des Matériaux Jean Rouxel, CNRS- University of Nantes, Nantes, France; [2]Dept. of Applied Chemistry, National Chiao Tung University, Hsinchu, Taiwan, Republic of China

FJ-2:L08 **Red-emitting CaSrAl2SiO7:Eu3+ Phosphor for Near - Ultraviolet Light-emitting Diodes**
YUHUA WANG, H.Y. JIAO, Dept. of Materials Science, School of Physical Science and Technology, Lanzhou University, Lanzhou, P.R. China

FJ-2:IL09 **Interfacial Modifications in Organic Optoelectronic Devices**
J.W.P. HSU, Sandia National Laboratories, Albuquerque, NM, USA

FJ-2:IL10 **Defects and the Efficiency of GaN-based LEDs**
D. ZHU, C. MCALEESE, M.J. KAPPERS, **C.J. HUMPHREYS**, Dept. of Materials Science and Metallurgy, University of Cambridge, Cambridge, UK

FJ-2:L11 **Size-dependent Recombination Dynamics in ZnO Nanowires**
J.S. REPARAZ, M.R. WAGNER, A. HOFFMANN, Institut für Festkörperphysik, Technische Universität, Berlin, Germany; **F. GÜELL**, A. CORNET, J.R. MORANTE, M2E-MIND-IN2UB, Departament d'Electronica, Universitat de Barcelona, Barcelona, Catalunya, Spain

FJ-2:L12 **Hydrogen in InN: Ubiquitous Phenomena in Molecular Beam Epitaxy Grown Material**
V. DARAKCHIEVA[1,2], K. LORENZ[1], N.P. BARRADAS[1], E. ALVES[1], M.-Y. XIE[1,2], B. MONEMAR[2], [1]Instituto Tecnológico e Nuclear, Portugal; [2]IFM, Linköping University, Sweden; M. SCUBERT, University of Nebraska-Lincoln, USA; W.J. SCHAFF, Cornell University, USA; C.L. HSIAO, L.C. CHEN, National Taiwan University, Taiwan; L.W. TU, National Sun Yat-Sen University, Taiwan; T. YAMAGUCHI, Y. NANISHI, Retsumeikan University, Japan

FJ-2:IL13 **Organic Syntheses and Characteristics of Novel Conjugated Polymers for AMOLEDs**
HONSGUK SUH, YOUNGEUP JIN, SUHEE SONG, Dept. of Chemistry & Chemistry Inst. for Functional Materials, Pusan National University, Busan, Korea; SUN HEE KIM, SUNG HEUM PARK, KWANGHEE LEE, Dept. of Material Science and Eng., Gwangju Institute of Science and Technology, Korea

FJ-2:IL14 **Real Time Optical Monitoring of Growth and Processing of Materials for LEDs**
M. LOSURDO, G. BRUNO, CNR-IMIP, Bari, Italy

FJ-2:IL15 **VUV Optical Properties of III-Nitrides in the Thin Film Limit**
C. COBET, M. RÖPPISCHER, N. ESSER, Institute for Analytical Sciences, Berlin, Germany; R. GOLDHAHN, G. ROSSBACH, C. BUCHHEIM, Institute of Physics, TU Ilmenau, Ilmenau, Germany

Session FJ-3
Device Structures and Manufacturing

FJ-3:IL01 **White OLEDs for Lighting**
H. BOERNER, Philips Research Europe Laboratories, Aachen, Germany

FJ-3:IL02 **Opto-electronic Grade Zinc Oxide for Device Applications**
D.J. ROGERS, Ferechteh Hosseini Teherani Nanovation, Orsay, France

FJ-3:IL03 **Light Sources for General Lighting**
K. STREUBEL, Osram GmbH, Munich, Germany

FJ-3:IL04 **Nanostructured (In,Ga)N LEDs for Solid-State Lighting: Opportunities and Obstacles**
T.D. SANDS[1,2,3], I.H. WILDESON[1,3], D.A. EWOLDT[2,3], R. COLBY[2,3], ZHIWEN LIANG[2], D.N. ZAKHAROV[3], R.E. GARCIA[2], E.A. STACH[2,3], [1]School of Electrical and Computer Engineering, [2]School of Materials Engineering; [3]Birck Nanotechnology Center, Purdue University, West Lafayette, IN, USA

FJ-3:IL05 **ZnO Devices Fabrication Using Pulse Laser Deposition**
F.H. TEHERANI, D.J. ROGERS, Nanovation, Orsay, France

FJ-3:IL06 **Blue and White Phosphorescent Organic Light Emitting Devices**
JIANGENG XUE, Dept. of Materials Science and Engineering, University of Florida, Gainesville, FL, USA

FJ-3:IL07 **White Light Generation Using Microcavity Blue Phosphorescent OLEDs with Down-conversion Phosphors**
F. SO, University of Florida, Dept. Matls Science and Eng., Gainesville, FL,USA

FJ-3:IL08 **Surface Polarity Effects in the Optical and Electronic Properties of ZnO**
M.W. ALLEN, S.M. DURBIN, Dept. of Electrical and Computer Engineering, University of Canterbury, Christchurch, New Zealand

FJ-3:IL09 **Organic-inorganic Hybrid Field-effect Transistors**
T. ANTHOPOULOS, Dept. of Physics, Imperial College London, Blackett Laboratory, London, UK

Poster Presentations

FJ:P01 **Synthesis and Characterization of SrAl2O4 Based Persistent Phosphors by Modified Pechini Technique**
O. ARIKAN, C. KARAKAS, N. SOLAK, **S. AYDIN**, Istanbul Technical University, Dept. of Metallurgical & Materials Eng., Maslak, Istanbul, Turkey

FJ:P02 **First-principles Study of Frenkel Pair Defect Stability in Si (100) Surface**
S. FETAH[1, 4], A. DKHISSI[1], A. ESTÈVE[1], M. DJAFARI ROUHANI[1, 2], G. LANDA[1, 2], P. POCHET[3], [1]CNRS, LAAS, Toulouse, France; [2]Université de Toulouse, UPS, INSA, INP, ISAE, LAAS, Toulouse, France; [3]SP2M/L-Sim,CEA/Grenoble, Grenoble, France; [4]Université de Sétif UFAS, Faculté des Sciences, Dép. de Physique, Sétif, Algérie

FJ:P03 **The Enhanced Red Emission of YNbO4:Eu3+ for White LEDs Applications**
EUN YOUNG LEE, **YOUNG JIN KIM**, Dept. of Materials Science and Engineering, Kyonggi University, Suwon, Korea

FJ:P04 **Tailoring Optical Properties of Blue-gap Poly(p-phenylene vinylene)s for LEDs Applications**
M.M. GIANGREGORIO, M. LOSURDO, P. CAPEZZUTO, G. BRUNO, IMIP-CNR, Bari, Italy; **A. CARDONE**, C. MARTINELLI, G.M. FARINOLA, F. BABUDRI, F. NASO, Università di Bari, Dip. di Chimica, Bari and ICCOM-CNR, Bari, Italy

FJ:P05 **Interface and Surface Modification of ZnO Induced by Hydrogen and Nitrogen and Their Impact on Light Emission Properties**
M.M. GIANGREGORIO, G.V. BIANCO, A. SACCHETTI, P. CAPEZZUTO, M. LOSURDO, G. BRUNO, IMIP-CNR, Bari, Italy

FJ:P06 **Advanced Real Time Metrology of AlGaN/GaN and InGaN/GaN Epitaxy**
TONG-HO KIM, A.S. BROWN, Dept. of Electrical and Computer Engineering, Duke University, Durham, NC, USA; M.M. GIANGREGORIO, M. LOSURDO, G. BRUNO, IMIP-CNR, Bari, Italy

FJ:P07 **Organic Synthesis and Characteristics of Novel Conjugated Polymers with Cyano Group and Carbazole Unit for AMOLEDs**
SUHEE SONG[1], YOUNGEUP JIN[1], SUN HEE KIM[2], KWANGHEE LEE[2], HONSGUK SUH[1], [1]Dept. of Chemistry & Chemistry Institute for Functional Materials, Pusan National University, Busan, Korea; [2]Dept. of Material Science and Engineering, Gwangju Institute of Science and Technology, Korea

FJ:P08 **Dynamics of Donor Bound Excitons in Freestanding GaN Doped by Silicon and Oxygen**
G. POZINA, C. HEMMINGSSON, B. MONEMAR, Dept. of Physics, Chemistry and Biology, Linköping University, Linköping, Sweden

FJ:P09 **Structural and Optical Properties of Thick, Crack Free GaN Layers on Si(111) Grown by MOVPE**
S. FRITZE, A. DEMPEWOLF, F. BERTRAM, J. BLÄSING, T. HEMPEL, J. CHRISTEN, A. KROST, Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, Magdeburg, Germany; O. SCHULZ, AZZURRO Semiconductors AG, Magdeburg, Germany

FJ:P10 **Synthesis, Optical and Electrical Properties of Oligo(phenylene-vinylene)s Substituted with Electron-Accepting Sulfonyl Groups**
S. GLANG, V. SCHMITT, **H. DETERT**, Institute for Organic Chemistry, Johannes Gutenberg-Universität Mainz, Mainz, Germany

FJ:P11 **Mechanism for Enhanced Phonon-assisted Free Exciton Emission in ZnO Tetrapod Nanostructures**
S.L. CHEN[1], S.K. LEE[1], W.M. CHEN[1], H.X. DONG[2], Z.H. CHEN[2], **I.A. BUYANOVA**[1], [1]Dept. of Physics, Chemistry and Biology, Linköping Univeristy, Linköping, Sweden; [2]Surface Physics Laboratory, Dept. of Physics, Fudan University, Shanghai, China

FJ:P12 **Surface Barrier Diffusion**
J. ARBEY RODRIGUEZ[1], **M.G. MORENO-ARMENTA**[2], N. TAKEUCHI[2], [1]GEMA - Grupo de Estudio de Materiales, Dept. of Physics, Universidad Nacional de Colombia; [2]Centro de Nanociencias y Nanotecnología, Universidad Nacional Autónoma de México, Ensenada, BC, México

SYMPOSIUM FM
ELECTROMAGNETIC METAMATERIALS

Oral Presentations

Session FM-1
Microwave and THz Metamaterials

FM-1:IL01 **Terahertz Metamaterials: Artificial Materials for the Electromagnetic Void**
W.J. PADILLA, Boston College, Chestnut Hill, MA, USA

FM-1:IL02 **Terahertz Metamaterials Under a Near-field Microscope**
A. BITZER, A. ORTNER, **M. WALTHER**, Molecular and Optical Physics, University of Freiburg, Freiburg, Germany

FM-1:IL03 **New Concepts for Spoof Surface Plasmon Metamaterials**
S.A. MAIER, Physics Dept., Imperial College London, London, UK

FM-1:IL04 **Radar Absorbing Material Based on Metamaterials**
A.N. LAGARKOV, V.N. KISEL, V.N. SEMENENKO, ITAE RAS, Moscow, Russia

FM-1:L05 **Microwave Metamaterials Containing Magnetically Soft Microwires**
L.V. PANINA, School of Comp., Comm. and Electr., Univ. of Plymouth, Plymouth, UK; M. IPATOV, V. ZHUKOVA, **A. ZHUKOV**, Dpto. de Física de Materiales, Fac. Químicas, UPV/EHU San Sebastián, Spain

Session FM-2
Photonic and Infrared Metamaterials

FM-2:IL01 **Metamaterials: Going from Microwaves to Optics**
M. KAFESAKI, R. PENCIU, FORTH-IESL, Heraklion, Greece; Th. KOSCHNY, Iowa State University, USA; E.N. ECONOMOU, FORTH-IESL and University of Crete, Greece; C.M. SOUKOULIS, FORTH-IESL, Univ. of Crete, Greece, and Iowa State University, USA

FM-2:IL02 **Light Propagation in Optical Metamaterials**
F. LEDERER, T. PAUL, C. ROCKSTUHL, C. MENZEL, University of Jena, Institute of Condensed Matter Theory and Optics, Jena, Germany

FM-2:IL03 **Optics of Active Metamaterials**
A.K. SARYCHEV, Institute for Theoretical and Applied Electrodynamics, Moscow, Russia

FM-2:IL04 **Photonic Metamaterials: Recent Progress**
M. WEGENER, Institut für Angewandte Physik, Institut für Nanotechnologie, DFG-Center for Functional Nanostructures, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

FM-2:IL05 **Manufacturing Metamaterials Using Synchrotron Lithography**
H.O. MOSER, L.K. JIAN, S.P. HEUSSLER, S.M.P. KALAISELVI, S. VIRASAWMY, S.M. MANIAM, Singapore Synchrotron Light Source/National University of Singapore, Singapore

FM-2:L06 **Simple Effective Parameters Retrieval Employing Wave Propagation Phenomena**
A. ANDRYIEUSKI, R. MALUREANU, **A.V. LAVRINENKO**, Technical University of Denmark, Kgs. Lyngby, Denmark

FM-2:L07 **Full Scatter Characterization of Novel Photonic and Infrared Metamaterials**
T.M. FITZGERALD, M.A. MARCINIAK, Dept. of Engineering Physics, Air Force Institute of Technology, Wright-Patterson AFB, OH, USA

FM-2:L08 **Semiconductor-metal Nanoparticle Structure as Metamaterial with Negative Permeability at Optical Frequencies**
A.B. EVLYUKHIN, **C. REINHARDT**, A.I. KUZNETSOV, B.N. CHICHKOV, Laser Zentrum Hannover e.V., Hannover, Germany

Session FM-3
Nonlinear and Active Metamaterials

FM-3:IL01 **Nonlinear and Switchable Photonic Metamaterials**
N. ZHELUDEV, Optoelectronics Research Centre, University of Southampton, Southampton, UK

FM-3:IL02 **Nonlinear Photonics at the Nanoscale**
C. SIBILIA, Dip. di Energetica, Università di Roma La Sapienza, Rome, Italy

FM-3:L03 **Frequency-domain Simulations of a Negative-index Material with Embedded Gain**
Y. Sivan[1, 2], S. Xiao[1], U.K. Chettiar[1, 3], A.V. Kildishev[1], V.M. Shalaev[1], [1]School of Electrical and Computer Eng., Purdue University, West Lafayette, IN, USA; [2]Imperial College London, Blackett Lab., London, UK; [3]Electrical and Systems Eng.g, University of Pennsylvania, Philadelphia, PA, USA

FM-3:IL04 **Nonlinear and Tunable Composite Metamaterials**
Y.S. KIVSHAR, Nonlinear Physics Centre, Research School of Physics and Eng., Australian National University, Canberra, ACT, Australia

FM-3:IL05 **Nonlinear Microwave Metasurfaces and Metamaterials**
A.G. SCHUCHINSKY, Queen's University Belfast, Belfast, UK

FM-3:L06 **Intrinsic Localization in Nonlinear Dissipative Metamaterials**
N. LAZARIDES, G.P. TSIRONIS, Dept. of Physics, University of Crete, Heraklion, Greece

Session FM-4
Antenna and Waveguide Applications

FM-4:IL01 **Fundamentals and Applications of Transmission-line Metamaterials**
G.V. ELEFTHERIADES, University of Toronto, Dept. of Electrical and Computer Engineering, Toronto, ON, Canada

FM-4:IL02 **On the Way to Improved Plasmonic Structures**
A. BOLTASSEVA[1, 2], R.B. NIELSEN[1], G. NAIK[2], P. WEST[2], N. EMANI[2], V. SHALAEV[2], [1]DTU Fotonik, Technical University of Denmark, Kgs Lyngby, Denmark; [2]Birck Nanotechnolocy Center, Purdue University, West Lafayette, IN, USA

FM-4:IL03 **Application of Low-frequency Metamaterial Lenses to Magnetic Resonance Imaging and Other Medical Applications**
R. MARQUÉS, M.J. FREIRE, L. JELINEK, Universidad de Sevilla, Fac. de Fisica, Sevilla, Spain

FM-4:L04 **Highly Directional Double-negative Plasmonic Nanoantenna for Blue Light: Gain Assistance with Surface Plasmon Resonance**
M. RAJPUT, R.K. SINHA, TIFAC-Centre of Relevance and Excellence in Fiber Optics and Optical Communication, Dept. of Applied Physics, Delhi College of Eng., University of Delhi, Delhi, India

Session FM-5
Cloaking and Transformation Optics with Metamaterials

FM-5:IL01 **New Concepts of Microwave and Optical Cloaking**
S. TRETYAKOV, Helsinki University of Technology, Espoo, Finland

FM-5:IL02 **Elastodynamic Metamaterials**
M. BRIANE, IRMAR and INSA de Rennes, France; F. GUEVARA VASQUEZ, **G.W. MILTON**, D. ONOFREI, University of Utah, Salt Lake City, UT, USA; J. WILLIS, Cambridge University, UK

FM-5:IL03 **Selected Applications of Transformation Electromagnetics**
I. GALLINA, G. CASTALDI, **V. GALDI**, University of Sannio, Benevento, Italy; A. ALU', University of Texas, Austin, TX, USA; N. ENGHETA, University of Pennsylvania, Philadelphia, PA, USA

FM-5:L04 **Applications of Metamaterial Cloaking**
F. BILOTTI, S. TRICARICO, L. VEGNI, University "Roma Tre", Dept. of Applied Electronics, Rome, Italy

FM-5:IL05 **Anisotropic Metamaterials Emulated by Tapered Waveguides**
I.I. SMOLYANINOV, BAE Systems, Columbia, MD, USA

FM-5:IL06 **Transforming Light with Metamaterials**
V.M. SHALAEV, A.V. KILDISHEV, S. XIAO, V.P. DRACHEV, A. BOLTASSEVA, School of Electrical and Computer Engineering and Birck Nanotechnology Center, Purdue University, West Lafayette, IN, USA

FM-5:IL07 **Non-Euclidean Transformation Optics**
U. LEONHARDT, University of St Andrews, St Andrews, UK

Session FM-6
Superlenses and Near-field Imaging

FM-6:IL01 **Optical Fano Resonance in Nanostructures with Broken Symmetry**
B.S. LUK'YANCHUK, T.C. CHONG, L.P. SHI, Data Storage Institute, Agency for Research, Science and Technology, Singapore

FM-6:L02 **Novel Microscopy Techniques Based on Simulated Metamaterial Anisotropy**
V.N. SMOLYANINOVA, Towson University, Towson, MD, USA; I.I. SMOLYANINOV, University of Maryland, USA; A.V. KILDISHEV, V.M. SHALAEV, Purdue University, USA

FM-6:IL03 **Metamaterials, High-frequency Magnetism and the Landau-Lifshitz Permeability Argument**
R. MERLIN, University of Michigan, Dept. of Physics, Ann Arbor, MI, USA

FM-6:IL04 **Manipulation of Near Fields by Means of Metamaterials**
P.A. BELOV[1], G. PALIKARAS[1], M.G. SILVEIRINHA[2], YAN ZHAO[1], R. DUBROVKA[1], C.R. SIMOVSKI[3], YANG HAO[1], C. PARINI[1], [1]Queen Mary University of London, London, UK; [2]University of Coimbra, Portugal; [3]Helsinki University of Technology, Finland

FM-6:IL05 **Superresolution Through Superoscillations**
E.T.F. ROGERS, T.S. KAO, University of Southampton, Southampton, UK; J. BAUMGARTL, M. MAZILU, S. KOSMEIER, K. DHOLAKIA, University of St Andrews, St Andrews, UK; N.I. ZHELUDEV, University of Southampton, Southampton, UK

Session FM-7
Novel Concepts in Metamaterials

FM-7:IL01 **Gyroelectric Nonlinear Control in Complex Metamaterial Structures**
A.D. BOARDMAN, P. EGAN, R.C. MITCHELL-THOMAS, Y.G. RAPOPORT, University of Salford, Joule Physics Laboratory, Greater Manchester, UK

FM-7:IL02 **Electromagnetic Metamaterials and Computational Electromagnetics**
TIE JUN CUI, State Key Laboratory of Millimeter Waves, School of Information Science and Eng., Southeast University, Nanjing, P.R. China

FM-7:IL03 **Magnetophotonic Crystals**
F.P. VINOGRADOV, Institute for Theoretical and Applied Electromagnetics, RAS, Moscow, Russia

FM-7:IL04 **Trapped Rainbow Storage of Light in Metamaterials**
O. HESS, Advanced Technology Institute and Dept. of Physics, FEPS, University of Surrey, Guildford, Surrey, UK

FM-7:L05 **Laser-induce Transfer - A Novel Approach for Fabrication of Nanoparticle Structures for Plamonics and Metamaterial Applications**
A.I. KUZNETSOV, C. REINHARDT, W. CHENG, A.B. EVLYUKHIN, B.N. CHICHKOV, Laser Zentrum Hannover e.V., Hannover, Germany

FM-7:L06 **Novel Ways to Observe the Handedness of Chiral Optical Metamaterials**
V.K. VALEV, T. VERBIEST, Molecular Electronics and Photonics, INPAC, K.U. Leuven, Leuven, Belgium; A.V. SILHANEK, W. GILLIJNS, V.V. MOSHCHALKOV, Superconductivity and Magnetism & Pulsed Fields Group, INPAC, K.U. Leuven, Leuven, Belgium; N. SMISDOM, B. DE CLERCQ, M. AMELOOT, University Hasselt and Transnational University Limburg, BIOMED, Diepenbeek, Belgium

Poster Presentations

FM:P01 **Electron-beam Lithographed Metamaterial Devices Operating in the Terahertz Region**
N. CHICKI[1], E. DI GENNARO[1], E. ESPOSITO[2], A. ANDREONE[1], [1]CNR-INFM Coherentia and Dept. of Physics, University of Naples Federico II, Naples, Italy; [2]CNR-IC Institute of Cibernetics, Pozzuoli (Na), Naples, Italy

FM:P02 **Design of Chiral Media by Two Dimensions Periodical Structures of Metallic Cranks**
G.J. MOLINA-CUBEROS, J. MARGINEDA, M.J. NUNEZ, E. MARTIN, University of Murcia, Murcia, Spain; A.J. GARCIA-COLLADO, Universidad Catolica S. Antonio, Murcia, Spain

FM:P03 **Second Harmonic Generation from Planar Gold Nanostructures**
V.K. VALEV, T. VERBIEST, **A.V. SILHANEK**, W. GILLIJNS, V.V. MOSHCHALKOV, N. SMISDOM, B. DE CLERCQ, M. AMELOOT, Katholieke Universiteit Leuven, Leuven, Belgium

FK - 6th International Conference
SCIENCE AND ENGINEERING OF NOVEL SUPERCONDUCTORS

Oral Presentations

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

FK-1:IL01 **Insight in High-temperature Superconductivity from Cuprate Heterostructures**
I. BOZOVIC, Brookhaven National Laboratory, Upton, NY, USA

FK-1:IL02 **Electric Field Induced Superconductivity**
Y. IWASA, Institute for Materials Research, Tohoku University, Sendai, Japan

FK-1:IL03 **Structure and Electrical Properties of the Interface Between LaAlO3 and SrTiO3**
A. KALABUKHOV, R. GUNNARSSON, D. WINKLER, T. CLAESON, J. BÖRJESSON, N. LJUSTINA, E. OLSSON, Chalmers University of Technology, Göteborg, Sweden; Y. BOIKOV, I. SERENKOV, V. SAKHAROV, Ioffe Physico-Technical Institute, St Petersburg, Russian Federation; V. POPOK, University of Gothenburg, Göteborg, Sweden

FK-1:L04 **Synthesis, Structural and Physical Properties of Substituted Eu2Ru2-xIrxO7**
T.E. SUTTO, T. WONG, J. TAFT, T. DUNCAN, M. OSOFSKY, **D. GUBSER**, Naval Research Laboratory, Material Science and Eng. Division, Washington, DC, USA

FK-1:L05 **Homogeneity and Connectivity of Doped Mgb2 Bulks and Strands as Probed by Heat Capacity, SEM, and Current Transport**
M.D. SUMPTION , M.A. SUSNER , Y. YANG, E.W. COLLINGS, LASM, Dept. of Materials Science and Engineering, The Ohio State University, Columbus, OH, USA

FK-1:L06 **YBCO and YbBCO Thin Films and Multilayeres Grown by MOCVD**
A.V. MARKELOV, A.A. ZAKHAROV, S.V. SAMOYLENKOV, A.R. KAUL, Lomonosov Moscow State University, Dept. of Materials Science, Moscow, Russia

Session FK-2
Pnictides

FK-2:IL01 **Iron-based Superconducting Materials: Current Status**
H. HOSONO, Tokyo Institute of Technology, Yokohama, Japan

FK-2:IL02 **Point-contact Andreev-reflection Spectroscopy and Electron-boson Coupling in Superconducting Pnictides**
R.S. GONNELLI, D. DAGHERO, M. TORTELLO, G.A. UMMARINO, Dip. di Fisica and CNISM, Politecnico di Torino, Torino, Italy; V.A. STEPANOV, P.N. Lebedev Physical Inst., RAS, Moscow, Russia; R.K. KREMER, Max-Planck Inst. for Solid-State Research, Stuttgart, Germany; J. KARPINSKI, N.D. ZHIGADLO, Lab. for Solid-State Physics, ETH, Zurich, Switzerland; JIANYI JIANG, Appl. Superc. Center, National High Magnetic Field Lab., Tallahassee, USA

FK-2:IL03 **NMR Studies of the New Iron Pnictide Superconductors**
H.-J. GRAFE, G. LANG, F. HAMMERATH, D. PAAR, K. MANTHEY, G. BEHR, J. WERNER, B. BÜCHNER, IFW Dresden, Institute for Solid State Research, Dresden, Germany

FK-2:L04 **Iron Pnictide Thin Film Hybrid Josephson Junctions**
P. SEIDEL[1], F. SCHMIDL[1], S. DÖRING[1], M. KIDSZUN[2], S. HAINDL[2], L. SCHULTZ[2], B. HOLZAPFEL[2], [1]Friedrich-Schiller-Universität Jena, Institut für Festkörperphysik, Jena, Germany; [2]IFW Dresden, Institute for Metallic Materials, Dresden, Germany

FK-2:IL05 **Fe Based Superconductors: Superconducting Properties Relevant for Applications**
M. PUTTI, I. PALLECCHI, E. BELLINGERI, M.R. CIMBERLE, M. TROPEANO, C. FERDEGHINI, P. MANFRINETTI, M. PANI, A. PALENZONA, CNR-INFM-LAMIA and Università di Genova, Genoa, Italy; C. TARANTINI, A. YAMAMOTO, J. JIANG, J. JAROSZYNSKI, F. KAMETANI, D. ABRAIMOV, A. POLYANSKII, J.D. WEISS, E.E. HELLSTROM, A. GUREVICH, D.C. LARBALESTIER, Applied Superconductivity Center, National High Magnetic Field Lab., Florida State University, FL, USA

FK-2:IL06 **Iron Pnictide Superconductors with Perovskite-type Blocking Layers**
H. OGINO, K. KISHIO, J. SHIMOYAMA, Dept. of Applied Chemistry, The University of Tokyo, Tokyo, Japan

FK-2:IL07 **Point Contact Andreev Reflection of the Iron Based Superconductors**
K.A. YATES, K. MORRISON, ITM USMAN, J.D. MOORE, A.D. CAPLIN, L.F. COHEN, The Blackett Laboratory, Physics Dept., Imperial College London, London, UK

FK-2:L09 **On the Microscopic Magnetic Properties of Superconducting SmFeAsO0.8F0.2**
G. PRANDO, Dip. di Fisica "E. Amaldi", Università di Roma Tre, Roma, Italy and CNISM, u.d.r. di Pavia and Dip. di Fisica "A. Volta", Università di Pavia, Pavia, Italy; P. CARRETTA, A. LASCIALFARI, A. RIGAMONTI, S. SANNA, Dip. di Fisica "A. Volta", Università di Pavia, Pavia, Italy; L. ROMANO', Dip. di Fisica and Unità CNISM, Università di Parma, Parma, Italy; A. PALENZONA, M. PUTTI, M. TROPEANO, Dip. di Fisica, Università di Genova, Genova, Italy and CNR/INFM-LAMIA, Genova, Italy

FK-2:L10 **Universal Normal State Susceptibility in Iron Pnictides**
R. KLINGELER, N. LEPS, U. STOCKERT, C. HESS, V. KATAEV, H.-J. GRAFE, F. HAMMERATH, G. LANG, G. BEHR, L. HARNAGEA, S. SINGH, B. BÜCHNER, Inst. for Solid State Research, IFW Dresden, Dresden, Germany

FK-2:L11 **Fabrication of Fe-Te-S Superconducting Epitaxial Thin Films by Pulsed Laser Deposition**
P. MELE, **K. MATSUMOTO**, Y. HARUYAMA, Kyushu Institute of Technology, Kitakyushu, Japan and TRIP-JST, Tsukuba, Japan; M. MUKAIDA, T. KISS, Kyushu University, Fukuoka, Japan and TRIP-JST, Tsukuba, Japan; Y. YOSHIDA, Y. ICHINO, Nagoya University, Japan and TRIP-JST, Tuskuba, Japan

Session FK-3
Properties of Superconductors

FK-3:IL01 **New Trends in the Physics of Heavy Fermion Superconductors**
L. HOWALD, V. TAUFOUR, E. HASSINGER, D. AOKI, T. MATSUDA, G. KNEBEL, G. LAPERTOT, J. FLOUQUET, **J.P. BRISON**, CEA-INAC-SPSMS, Grenoble, France

FK-3:IL02 **Evolution of Superconductive Properties and Texture with Heat Treatment Time in Carbon-Doped In-situ Processed MgB_2 Strands**
E.W. COLLINGS, M.A. SUSNER, T.W. DANIELS, M.D. SUMPTION, The Ohio State University, Columbus, OH, USA

FK-3:IL03 **Terahertz Spectroscopy of Novel Superconductors and in Strongly Correlated Materials**
S. LUPI, P. CALVANI, O. LIMAJ, D. NICOLETTI, Dept. of Physics, University of Rome La Sapienza, Rome, Italy; M. ORTOLANI, IFN-CNR, Rome, Italy; A. PERUCCHI, ELETTRA - Sincrotrone Trieste S.C.p.A., Basovizza, Trieste, Italy

FK-3:IL04 **Superconductors-ferromagnet Nanostructures**
A. BUZDIN, Condensed Matter Theory Group, University Bordeaux I, Talence, France, also at Institut Universitaire de France, France

FK-3:IL05 **FFLO State in Heavy Fermion Superconductors**
Y. MATSUDA, Dept. of Physics, Kyoto University, Kyoto, Japan

FK-3:IL06 **Optical Spectroscopy Study on Fe-pnictides**
NAN LIN WANG, Institute of Physics, Chinese Academy of Sciences, Beijing, China

FK-3:IL07 **Neutron Scattering of Cuprate Superconductor**
K. YAMADA, M. FUJITA, H. HIRAKA, Tohoku University, Sendai, Miyagi, Japan; M. MATSUDA, S. WAKIMOTO, Japan Atomic Energy Agency, Japan

FK-3:L08 **High-pressure Oxygenation of MT-YBCO**
T.A. PRIKHNA[1], X. CHAUD[2], W. GAWALEK[3], A.P. SHAPOVALOV[1], A. JOULAIN[4], J. RABIER[4], V.E. MOSHCHIL[1], Ya.M. SAVCHUK[1], N.V. SERGIENKO[1], S.N. DUB[1], V.S. MELNIKOV[1], T. HABISREUTHER[3], D. LITZKENDORF [3], J. BIERLICH[3], [1]Inst. for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine; [2]CNRS/CRETA, Grenoble, France; [3]Inst. für Photonische Technologien, Jena, Germany; [4]Université de Poitiers, CNRS/Lab. de Metallurgie Physique, Chasseneuil Futuroscope, France

FK-3:L09 **Bulk YBCO Superconductors with New Microstructural Design**
P. DIKO[1], V. ANTAL[1], M. SEFEIKOVÁ[1], J. KOVÁC[1], X. CHAUD[2], M. EISTERER[3], H.W. WEBER[3], [1]Inst. of Experimental Physics SAS, Kosice, Slovakia; [2]CNRS/CRETA, Grenoble, France; [3]Vienna University of Technology, Atominstitut, Vienna, Austria

FK-3:IL10 **BCS Superconducting Gap in Electron-doped Cuprates**
I. DIAMANT, **Y. DAGAN**, School of Physics and Astronomy, Tel Aviv University, Tel Aviv, Israel

FK-3:IL11 **Isotope Effects and Multi-band Superconductivity in Layered High-temperature Superconductors**
H. KELLER, Physik-Institut der Universität Zürich, Zürich, Switzerland

Session FK-4
Theory and Mechanisms

FK-4:IL01 **Energy Scale Phenomenology of Novel Superconductors**
Y.J. UEMURA, Physics Dept., Columbia University, New York, NY, USA

FK-4:IL02 **Exchange-interaction Induced Pairing in Strongly Correlated Systems**
J. SPALEK, M. SMOLUCHOWSKI, Institute of Physics, Jagiellonian University, Krakow, Poland and AGH University of Science and Technology, Krakow, Poland

FK-4:IL03 **Theory for Inhomogeneous Superconductors: Approach from the t-J Model**
M. OGATA, Dept. of Physics, University of Tokyo, Tokyo, Japan

Session FK-5
Vortex Lattice Physics

FK-5:IL01 **Summation of Strong Pinning Forces**
F.M. SAUERZOPF, Atominstitut, Vienna University of Technology, Vienna, Austria

FK-5:IL02 **Type-1.5 Superconductivity**
V.V. MOSHCHALKOV, INPAC-Institute for Nanoscale Physics and Chemistry, Katholieke Universiteit Leuven, Leuven, Belgium

FK-5:IL03 **Critical Current Densities in Ba(Fe,Co)2As2 and FeTe1-xSex**
T. TAMEGAI, Y. TSUCHIYA, T. TAEN, Y. NAKAJIMA, Dept. of Applied Physics, The University of Tokyo and JST-TRIP, Tokyo, Japan; S. OKAYASU, Advanced Sci. Res. Center, JAEA, Tokai, Ibaraki, Japan; M. SASASE, The Wakasa-wan Energy Res. Center, Nagatani, Fukui, Japan

FK-5:IL04 **Non-centrosymmetric Superconductors: Extreme Vortex Pinning in CePt3Si and Li2Pt3B**
C.F. MICLEA, Los Alamos National Laboratory, Los Alamos, NM, USA; A.C. MOTA, M. NICKLAS, F. STEGLICH, Max-Planck-Inst. for Chemical Physics of Solids, Dresden, Germany; M. SIGRIST, Inst. for Theoretical Physics, ETH Zurich, Switzerland; M.B. MAPLE, Dept. of Physics and Inst. for Pure and Applied Physical Sciences, Univ. of California-San Diego, La Jolla, CA, USA; E. BAUER, Inst. für Festkoerperphysik, Technische Univ. Wien, Wien, Austria

Session FK-6
Synthesis and Processing

FK-6:IL01 **Progress in Chemical Solution Approaches to Nanocomposite Superconducting Films**
X. OBRADORS, T. PUIG, A. POMAR, S. RICART, A. LLORDÉS, A. PALAU, R. VLAD, H. CHEN, K. ZALAMOVA, F. SANDIUMENGE, P. ABELLÁN, F. MARTÍNEZ, M. GIBERT, X. GRANADOS, Institut de Ciencia de Materials de Barcelona, CSIC Campus de la UAB, Bellaterra, Catalonia, Spain

FK-6:IL02 **Stability Conditions for Charge Density Wave and Superconducting States in Intercalated 1T-dichalcogenides**
A. GAUZZI, A. SELLAM, G. ROUSSE, M. D'ASTUTO, A. SHUKLA, M. CALANDRA, F. MAURI, IMPMC, Universite Pierre et Marie Curie and CNRS, Paris, France; E. GILIOLI, IMEM-CNR, Parma, Italy; I. MAZIN, Naval Research Laboratory, Washington, DC, USA

FK-6:L03 **Deposition of YBCO FOR 2G Conductors Using Laser Direct Write**
M. OSOFSKY, A. PIQUÉ, K. METKUS, T.E. SUTTO, Naval Research Lab., Washington, DC, USA; M. RUPICH, S. SATHYAMURTHY, American Superconductor, Inc., Devens, MA, USA

FK-6:L04 **Development of Low-loss (Bi,Pb)-2223 Tapes with Interfilamentary Resistive Barriers**
R. INADA, Y. NAKAMURA, A. OOTA, Toyohashi University of Technology, Toyohashi, Aichi, Japan; C.S. LI, P.X. ZHANG, Northwest Institute for Nonferrous Metal Research, Xi'an, Shaanxi, P.R. China

FK-6:L05 **Critical Currents of MgB2 Wires Made of Differently Treated and Mixed Precursor Powders**
P. KOVÁC, I. HUSEK, M. KULICH, T. MELISEK, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia

FK-6:IL06 **Nernst Effect: In What Systems it Can Be Giant and Why?**
A.A. VARLAMOV, COHERENTIA-INFM, CNR, Rome, Italy

FK-6:IL07 **Novel Processing Techniques of Bulk HTS and the Role of Artificial Nanoparticles**
D.A. CARDWELL[1], Y. SHI[1], N. HARI BABU[1], A.D. DENNIS[1], K. IIDA[2], [1]Bulk Superconductor Group, Dept. of Engineering, University of Cambridge, Cambridge, UK; [2]IFW-Dresden, Dresden, Germany

Session FK-7
Power Applications

FK-7:IL01 **Fault Current Limiters - Materials, Applications and Prospects**
M. NOE, Karlsruhe Institute of Technology (KIT), Institute for Technical Physics (ITeP), Eggenstein-Leopoldshafen, Germany

FK-7:IL02 **High Temperature Superconducting Generators in Support of Wind Energy**
P.J. MASSON, Advanced Magnet Lab, Palm Bay, FL, USA

FK-7:IL03 **Numerical Modeling of AC Losses in FCL**
F. GRILLI, Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany

FK-7:IL04 **AC Loss in Coated Conductor Tapes and Coils**
E. PARDO, M. EISTERER, H.W. WEBER, Atominstitut, Vienna University of Technology, Vienna, Austria; J. SOUC, M. VOJENCIAK, F. GOMORY, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia

FK-7:L05 **AC Losses in HTSC Tapes with Ferromagnetic Part**
F. GÖMÖRY[1], M. VOJENÈIAK[1], S. SAFRAN[1, 2], Ö. ÇIÇEK[1, 2], J. SOUC[1], [1]Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia; [2]Physics Dept., Ankara University, Tandogan, Ankara, Turkey

FK-7:IL06 **High Current Low AC Loss HTS-ROEBEL-Cables for Energy Devices**
W. GOLDACKER, S. TERZIEVA, A. DRECHSLER, A. KUDYMOW, R. HELLER, R. NAST, F. GRILLI, Karlsruhe Institute of Technology, Institute for Technical Physics, Eggenstein-Leopoldshafen, Germany

FK-7:IL07 **HTS Materials for Magnets in High-radiation Environments**
R. GUPTA, G. GREENE, W. SAMPSON, Brookhaven National Laboratory, Upton, NY, USA

FK-7:IL08 **Seawater Magnetohydrodynamics Power Generator / Hydrogen Generator**
M. TAKEDA, Kobe University, Kobe, Hyogo, Japan

FK-7:IL09 **Failure Mechanisms in YBCO Coated Conductors**
J. SCHWARTZ, Dept. of Materials Science & Eng., North Carolina State University, Raleigh, NC, USA

Session FK-8
Low Power Applications and Superconducting Electronics

FK-8:IL01 **Potential Future Superconducting Electronics**
H. ROGALLA, Low Temperature Group, Fac. of Applied Science and MESA+ Institute, University of Twente, Enschede, The Netherlands

FK-8:IL02 **Macroscopic Quantum Tunneling and Resonant Activation in Bi-2212 Intrinsic Josephson Junctions**
S. SATO, K. INOMATA, H.B. WANG, Tohoku Univ., Sendai, Miyagi, Japan; RIKEN, Wako, Saitama, Japan; NIMS, Tsukuba, Ibaraki, Japan

FK-8:IL03 **Recent Research Developments in the DC Application of MgB2 Superconductors**
G. GRASSO, S. BRISIGOTTI, S. BERTA, A. TUMINO, D. PIETRANERA, M. PALOMBO, L. ROSTILA, R. PENCO, Columbus Superconductors SpA, Genova, Italy

FK-8:IL04 **Coherent and Continuous THz Waves Generated from high Tc Superconductor Bi2Sr2CaCu2O8+d**
K. KADOWAKI, M. TSUJIMOTO, K. DEGUCHI, K. IVANOVIC, T. KASHIWAGI, H. MINAMI, R.A. KLEMM, M. TACHIKI, Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki, Japan

FK-8:IL05 **Terahertz Radiation from Intrinsic Josephson Junctions**
U. WELP[1], A.E. KOSHELEV[1], M. TACHIKI[2], K. KADOWAKI[3], T. YAMAMOTO[3], H. MINAMI[3], H. YAMAGUCHI[3], K.E. GRAY[1], W.-K. KWOK[1], [1]Materials Science Division, Argonne National Laboratory, Argonne, IL, USA; [2]Graduate School of Frontier Sciences, University of Tokyo, Kashiwa, Japan; [3]Institute of Materials Science, University of Tsukuba, Ibaraki, Japan

FK-8:IL06 **Theory on THz Radiation of Intrinsic Josephson Junctions of Cuprate Superconductor**
SHI-ZENG LIN, **XIAO HU**, World Premier International Center for Materials Nanoarchitectonics, National Institute for Materials Science, Tsukuba, Japan

Poster Presentations

FK:P01 **Ic of Al_2O_3-doped Bi-2212 Single Crystals**
H. IMAO, Matsue National College of Engineering, Matsue, Japan; S. KISHIDA, Tottori University, Japan

FK:P02 **Measurement the Pinning Energy of Partial Melted Superconductors**
S. TAKAHASHI, H. IMAO, Matsue National College of Engineering, Matsue, Japan; S. KISHIDA, Tottori University, Japan

FK:P03 **A Multi-band Model for $LaO_{\{1-x\}}F_{\{x\}}FeAs$**
G. MURGUIA, S. OROZCO, M.A. ORTIZ, R.M. MÉNDEZ-MORENO, P. DE LA MORA, Dpto de Física, Universidad Nacional Autónoma de México, México D.F., México

FK:P04 **Grain Morphology for Ag-sheathed Bi2Sr2CaCu2O8 Tapes Heat-treated in High Magnetic Fields**
K. WATANABE, T. INOUE, S. AWAJI, Institute for Materials Research, Tohoku University, Sendai, Japan

FK:P05 **Effect of Partially Reacted Precursor Powders on the Microstructure of Bi2223/Ag Tapes**
J.-C. GRIVEL, Materials Research Division, Risoe National Lab. for Sustainable Energy, Technical University of Denmark, Roskilde, Denmark

FK:P06 **Synthesis and Precise Analysis of Bi2Sr2Can-1CunOy Superconducting Whiskers**
H. TANAKA[1], H. YOSHIKAWA[2], M. KIMURA[2], C. TSURUTA[3], S. FUKUSHIMA[2], Y. MATSUI[3], S. NAKAGAWA[4], K. KINOSHITA[4], S. KISHIDA[4], [1]Dept. of Electrical and Computer Engineering, Yonago National College of Technology, Tottori, Japan; [2]Dept. of Materials Infrastructure, National Institute for Materials Science, Hyogo, Japan; [3]Advanced Nano-Characterization Center, National Institute for Materials Science, Tsukuba, Japan; [4]Graduate School of Electrical and Electronic Eng., Tottori University, Tottori, Japan

FK:P07 **Synthesis and Structural Characterization of Hg(Re)-Pb-Ca-Ba-Cu-O Superconducting Thin Films Grown by Spray Pyrolysis**
C. MEJÍA-GARCÍA, J.L. LÓPEZ-LÓPEZ, E. DÍAZ-VALDÉS, C.V. VÁZQUEZ-VERA, Escuela Superior de Física y Matemáticas, IPN, México D.F., México

FK:P08 **Processing by Pulsed Laser Deposition and Structural, Morphological and Chemical Characterization of Bi-Pb-Sr-Ca-Cu-O and Bi-Pb-Sb-Sr-Ca-Cu-O Thin Films**
V. RÍOS, **E. DÍAZ**, J.R. AGUILAR, J.I. GUZMÁN, T. KRYSHTAB, ESFM-IPN, Delegación G.A.M., México D.F., México

FK:P09 **Investigation of the Effect of Resistive Switching on Superconducting Characteristics in YBa2Cu3Ox**
A. HANADA, K. KINOSHITA, K. MATSUBARA, K. DEGUCHI, S. KISHIDA, Tottori University, Tottori, Japan

FL - 9th International Conference
MEDICAL APPLICATIONS OF NOVEL BIOMATERIALS AND NANO-BIOTECHNOLOGY

Oral Presentations

Session FL-1
Advances in Biomaterials

FL-1:IL01 **Nanostructural Control of Bioceramics and the Merger of Devices with Biologicals**
P. DUCHEYNE, Center for Bioactive Materials and Tissue Engineering, University of Pennsylvania, Philadelphia, PA, USA

FL-1:IL02 **Essential Factors to Make Excellent Biocompatibility of Phospholipid Polymer Materials**
K. ISHIHARA, T. KONNO, Y. INOUE, Dept. of Materials Engineering, The University of Tokyo, Tokyo, Japan, and CREST, Japan Science and Technology Agency, Japan

FL-1:IL03 **Biomedical Applications of Peptide-polymer Conjugates Self-assemblies**
C. SANSON[1, 2], K.K. UPADHYAY[1, 2, 3], A. MISRA[3], C. SCHATZ[1, 2], J.-F. LE MEINS[1, 2], **S. LECOMMANDOUX**[1, 2], [1]Université de Bordeaux, UMR5629, ENSCPB, Pessac, France; [2]CNRS, Lab. de Chimie des Polymères Organiques, UMR5629, Pessac, France; [3]Pharmacy Dept., Kalabhavan, Maharaja Sayajirao University of Baroda, Vadodara, Gujarat state, India

FL-1:IL04 **Development of Cardiovascular Implants Using Nanocomposite Polymer and Stem Cell Technology: From Lab to Commercialisation**
A.M. SEIFALIAN, A. DEMEL, H. GHANBARI, M. AHMED, A. DARBYSHIRE, Centre for Nanotechnology, Biomaterials & Tissue Engineering, UCL Division of Surgery & interventional Science, University College London, UK

FL-1:IL05 **Supramolecular Surfaces Modulating Cellular Response**
N. YUI, R. KATOONO, D.H. YANG, Japan Advanced Institute of Science and Technology, Ishikawa, and JST CREST, Tokyo, Japan

FL-1:IL06 **Molecular Modelling and Experimental Investigation of Hydrolytically Degradable Polymeric Biomaterials**
D. HOFMANN, M. ENTRIALGO, A. KULKARNI, K. KRATZ, A. LENDLEIN, Centre for Biomaterial Development, GKSS Research Center, Teltow, Germany

FL-1:IL07 **Nanocomposites with Bone Inductive Properties**
J.A. JANSEN, X.F. WALBOOMERS, M. VAN DER ZANDE, Dept. of Biomaterials, Radboud University Nijmegen Medical Center, Nijmegen, The Netherlands; A.G. MIKOS, B. SITHARAMAN, Dept of Bioeng., Rice University, Houston, USA; L. WILSON, Dept of Chemistry, Rice University, Houston, USA

FL-1:IL08 **Nanocrystalline Carbonate Apatite Due to Chemical Conversion of Calcium Carbonates**
K. ISHIKAWA, Kyushu University, Fukuoka, Japan

FL-1:IL09 **Novel, Rapidly Resorbable Bioceramic Bone Grafts Produce a Major Osteogenic Effect - The Pre-clinical Evidence**
C. KNABE, Dept. of Experimental Dentistry, Charité - University Medical Center Berlin, Germany

FL-1:IL10 **A New Method to Measure Coagulability of a Patient's Blood. Use of a Moderately Thrombogenic Biomaterial and a Miniaturized Flow Reactor**
L.H. KOOLE, L.L.H. BOTH, M.L.W. KNETSCH, Dept. of Biomedical Eng./ Biomaterials Science, Faculty Health, Medicine and Life Sciences Maastricht University, Maastricht, The Netherlands

FL-1:L11 **Apatite Deposition on Inner-surfaces of Titanium Substrate Pairs; GRAPE® Technology**
A. SUGINO, K. UETSUKI, S. HAYAKAWA, Y. SHIROSAKI, K. TSURU, K. KURAMOTO, **A. OSAKA**, Graduate School of Natural Science and Technology, Okayama University, Okayama-shi, Japan

FL-1:L12 **Neuronal Printed Circuit Board: N-dimensional Aerogel-based Nerve Guidance Tool**
F. SABRI, Univ. of Memphis, Dept. of Physics, Memphis, TN, USA; J. COLE, Univ. of Memphis, Dept of Biology, USA; N. LEVENTIS, Dept of Chemistry, Rolla, Missouri, USA

FL-1:L13 **Mechanistic Study of Deposited Hydroxyapatite(HAp) on Biocompatible TiO2 Nanotubes**
YU-JEONG CHO, W.H. LEE, Materials Design & Processing Develop. Lab., Dept. of Advanced Materials Engineering, Sejong University, Seoul, Korea

FL-1:L14 **Hydroxyapatite and Chlorapatite Thin Coatings Obtained by a Novel Plasma Mini-torch Process**
I. DEMNATI, D. GROSSIN, C. DROUET, C. COMBES, C. REY, Université de Toulouse- CIRIMAT CNRS-INPT-UPS ENSIACET, Toulouse, France; M. PARCO, I. FAGOAGA, G. BARYKIN, I. BRACERAS, INASMET-Tecnalia, Donostia-San Sebastian, Spain; S. GONCALVES, TEKNIMED S.A, L'Union, France

FL-1:L15 **Molecularly Imprinted Polymer Layers for the Selective Uptake and Release of Glutamate for Application in a Neurochemical Switch**
E. VON HAUFF, K. FUCHS, J. PARISI, Inst. for Physics, Energy and Semi-conductor Research Lab., Carl von Ossietzky Univ. of Oldenburg, Oldenburg, Germany; **N. PAUL**, M. Lux-Steiner Inst. for Heterogeneous Material Systems, Helmholtz Centre Berlin for Materials und Energy, Berlin, Germany; U. KRAUSHAAR, E. GUENTHER, Cell Biologie, AG Elektrophysiology, Natural and Medical Sciences Inst. at the University of Tübingen, Reutlingen, Germany

FL-1:L16 **Functionalization of Poly(l-lactic acid) at High Concentration of Maleic Anhydride**
D. MUENPRASAT, S. SUTTIREUNGWONG, Dept. of Materials Science and Engineering, Silpakorn University, Nakorn Pathom, Thailand

FL-1:L17 **Monolithic Glass Scaffolds with Dual Hierarchical Porosity Prepared by Sol-gel**
R.M. ALMEIDA, A. TEIXEIRA, Y. VUEVA, Dept. Eng. Materiais/ICEMS, Instituto Superior Técnico/TU Lisbon, Lisboa, Portugal

FL-1:L18 **Study of BSA Adsorption on Silicon Plasma Deposit with Silver Nanoparticles by QCM and XPS**
CHUN WANG[1], S. ZANNA[1], I. FRATEUR[1], B. DESPAX[2], P. RAYNAUD[2], P. MARCUS[1], [1]Lab. de Physico-Chimie des Surfaces, CNRS-ENSCP (UMR 7045), Ecole Nationale Supérieure de Chimie de Paris, Chimie-ParisTech, Paris, France; [2]Lab. Plasma et Conversion d'Energie, UMR CNRS 5003 Université Paul Sabatier, Toulouse, France

FL-1:L19 **Preparation and Characterization of Bioglass-Ceramic/ Multiwall Carbon Nanotube Composite**
P. KIRDSIRI, P. SOOKSAEN, S. SUTTIRUENGWONG, Dept. of Materials Science and Engineering, Fac. of Eng. and Industrial Technology, Silpakorn University, Nakorn Pathom, Thailand

FL-1:L20 **Hydrothermal Synthesis of Hydroxyapatite Particles from Different Raw Materials and their Characterization**
M. KAMITAKAHARA, Y. ENARI, N. ITO, N. WATANABE, K. IOKU, Graduate School of Environmental Studies, Tohoku University, Sendai, Miyagi, Japan

FL-1:L21 **Development of Craniofacial Implants Produced by Metal Injection Molding of Titanium Alloy Using Novel Binder System Based on Palm Oil**
R. IBRAHIM, M. AZMIRRUDDIN, M. JABIR, M. RIDHUAN, M. MUHAMAD, M. RAFIQ, N.A. KASIM, S. MUHAMAD, Kulim, Malaysia

FL-1:L22 **Tunable Antibacterial Coatings that Support Mammalian Cell Growth**
K. VASILEV, Mawson Inst. and School of Advanced Manufacturing, University of South Australia, Mawson Lakes, Australia

FL-1:L23 **Development of Bone-integrating Hybrid Materials Useful for Hard Tissue Repair**
TOSHIKI MIYAZAKI, Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology, Kitakyushu, Japan

FL-1:L24 **Mineralization of Eroded Dental Enamel Seeded with Fluoride and a Tricalcium Phosphate Ternary Biomaterial**
R.L. KARLINSEY, A.C. MACKEY, E.R. WALKER, T.J. WALKER, Indiana Nanotech, Indianapolis, IN, USA; C.X. FOWLER, GlaxoSmithKline, USA

FL-1:L25 **In-situ Investigation of Temperature Influence on Calcium Phosphate Cement Hydration**
F. GOETZ-NEUNHOEFFER, J. NEUBAUER, University Erlangen, GeoZentrum Nordbayern, Mineralogy, Erlangen, Germany

FL-1:L26 **A Novel Rich-phosphate Coating on Zirconia with High Bonding Strength to Surface**
A. VALANEZHAD, K. TSURU, M. MICHITO, G. KAWACHI, S. MATSUYA, K. ISHIKAWA, Dept. of Biomaterials, Fac. of Dental Science, Kyushu University, Fukuoka, Japan; Dept. of Dental Eng., Fukuoka Dental College, Fukuoka, Japan

FL-1:L27 **Adhesion Mechanisms at the Interface Between Y-TZP and a Veneering Ceramic for Dental Application**
G. IORIZZO, P. CARDELLI, C. MONACO, R. SCOTTI, Dip. di Scienze Odonto-stomatologiche, Italy; L. ESPOSITO, A. TUCCI, Centro Ceramico Bologna, Italy

FL-1:L28 **Fabrication of Bioactive Organic Polymer-apatite Nuclei Composite**
T. YABUTSUKA, M. HIBINO, T. YAO, Graduate School of Energy Science, Kyoto University, Kyoto, Japan

FL-1:L29 **Laser Rapid Prototyping of Microstructured Medical Devices using Inorganic-organic Hybrid Materials**
R.J. NARAYAN, S.D. GITTARD, A. DORAISWAMY, Dept. of Biomedical Engineering, University of North Carolina, Chapel Hill, USA; A. OVSIANIKOV, B. CHICHKOV, Laser Zentrum Hannover, Hannover, Germany

FL-1:L30 **Nanocrystalline Apatite Coatings and Osteoinduction**
H. AUTEFAGE, C. COMBES, S. CAZALBOU, **C. REY**, University of Toulouse, CIRIMAT, UPS-INPT-CNRS, ENSIACET, Toulouse, France; F. BRIAND-MÉSANGE, INSERM U563, CPTP, Lipoproteins and Lipid Mediators Lab., CHU Purpan, Toulouse, France; A. GOMEZ-BROUCHET, Pathological Anatomy and Cytology Dept., CHU Toulouse-Rangueil, Toulouse, France; S. PALIERNE, A. AUTEFAGE, D. MATHON, Small Animal Surgery Dept., National Veterinary School of Toulouse, Toulouse, France; S. GONÇALVÈS,Teknimed, L'Union, France; P. SWIDER, University of Toulouse, Biomechanics Lab. EA3697, CHU Purpan, Toulouse, France

FL-1:L31 **Programmable Shape Shifting Polymeric Nanoparticles**
M.-P. CHIEN, M. THOMPSON, A.M. RUSH, **N.C. GIANNESCHI**, University of California San Diego, La Jolla, USA

FL-1:L32 **Microstructure and Mechanical Properties of Iron-containing Hydroxyapatite/Titanium Composites**
Q. CHANG[1, 2], **DAOLUN CHEN**[1], H.Q. RU[2], X.Y. YUE[2], L. YU[2], C.P. ZHANG[2], [1]Dept. of Mechanical and Industrial Eng., Ryerson University, Toronto, Ontario, Canada; [2]Dept. of Materials Science and Eng., School of Materials and Metallurgy, Northeastern University, Shenyang, China

FL-1:L33 **Nonequilibrium Mechanics of Liquid Crystal Elastomers**
W.S. OATES, Florida A&M & Florida State University, Dept. of Mechanical Engineering, Tallahassee, FL, USA

FL-1:L34 **Transparent Nanostructure for Observing Live Cell Proliferation and Migration**
JUNGIL CHOI, SANGWON SHIN, JONGHAN SONG, SANG-SOO KANG, TAE-HYUN NAM, **DONGWOO KHANG**, Center for Nano-morphic Biological Energy, Gyeongsang National University, Jinju, South Korea; School of Nano and Advanced Materials Science Eng., Gyeongsang National University, Jinju, South Korea; Nanoscale device analysis center, Korea Institute of Science and Technology, Seoul, South Korea; Dept. of Anatomy & Neuro-biology, School of Medicine, Gyeongsang National University, South Korea

FL-1:L35 **Nanostructured Ti-Ni Shape Memory Alloy: Possibilities of Functional Behavior Regulation**
E.P. RYKLINA, S.D. PROKOSHKIN, A.A. CHERNAVINA, National University of Science and Technology "MISIS", Moscow, Russian Federation

FL-1:L36 **Preparation of Bioactive Titania Nanotube Arrays For Enhanced Biomedical Applications**
R. HAZAN, S. SREEKANTAN, School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia, Pulau Pinang, Malaysia; A.A. KHALIL, S. SALWA ZULKIFLI, I. MAT, Translational Research Network Centre, Advance Medical and Dental Institute, Universiti Sains Malaysia, Pulau Pinang, Malaysia

Session FL-2
Enabling Tools

FL-2:IL01 **Sensing of Protein Adsorption by Composites Consisting of Silver Nanoparticles and Hydroxyapatite**
C. OHTSUKI, Y. ICHIKAWA, H. SHIBATA, T. TORIMOTO, ILL YONG KIM, Graduate School of Engineering, Nagoya University, Nagoya, Japan

FL-2:IL02 **Simultaneous Deposition of Biomaterials and Cells for Regenerative Medicine**
J. MALDA[1], N.E. FEDOROVICH[1], W. SCHUURMAN[1, 2], J. ALBLAS[1], P.R. VAN WEEREN[2], W.J.A. DHERT[1, 2, 3], [1]Dept. of Orthopaedics, University Medical Center Utrecht, Utrecht, The Netherlands; [2]Dept. of Equine Sciences, Utrecht University, Utrecht, The Netherlands; [3]Dept. of Veterinary Sciences, Utrecht University, Utrecht, The Netherlands

FL-2:IL03 **Antifouling Behavior of Hydrophilic Surface Designed by Polyelectrolyte Brushes**
M. KOBAYASHI, **A. TAKAHARA**, JST/ERATO Soft Interface Project, Kyushu University, Fukuoka, Japan

FL-2:IL04 **A Window with a View: Two Photon Imaging as a Non Invasive Tool to Study Cellular Form and Function in Vivo**
M. BRONDI, S. LANDI, S. SULIS SATO, SNS; **G.M. RATTO**, NEST/SNS, Pisa, Italy

FL-2:L05 **New Block Copolymer Nanoparticles for DNA/RNA Delivery: in Vitro and in Vivo Applications**
D. VELLUTO, J.A. HUBBELL, Institute of Bioengineering and Institute of Chemical Science and Eng., Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland

FL-2:L06 **Analysis of Receptor Conformation and its Functional Relations for Biomimetic Device**
K. TORIMITSU, Y. SHINOZAKI, N. KASAI, A. SHIMADA, K. SUMITOMO, Y. FURUKAWA, NTT Basic Research Labs, NTT Corp., JST, Atsugi, Japan

Session FL-3
Medical Diagnosis Applications

FL-3:IL01 **DNA Diagnostics Using New Cationic Polymers**
A. MARUYAMA, Institute for Materials Chemistry and Eng., Kyushu University, Fukuoka, Japan

FL-3:IL02 **Sensor Technologies to Probe Cell-material Interactions**
S. MICHAELIS, **J. WEGENER**, Institute of Analytical Chemistry, Chemo- & Biosensors, University of Regensburg, Regensburg, Germany

FL-3:IL03 **Novel Biomaterials and Nano-biotechnology Approaches in Tumor Diagnosis**
A.K. DINDA, Dept. of Pathology, All India Institute of Medical Sciences, New Delhi, India

FL-3:L04 **Biomimetic Systems as Luminescent Nanoprobes for Medical Imaging**
A. AL-KATTAN, P. DUFOUR, C. DROUET, CIRIMAT Carnot Inst., University of Toulouse, CNRS/INPT/UPS, ENSIACET, Toulouse, France; J. DEXPERT-GHYS, CEMES 29, Toulouse, France; J. BERNAD, B. PIPY, Lab. des Macrophages Médiateurs de l'Inflammation et Interactions Cellulaires, Univ. Paul-Sabatier - EA 2405, Inst. National de la Santé et de la Recherche Médicale IFR 31, Hôpital Rangueil, Toulouse, France

FL-3:L05 **NMR Study of Novel Contrast Agents for MRI Based on Mn-ferrites and Co-ferrites**
M. MARIANI, C. CORTI, Dip. Fisica "A. Volta", Università degli Studi di Pavia, Unità CNISM, Pavia, Italy, and S3-CNR-INFM, Modena, Italy; A. LASCIALFARI, Dip. Fisica "A. Volta", Università degli Studi di Pavia, Unità CNISM, Pavia, Italy, and Dip. Scienze Molecolari Applicate ai Biosistemi, Università degli Studi di Milano, Milano, Italy, and S3-CNR-INFM, Modena, Italy; P. AROSIO, Dip. Scienze Molecolari Applicate ai Biosistemi, Università degli Studi di Milano, Milano, Italy, and S3-CNR-INFM, Modena, Italy; M.F. CASULA, Dip. Scienze Chimiche e INSTM, Università di Cagliari, Monserrato (CA), Italy; A. BONI, C. INNOCENTI, C. SANGREGORIO, Dip. Chimica e INSTM, Università degli Studi di Firenze, Sesto Fiorentino (FI), Italy

FL-3:L06 **Highly-sensitive pH Detectors Based on Localized Nanowire Arrays**
V.A. ANTOHE, M. MÁTÉFI-TEMPFLI, L. PIRAUX, S. MÁTÉFI-TEMPFLI, Unité de Physico-Chimie et de Physique des Matériaux, UCL, Louvain-la-Neuve, Belgique; A. RADU, Dept.of Materials and Electronic & Optoelectronic Devices, UB, Bucharest - Mãgurele, Romania

FL-3:L07 **Creation of Superelastic Functional Properties in a Ti-50.7%Ni Wire for the Stapler Suturing of Blood Vessels**
I. KHMELEVSKAYA[1], M. SOUTORINE[2], S. PROKOSKIN[1], E. RYKLINA[1], [1]National University of Science and Technology "MISIS", Moscow, Russia; [2]"Endogene Pty" Ltd, Brighton, Victoria, Australia

FL-3:L08 **Properties of Hydroxyapatite from Bovine Teeth**
A. ELKAYAR, Y. ELSHAZLY, **M. ASSAAD NADA**, Alexandria, Egypt

FL-3:L09 **Preparation and Characterization of a Chitosan-polyaniline/ Magnetite Superparamagnetic Nanocomposites**
J.B. PEREIRA Jr., A.C.V.A LAPA, W.M. AZEVEDO, Dept. of Fundamental Chemistry, Federal University of Pernambuco, Recife, PE, Brazil; F.A.O. CABRAL, Dept. of Theoretical and Experimental Physics, Federal University of Rio Grande do Norte, Natal, RN, Brazil

Session FL-4
Regenerative Medicine and Tissue Engineering

FL-4:IL01 **Is Nanotechnology Really Increasing Tissue Growth? Separating the Hype from Data**
T.J. WEBSTER, Division of Eng. and Dept. of Orthopaedics, Brown University, Providence, RI, USA

FL-4:IL02 **Calcium-deficient Hydroxyapatite for Metabolism of Subsequently Formed Bone Tissue**
K. IOKU, M. KAMITAKAHARA, Graduate School of Environmental Studies, Tohoku University, Sendai, Miyagi, Japan; T. IKEDA, Graduate School of Biomedical Sciences, Nagasaki University, Nagasaki, Japan

FL-4:L03 **Self-collapse and Sliding of Nanotubes in a Bundle**
N. PUGNO, Lab. of Bio-inspired Nanomechanics "Giuseppe Maria Pugno", Dept. of Structural Engineering and Geotechnics, Politecnico di Torino, Torino, Italy; National Inst. of Nuclear Physics (INFN), National Labs of Frascati, Frascati, Italy; National Inst. of Metrological Research (INRIM), Torino, Italy; Consorzio Nazionale Interuniversitario per le Scienze Fisiche della Materia (CNISM), Roma, Italy

FL-4:L04 **Preparation of PMGI Polymer Nanofibrous Scaffolds for Cardiac Tissue Engineering with Defined Degree of Anisotropy**
YU. ORLOVA, N. MAGOME, LI LIU, Y. CHEN, **K. AGLADZE**, Institute for Integrated Cell-Material Sciences, Kyoto University, Kyoto, Japan

FL-4:L05 **Modeling the Elastic Anisotropy of Woven Hierarchical Tissues: Experimental Comparison on Biological Materials and Design of a New Class of Scaffolds**
N.M. PUGNO, **QIANG CHEN**, Lab. of Bio-Inspired Nanomechanics "Giuseppe Maria Pugno", Dept. of Structural Engineering and Geotechnics, Politecnico di Torino, Torino, Italy

FL-4:IL06 **Biomaterial Scaffolds & Intercellular Signaling in Engineered Bone and Cartilage**
J.P. FISHER, Fischell Dept. of Bioengineering, University of Maryland, College Park, MD, USA

FL-4:IL07 **Nano-biointerface for Medical Application**
Y. NAGASAKI, Tsukuba Research Center for Interdisciplinary Materials Science (TIMS), Center for Tsukuba Advanced Research Alliance (TARA) and Master's School of Medical Sciences, University of Tsukuba, Satellite Lab. of International Center for Materials Nanoarchitechtonics, Tsukuba, Ibaraki, Japan

FL-4:L08 **Super-hydrophobic Surfaces by Direct Replication of Natural Leaves**
E. LEPORE, N. PUGNO, Lab. of Bio-Inspired Nanomechanics "Giuseppe Maria Pugno", Dept. of Structural Engineering and Geotechnics, Politecnico di Torino, Torino, Italy

FL-4:L10 **Elastic Properties of Fractal-like Scaffolds for Maximal Anisotropic Tissue Regeneration**
A. CARPINTERI, P. CORNETTI, N. PUGNO, **A. SAPORA**, Politecnico di Torino, Dipartimento di Ingegneria Strutturale e Geotecnica, Torino, Italy

FL-4:IL11 **Bone-mimetic Laminated Nano-structures for Regeneration of Skeletal Tissues**
E. JABBARI, Biomimetic Materials and Tissue Engineering Lab., Dept. of Chemical Eng., University of South Carolina, Columbia, SC, USA

FL-4:IL12 **Engineered Biomimetic Nanofibers for Regenerative Medicine**
S. RAMAKRISHNA, J. REDDY VENUGOPAL, S. LIAO, National University of Singapore, Singapore

FL-4:IL13 **In vivo MRI Tracking of Transplanted Stem Cells in Rat Hind Limb Ischemia**
T. YAMAOKA, C.A. AGUDERO, Y. TACHIBANA, H. IIDA, National Cardiovascular Center Research Institute, Suita, Japan

FL-4:IL14 **Tissue Engineering with Natural Tissue Matrices**
A. KISHIDA, S. FUNAMOTO, J. NEGISHI, Y. HASHIMOTO, K. NAM, T. KIMURA; T. FUJISATO; H. KOBAYASHI, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Chiyoda-ku, Tokyo, Japan; Osaka Institute of Technology, Osaka, Japan; Biomaterial Center, National Institute of Material Science, Tsukuba, Japan

FL-4:IL15 **Biomimesis in Bone and Tendon Tissue Engineering**
V. SIKAVITSAS, J. ALVAREZ-BARRETO, R. ABOUSLEIMAN, S. VAN GORDON, R. VORONOV, W. YATES, B. LANDY, D. PAPAVASSILIOU, P. DEANGELIS, The University of Oklahoma, Norman, OK, USA

FL-4:IL16 **Tissue Engineering Technology with Biomaterials to Develop Regeneration Medicine and Stem Cell Biology**
Y. TABATA, Dept. of Biomaterials, Inst. for Frontier Medical Sciences, Kyoto University, Kyoto, Japan

FL-4:IL17 **Self Assembling and Microfabrication**
C. MIGLIARESI, E. SERVOLI, G. A. RUFFO, D. MANIGLIO, A. MOTTA, BIOtech - Dept. of Materials Science and Industrial Technologies, INSTM Research Unit, University of Trento, Trento, Italy

FL-4:L18 **A Hydroxyapatite-collagen Composite Useful to Make Bioresorbable Scaffolds for Bone Reconstruction**
G.D. GUERRA, C. CRISTALLINI, CNR Inst. for Composite and Biomedical Materials, Research Unit of Pisa, Pisa, Italy; N. BARBANI, E. ROSELLINI, Dept. of Chemical Engineering, Industrial Chemistry and Materials Science, University of Pisa, Pisa, Italy

FL-4:L19 **Growth Factor-immobilized PCL Porous Beads as a Bioactive Urethral Bulking Agent**
S.H. OH, I.G. KIM, J.H. LEE, Dept. of Advanced Materials, Hannan University, Daejeon, South Korea; J.Y. LEE, J.Y. LEE, Dept. of Urology, Catholic University, Seoul St. Mary's Hospital, Seoul, South Korea

FL-4:L20 **Catastrophic Instabilities in the Fracture of Nanotube Bundles**
N. PUGNO, **T. ABDALRAHMAN**, Dept. of Structural and Geotechnical Engineering, Lab. of Bio-Inspired Nanomechanics "Giuseppe Maria Pugno", Politecnico di Torino, Torino, Italy

Session FL-5
New Therapeutics and Intelligent Delivery Systems

FL-5:IL01 **Multi-functional Templates for Smart Targeting Delivery**
P. DUMY, O. RENAUDET, D. BOTURYN, Dept. of Molecular Chemistry, UMR-CNRS 5250, ICMG FR2607, University Grenoble I, Grenoble, France

FL-5:IL02 **Development of Ceramic Beads for Cancer Treatment**
M. KAWASHITA, Z. LI, N. MATSUI, Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan

FL-5:IL03 **Theragnostics for Molecular Imaging and Drug Delivery**
ICK CHAN KWON, Biomedical Research Center, Korea Institute of Science and Technology, Seoul, Korea

FL-5:L04 **Functionalized Amphiphilic Macromolecules for Drug Delivery and Biostabilization**
S. SPARKS, S. HEHIR, **K. UHRICH**, Rutgers University, Dept. of Chemistry, Piscataway, NJ, USA

FL-5:L05 **XPS Characterization of Iron Oxide and Gold Nanoparticles for Tumor Care**
G. SPERANZA[1], L. MINATI[1], S. TORRENGO[1, 2], C. MIGLIARESI[3], D. MANIGLIO[3], L. DALBOSCO[3], [1]FBK-IRST, Trento, Italy; [2]Physics Dept., University of Trento, Trento, Italy; [3]Material Engineering and Industrial Technologies Dept., University of Trento, Trento, Italy

FL-5:L06 **Novel Silicon Based Gene Carrier Systems**
A. SOMMERWERK, G. STRUCKMEYER, J. TILLMANN, M. UHR, J. SCHÄFER, H. RICHTER, **U. BAKOWSKY**, University of Marburg, Pharmazeutical Technology and Biopharmazeutics,Marburg, Germany

Session FL-6
Progress in Implant Prostheses

FL-6:IL01 **The Future of Implant Technology in Musculoskeletal Regeneration**
G. DUDA, Julius Wolff Inst. and Center for Musculoskeletal Surgery, Berlin-Brandenburg Center for Regenerative Therapies, Charité - Universitätsmedizin Berlin, Berlin

FL-6:IL02 **A Critical Assessment of the Clinical Efficacy and Cellular Response to Low Intensity Pulsed Ultrasound for Fracture Repair**
C.T. LAURENCIN, Y. KHAN, Dept. of Orthopaedic Surgery, University of Connecticut Health Center, Farmington, CT, USA

FL-6:IL03 **Surface Modification of Titanium-based Implants**
D. SCHARNWEBER, Max Bergmann Center of Biomaterials; B. SCHWENZER, General Biochemistry; both TU Dresden, Dresden, Germany

FL-6:IL04 **Sol-gel Derived Titania Coatings for Enhanced Bone and Soft Tissue Attachment on Titanium Implants**
T.O. NÄRHI, Dept. of Prosthetic Dentistry, Institute of Dentistry, University of Turku, Turku, Finland

FL-6:L05 **Nano-scale Evaluation of Surface Morphology Before and After Environmental Exposure in Vitro of an Advanced Alumina/ Zirconia Composite for Arthroplastic Applications**
KENGO YAMAMOTO, Dept. of Orthopedic Surgery, Tokyo Medical University, Tokyo, Japan; G. PEZZOTTI, Ceramic Physics Lab. & Research Inst. for Nanoscience, Kyoto Institute of Technology, Kyoto, Japan

FL-6:L06 **Carbon Nanotubes In Vitro and In Vivo Biological Effects**
S. BELLUCCI, INFN-Laboratori Nazionali di Frascati, Frascati, Italy

FL-6:L07 **Closure of Oroantral Communications Using Biodegradable Polyurethane Foam**
S.H. VISSCHER, B. VAN MINNEN, R.R.M. BOS, Dept. of Oral and Maxillofacial Surgery, University Medical Centre Groningen, Groningen, The Netherlands

FL-6:L08 **Role of Grain Size Fluctuations on the Environmental Resistance of Alumina-Zirconia Composite in Comparison with Commercially Available Monolithic Zirconia Femoral Heads**
N. SUGANO, Dept. of Orthopaedic Medical Eng., Osaka Univ. Grad. School of Medicine, Osaka, Japan; G. PEZZOTTI, Ceramic Physics Lab. & Research Inst. for Nano-science, Kyoto Inst. of Technology, Kyoto, Japan, The Center for Advanced Medical Eng. and Informatics, Osaka Univ., Osaka, Japan

FL-6:L09 **In Vivo Hemostatic Effect of Polyurethane Foam Compared to Collagen and Gelatin**
F.I. BROEKEMA[1], W. VAN OEVEREN[2], R.R.M. BOS[1], [1]Dept. of Oral and Maxillofacial Surgery, University Medical Center Groningen, Groningen, The Netherlands; [2]Dept. of Biomedical Engineering, University Medical Center Groningen, Groningen, The Netherlands

FL-6:L10 **Stoichiometry and Surface Stress Analyses in Advanced Alumina/Composites for Hip Arthroplastic Applications**
A.A. PORPORATI, G. PEZZOTTI, Ceramic Physics Lab., Kyoto Institute of Technology, Kyoto, Japan; K. LESSNAU, CeramTec AG, Plochingen, Germany

FL-6:L11 **Nanosized-hydroxyapatite Coating on Ti6Al4V Interference Screws Enhances the Biomechanical Properties**
B. AKSAKAL, Firat University, Technical Education Faculty, Dept. of Mech. Edu., Elazig, Turkey; M. DEMIREL, Adiyaman University, Technical Vocational School of Higher Education, Adiyaman, Turkey

Poster Presentations

FL:P01 **Shell Scaffolds for Bone Regeneration and Repair**
D. BELLUCCI, V. CANNILLO, A. SOLA, Dip. di Ingegneria dei Materiali e dell'Ambiente, Univ. degli Studi di Modena e Reggio Emilia, Modena, Italy

FL:P02 **New Nanostructured Chitosan Films for Reduced Bacterial Adhesion**
E. DAYYOUB, U. BAKOWSKY, Dept. of Pharmaceutical Technology and Biopharmaceutics, University of Marburg, Marburg, Germany

FL:P03 **Structural Parameters of New Mesoporous Silica/Hydroxyapatite Materials**
A. BORÓWKA, A. SZCZES, Faculty of Chemistry, Maria Curie-Sklodowska University, Lublin, Poland

FL:P04 **Preparation and Characterization of Biocompatible Nb-based Hard Coatings**
A. RUSSO, D. CASINO, S. PANSERI, M. MARCACCI, Istituti Ortopedici Rizzoli, Biomechanics Lab., Bologna, Italy; V. BRAIC, C.N. ZOITA, M. BALACEANU, A. VLADESCU, A. KISS, M. BRAIC, National Institute for Optoelectronics, Magurele-Bucharest, Romania

FL:P05 **XRD Studies on Transformation of Calcium-deficient Apatite to Beta and Alfa TCP in Dynamic and Technological Conditions**
B. HANDKE, A. ZIMA, Z. PASZKIEWICZ, **A. SLOSARCZYK**, AGH - University of Science and Technology, Cracow, Poland

FL:P06 **Effects of Mg Additives on Properties of Mg-doped Hydroxyapatite Ceramics**
A. ZIMA, A. SLOSARCZYK, Z. PASZKIEWICZ, M. STASZEWSKA, AGH - University of Science and Technology, Cracow, Poland; W. MRÓZ, Military University of Technology, Warsaw, Poland; A. CHROSCICKA, Medical University of Warsaw, Warsaw, Poland

FL:P07 **Influence of the Processing Method in the Water Solubility and Water Vapor Permeability in Bioplastics's Films**
F.M. FAKHOURI[1], D.L.M. COSTA[2], F. YAMASHITA[3], L.H. INNOCENTINI MEI[1], F.P. COLLARES QUEIROZ[1], [1]School of Chemical Eng., State University of Campinas, UNICAMP, Campinas-SP, Brazil; [2]Dept. of Chemistry and Environment, UNED Bela Vista, CEFET-MT, Cuiabá - MT, Brasil; [3]State University of Londrina, Dept. of Food Science and Tech., Londrina-PR, Brasil

FL:P08 **Evaluation of CaO-SiO2-P2O5-Na2O-Fe2O3 Glass-ceramics for Hyperthermia Application**
R.K. SINGH, A. SRINIVASAN, Dept. of Physics, Indian Institute of Technology, Guwahati, India

FL:P09 **Silver Ions Release from Nanocomposites Based on Styrene/ Divinylbenzene with Antimicrobial Activity**
K. SEGALA[1], R.L. DUTRA[2], **L.H. INNOCENTINI-MEI**[1], C.V. FRANCO[2], [1]State University of Campinas-UNICAMP, School of Chemical Eng., Campinas, SP, Brazil; [2]Universidade Federal de Santa Catarina, Centro de Ciências Físicas e Matemáticas, Dpto de Química, UFSC Trindade, Florianopolis, SC, Brasil

FL:P10 **New Corrosion-resistant Bactericidal Nitrogen-containing Steels with Increased Strength**
L. KAPUTKINA, **V. PROKOSHKINA**, A. SVYAZHIN, National University of Science and Technology "MISIS", Moscow, Russia

FL:P11 **Evaluation of the Apatite Coating on Silicon Nitride Based Ceramics Sintered with RE2O3 Additives (RE = Y, La, Yb)**
J. MARCHI, CCNH, Universidade Federal do ABC, Santo André, SP, Brazil; C.C. GUEDES E SILVA, CTMSP, Centro Tecnológico da Marinha em Sao Paulo, Sao Paulo, SP, Brazil; E.C.S. RIGO, DCB, Fac. de Zootecnia e Eng. de Alimentos, Universidade de Sao Paulo, Pirassununga, SP, Brazil, A.H.A. BRESSIANI, J.C. BRESSIANI, CCTM, Instituto de Pesquisas Energéticas e Nucleares, Sao Paulo, SP, Brazil.

FL:P12 **Nanostructured Hydroxyapatite Coatings Produced by Thermal Spray: Synthesis, Deposition and Characterization**
C.P. BERGMANN, R.M. TROMMER, A.S.TAKIMI, J.VICENZI, Federal University of Rio Grande do Sul, Porto Alegre, RS, Brazil

FL:P13 **Surface Parameters of Titanium Samples by Powder Metallurgy**
C. GOMEZ ÁGREDA, T.S. GOIA, J.C. BRESSIANI, A.H.A. BRESSIANI, Instituto de Pesquisas Energéticas e Nucleares, IPEN - CNEN/SP, Brasil

FL:P14 **Osseointegration and Biocompatibility Study of Macroporous Biphasic Calcium Phosphate (BCP) Ceramics Oobtained by Consolidation Using Albumin**
C. RIBEIRO, T.S. GOIA, K.B. VIOLIN, J.C. BRESSIANI, A.H.A. BRESSIANI, Instituto de Pesquisas Energéticas e Nucleares, IPEN - CNEN/SP, Brasil

FL:P15 **Properties of Porous TiNi Shape Memory Alloy Fabricated by SHS at Different Preheating Temperatures**
S. BELYAEV, N. RESNINA, V. MOZGUNOV, A. VORONKOV, A. KRIVOSHEEV, Saint-Petersburg State University, Saint-Petersburg, Russia

FL:P16 **Siloxane-TiO2-CaO Hybrid Materials: Preparation and Characterization**
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FL:P17 **Disperse Materials with Adjustable Curie Temperature for Antitumor Hyperthermia**
M.N. MARKELOVA, A.E. KUSHNIR, A.R. KAUL, Lomonosov Moscow State University, Moscow, Russia; V.V. DEMIDOV, V.A. ATSARKIN, Institute of Radio Eng. and Electronics, RAS, Moscow, Russia; B.M. ODINTSOV, E.J. ROY, University of Illinois at Urbana-Champaign, USA; R.I. YAKUBOVSKAYA, N.I. MOROZOVA, A.A. PANKRATOV, Moscow Hertsen Oncological Institute, RAS, Moscow, Russia

FL:P18 **Influence of Annealing on Physical and Mechanical Properties of Porous TiNi Alloy for Implants**
N. RESNINA, S. BELYAEV, V. MOZGUNOV, A. VORONKOV, I. OSTAPOV, Saint-Petersburg State University, Saint-Petersburg, Russia

FL:P19 **Fatigue of Tetragonal Zirconia Polycrystals (Y-TZP) / Al2O3 Bioceramics**
R.C. SOUZA, C .SANTOS, L.A. BICALHO, M.J.R. BARBOZA, C.A.R.P. BAPTISTA, EEL-USP, Lorena, Sao Paulo, Brazil; **K. STRECKER**, UFSJ, Sao Joao Del-Rei, Minas Gerais, Brazil

FL:P21 **Fiber Optic Capillary Microfluidic Sensor for Biotechnological Applications**
M. BORECKI, Warsaw Univ. of Technology, Warsaw, Poland; **M.L. KORWIN-PAWLOWSKI**, Université du Québec en Outaouais, Gatineau, QC, Canada; M. BEBLOWSKA, J. SZMIDT, Warsaw Univ. of Technology, Warsaw, Poland

FL:P22 **Surface Modified Fe3O4 and Au Nanoparticles Based on Simple Diagnostic System for Tuberculosis Magnetophoretic Immunoassay**
JAEWOOK LEE[1], KWANGNAK KOH[1], DONG-WOOK HAN[1], CHEOL-MIN KIM[2], HWA-JUNG KIM[3], HYUN-CHUL SHIN[4], CHULHUN L. CHANG[2], **JAEBEOM LEE**[1], [1]Dept. of Nanomedical Eng., College of Nanoscience and Nanotechnology, Pusan National University, Miryang, Korea; [2]School of Medicine, Pusan National University, Yangsan, Korea; [3]Dept. of Microbiology and Infection Signaling Network Research Center, College of Medicine, Chungnam National University, Daejeon, Korea: [4]Dept. of Chemistry Education, Korea National University of Education, Cheongwon, Korea

FL:P23 **Differential Cellular Responses to Superparamagnetic Iron Oxide Nanoparticles in Primary Fibroblast vs. Fibroblastic Cell Line**
H.Y. KIM, S.C. HONG, J.H. LEE, J. LEE, D.-W. HAN, College of Nanoscience & Nanotechnology, Pusan National University, Busan, South Korea

FL:P24 **Molecularly Imprinted Solid-phase Extraction of Biochemical Marker**
S. SCORRANO, G. VASAPOLLO, Dept. of Engineering of Innovation, University of Salento, Lecce, Italy

FL:P25 **Investigation of Affinity Interactions with Frustrated Total Internal Reflection Method**
S.A. KRUTOVERTSEV, A.G. BORISOV, O.M. IVANOVA, M.V. CHUPRIN, JSC "Practic-NC", Zelenograd, Moscow, Russia; M.Yu. RUBTSOVA, Moscow State University, Moscow, Russia

FL:P26 **Novel Polyphthalocyanines in Medical Diagnosis: Development of H2O2 Detection**
O.M. IVANOVA, A.V. SHEVCHENKO, S.A. KRUTOVERTSEV, A.E. TARASOVA, JSC "Practic-NC", Zelenograd, Moscow, Russia; A.I. SHERLE, E.F. OLEINIK, Institute of Chemical Physics of RAS, Moscow, Russia

FL:P27 **Preparation and Characterization of Poly(Vinyl Alcohol) Hydrogel Beads as an Injectable Bulking Agent**
SOO JUNG CHOI, C.S. LIM, S.J. KIM, S.H. OH, J.H. LEE, Dept. of Advanced Materials, Hannam University, Daejeon, South Korea

FL:P28 **In Vitro Evaluation of Pore Size Effect on Chondrogenesis of Adipose-derived Stem Cells Using Pore Size Gradient Scaffold**
TAE HO KIM, S.H. OH, J.H. LEE, Dept. of Advanced Materials, Hannam University, Daejeon, South Korea

FL:P29 **Hyaluronic Acid/Alginate Mixture Gel as a Tissue Adhesion Barrier**
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FL:P30 **Effect of Starting Powder and Microstructure on the Aging Process of 3Y-TZP**
M.M. OLIVEIRA, **L.A. GENOVA**, IPEN-CNEN/SP, Sao Paulo, Brazil

FL:P31 **Preparation of Porous Scaffold from PLGA/Hydroxyapatite Composite Coated with a Biodegradable Triblock Copolymer for Bone Tissue Engineering**
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FL:P32 **Functional-designed Nanofiber Coated Drug Eluting Stent for Tracheal Regeneration**
DONG NYOUNG HEO, SUNG EUN KIM, **IL KEUN KWON**, Dept. of Maxilofacial Biomedical Eng., School of Dentistry, Kyung Hee University, Seoul, Korea

FL:P33 **Study on Bone Cell Adaptability of TCP/HAp Functionally Graded Porous Beads for Biomaterials Application**
S. OHTAKE,T. ASAOKA, Tokyo Denki University, Saitama, Japan; K. FURUKAWA, T. USHIDA, University of Tokyo, Japan; T. TATEISHI, NIMS, Japan

FL:P34 **Alginate Microparticles Loaded with Antineoplastic Drugs for the Treatment of Eye Cancer**
E.O. BATYRBEKOV, D.Zh. RAKHIMBAEVA, K.B. MUSABEKOV, B.A. ZHUBANOV, Institute of Chemical Sciences, Kazakh National University, Almaty, Kazakhstan

FL:P35 **Metal Nanoparticles as Bacteria Production Strains' Protective Agents in the Manufacture of Immunobiological Preparations**
M.Ye. ROMAN'KO, National Scientific Center "Institute of Experimental and Clinical Veterinary Medicine" Kharkov, Ukraine; L.S. RIEZNICHENKO, T.G. GRUZINA, Z.R. ULBERG, F.D.Ovcharenko Institute of Biocolloidal Chemistry, Kyiv, Ukraine; V.A. USHKALOV, A.N. GOLOVKO, The State Scientific Control Institute of Biotechnology and Strains of Microorganisms, Kyiv, Ukraine

FL:P36 **Modulation of Biochemical Activity by Gold Nanoparticles In-vitro and In-vivo**
L.S. RIEZNICHENKO, S.N. DYBKOVA, T.G. GRUZINA, Z.R. ULBERG, F.D. Ovcharenko Inst. of Biocolloidal Chemistry, Kyiv, Ukraine; S.I. SHPYLEVA, I.N. TODOR, V.F. CHEKHUN, R.E. Kavetsky Inst. of Experimental Pathology, Oncology and Radiobiology, Kyiv, Ukraine

FL:P37 **Study of Chitosan Addition in the PVP/PVAL Polymeric Blend - A System of Controlled Release of Drugs**
M.C. TERENCE, L.F. DE MIRANDA, **S. BRAUNSTEIN FALDINI**, P.J. DE CASTRO, Universidade Presbiteriana Mackenzie - UPM, Sao Paulo-SP, Dpto de Engenharia de Materiais, Sao Paulo, SP, Brasil

FL:P38 **Evaluation of the Effects of Sustained Delivery Demineralized Bone Matrix (DBM) and Osteogenic Protein-1 (OP-1) on Fracture Healing, Osteoclast Activation in a Rat Femur Model**
M.A. TUCCI, S.A. WINGERTER, H.A. BENGHUZZI, University of Mississippi Medical Center, Jackson, MS, USA

FL:P39 **In Vitro Study of Electrospun Nanofibrous Epigallocatechin Gallate-eluting Anti-adhesion Barrier Composed of Biodegradable Polymer**
JONG HO LEE, H.Y. KIM, D.-W. HAN, College of Nanoscience & Nanotechnology, Pusan National University, Busan, South Korea; J.-C. PARK, Yonsei University College of Medicine, Seoul, South Korea; S.-H. HYON, Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Japan

FL:P40 **Development of Pseudoboehmites for Nanosystems to Release Acyclovir**
A.H. MUNHOZ JR., S. BRAUNSTEIN FALDINI, **R. RODRIGUES RIBEIRO**, C. YUGI MAEDA, L.F. MIRANDA, Universidade Presbiteriana Mackenzie - UPM, Sao Paulo-SP, Brasil

FL:P41 **Release Behaviors from Dual Drug-eluting Stents Coated with Biodegradable Polymers Using Electrospraying**
D.M. KIM[1, 2], B.S. LEE[1], K. PARK[1], J.H. KANG[1], T.I. SON[2], **DONG KEUN HAN**[1], [1]Biomaterials Research Center, Korea Inst. of Science and Technology, Seoul, Korea; [2]Dept. of Biotechnology, Chung-Ang University, Korea

FL:P42 **An Efficient Low-pH Range Sensitive Artificial Muscle for Future Active Implantable Systems**
B. TONDU, S. MATHÉ, N. BARDOU, University of Toulouse, Toulouse, France

FL:P43 **Osseointegration of Macroporous Titanium Alloy Obtained by PM with Addition of Gelatin**
T.S. GOIA, K.B. VIOLIN, M. YOSHIMOTO, J.C. BRESSIANI, A.H.A. BRESSIANI, Instituto de Pesquisas Energéticas e Nucleares, IPEN - CNEN/SP, Brasil