SCIENTIFIC PROGRAMME

CIMTEC 2016

OPENING SESSION

WELCOME ADDRESSES

Plenary Lectures

PL1 **Nanogenerators for Self-powered Sensors and Piezotronics for Smart Systems**
ZHONG LIN WANG, School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, USA

PL2 **Graphene Future Emerging Technology**
A.C. FERRARI, Cambridge Graphene Centre, University of Cambridge, Cambridge, UK

5th International Conference
SMART AND MULTIFUNCTIONAL MATERIALS, STRUCTURES & SYSTEMS

SYMPOSIUM A
STIMULI RESPONSIVE AND MULTIFUNCTIONAL POLYMERS: PROGRESS IN MATERIALS AND APPLICATIONS

Oral Presentations

A:KL **From Stimuli-responsive Polymers to Self-repairable Materials**
M.W. URBAN, Dept. of Materials Science and Engineering, Center for Optical Materials Science and Engineering (COMSET), Clemson University, Clemson, SC, USA

Session A-1
Shape-memory Polymers and Shape-changing Polymers

A-1:IL01 **3D Printed Shape-memory Polymer Foams for Biomedical Applications**
T.S. WILSON, J.N. RODGRIGUEZ, E.B. DUOSS, J.P. LEWICKI, Lawrence Livermore National Laboratory, Livermore, CA, USA; M.K. HEARON, MIT, Cambridge, MA, USA; D.J. MAITLAND, Texas A&M University, College Station, TX, USA

A-1:IL02 **Shape Memory of Micro- and Nano-scale Imprinted Patterns on a Supramolecular Polymer Compound**
Z. ZHAO, Y.S. CHEN, A. KARIM, **R.A. WEISS**, Dept. of Polymer Engineering, University of Akron, Akron, OH, USA

A-1:IL03 **Embolic Applications of Shape Memory Polymer Foams**
D.J. MAITLAND, Texas A&M University, College Station, TX, USA

A-1:IL04 **An External Shape Memory Support to Prevent Vein Failure**
T.C. BOIRE[1], C. GUTH[2], C. BROPHY[2], **HAK-JOON SUNG**[1], [1]Department of Biomedical Engineering, [2]Division of Vascular Surgery, Vanderbilt University, Nashville, TN, USA

A-1:L05 **3D Printed Shape Memory Polymer Biomedical Devices**
M. ZAREK, D. COHN, Casali Center of Applied Chemistry, Institute of Chemistry, Hebrew University of Jerusalem, Jerusalem, Israel

A-1:IL06 **Near Infared Driven Polymer Actuators**
JENNIFER LU, XINYUAN SHEN, YUZE ZENG, Materials Science and Engineering, University of California at Merced, Merced, CA, USA

A-1:L07 **A Thiol-acrylate Main-chain Liquid-crystalline Elastomer Platform for Multifunctional Applications**
C.M. YAKACKI, M.O. SAED, A.H. TORBATI, R.H. VOLPE, M.S. BOLLINGER, University of Colorado Denver, Denver, CO, USA; C.P. FRICK, D.R. MERKEL, University of Wyoming, Laramie, WY, USA

A-1:L08 **Programmed Anisotropy and Heterogeneity of Porous Liquid Crystal Elastomers**
T. WARE, Department of Bioengineering, The University of Texas at Dallas, Richardson, TX, USA

A-1:L09 **Shape Memory Polymers and Stimuli-responsive Methods**
YANJU LIU[1], JINSONG LENG[2], **FENGHUA ZHANG**[2], [1]Department of Astronautical Science and Mechanics, Harbin Institute of Technology (HIT), Harbin, P.R. China; [2]Centre for Composite Materials and Structures, Harbin Institute of Technology (HIT), Harbin, P.R. China

A-1:L10 **Laser Assisted 3D Bioprinting of the Magnetic Polymer Nanocomposites Bbased on Nanoparticles FexOy and SrFe12O18 for Medical Applications**
I. SHISHKOVSKY[1, 2], V. SCHERBAKOV[1], Y. MOROZOV[2], [1]Lebedev Physical Institute (LPI) of Russian Academy of Sciences, Samara branch, Samara, Russia; [2]Institute of Structural Macrokinetics and Materials Science (ISMMS), RAS, Chernogolovka, Russia

A-1:L11 **Characterization of Processing-Microstructure-Property Relationships of a Melt-Blown Shape-Memory Polyurethane Nonwoven using Microcomputed Tomography**
D.L. SAFRANSKI, K.M. DUPONT, J.C. GRIFFIS, MedShape, Inc., A.S. LIN, R.E. GULDBERG, Georgia Institute of Technology, USA

Session A-2
Degradable, Stimuli-sensitive Polymers

A-2:IL01 **Converting Local Signals into Global Responses in Polymeric Materials**
S.T. PHILLIPS, Pennsylvania State University, University Park, PA, USA

A-2:IL02 **Effects of Macromolecular Architecture on the Response of Oxidation-responsive Polymers**
R. D'ARCY, **N. TIRELLI**, University of Manchester, Manchester, UK

A-2:L03 **Adaptable Microstructures**
M. KLEIMAN, K. BRUBAKER, A.P ESSER-KAHN, Department of Chemistry, University of California, Irvine, Irvine, CA, USA

A-2:L04 **Mechanical Characterization of Self-folding Chitosan Film**
A. RATH, S. MATHESAN, P. GHOSH, Indian Institute of Technology Madras, Chennai, India

A-2:IL05 **Dynamic Covalent Crosslinking in Polymer Networks for Materials-healing**
M.B. GORDON, **C.J. KLOXIN**, Dept. of Materials Science and Engineering, Dept. of Chemical and Biomolecular Engineering, University of Delaware, Newark, DE, USA

A-2:IL06 **Biobased Polymer Systems with Multifunctionality**
A. LENDLEIN, Institute of Biomaterial Science and Berlin-Brandenburg Centre for Regenerative Therapies (BCRT), Helmholtz-Zentrum Geesthacht, Teltow, Germany, and University of Potsdam, Potsdam, Germany

Session A-3
Stimuli-sensitive Gels

A-3:IL01 **Stimuli-responsive DNA Hydrogels: Switchable Materials and Interfaces and their Applications**
I. WILLNER, Institute of Chemistry, The Hebrew University of Jerusalem, Jerusalem, Israel

A-3:IL02 **Large Cilia Arrays of Multi-responsive Gels: Bulk Properties and Limits to Miniaturization**
E. MENDES, P. GLAZER, Dept. of Chemical Engineering, Delft University of Technology, Delft, The Netherlands; H. AN, Eastman, Kingsport, TN, USA

A-3:IL03 **Design and Applications of Self-folding Hydrogel Microstructures**
D. GRACIAS, Johns Hopkins University, Baltimore, MD, USA

A-3:IL04 **Injectable and Stimuli-responsive Block Copolymer Hydrogels**
DOO SUNG LEE, Theranostic Macromolecules Research Center, School of Chemical Engineering, Sungkyunkwan University, Suwon, Gyeonggi-do, South Korea

A-3:IL05 **Evolution of Self-oscillating Polymer Gels: Functional Control from Nanosize to Bulk Range**
R. YOSHIDA, The University of Tokyo, Tokyo, Japan

A-3:IL06 **Redox Responsive Organometallic Hydrogels as Metal Nanoparticle Foundry**
G.J. VANCSO, XUELING FENG, JING SONG*, XIAOFENG SUI, BRAM ZOETEBIER, MARK A. HEMPENIUS, Department of Materials Science and Technology of Polymers, MESA+ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands; *Institute for Materials Research and Engineering, A*STAR, Singapore

A-3:IL07 **Stimuli-sensitive (Glyco-) Polypeptide Based Polymers and Gels**
H. SCHLAAD, University of Potsdam, Institute of Chemistry, Potsdam, Germany; K.-S. KRANNIG, C.D. VACOGNE, Max Planck Institute of Colloids and Interfaces, Colloid Chemistry, Potsdam, Germany

Session A-4
Multifunctional (Nano)composites and Multi-material Systems

A-4:IL01 **Bio-inspired Design of Organic-inorganic Nanocomposites for Applications in Regenerative Medicine**
R. NEJADNIK, H. WANG, M. DIBA, **S.C.G. LEEUWENBURGH**, Radboud University Medical Center, Department of Biomaterials, Nijmegen, The Netherlands

A-4:L02 **Light and Heat Induced Patterning of Silver Nanoparticle/Polymer Nanocomposites**
J. MARQUES-HUESO, D.E. WATSON, M.P.Y. DESMULLIEZ, Heriot-Watt University, School of Engineering & Physical Sciences (EPS), Institute of Signals, Sensors and Systems, Microsystems Engineering Centre (MISEC), Edinburgh, Scotland, UK

A-4:L03 **Spatiotemporal Control of Self-oscillating Gel by Uniformly Aligned Inorganic Nano Sheets**
YOUN SOO KIM[1], Y. ISHIDA[2], Y. EBINA[3], T. SASAKI[3], R. YOSHIDA[1], T. AIDA[1], [1]School of Engineering, The University of Tokyo, Tokyo, Japan; [2]RIKEN Center for Emergent Matter Science, Saitama, Japan; [3]National Institute for Materials Science, International Center for Materials Nanoarchitectonics, Tsukuba, Ibaraki, Japan

A-4:IL04 **New Developments in Advanced Polybenzoxazine Thermosets and Related Nanocomposites**
L. DUMAS, L. BONNAUD, M. POORTEMAN, M. OLIVIER, **Ph. DUBOIS**, Materia Nova Research Center & University of Mons UMONS, Mons, Belgium

A-4:IL05 **Nanobiomaterials Enabling Low Dose Bioimaging Diagnosis and Stem Cell Therapies of Vascular Disease**
HYUNJOON KONG, Chemical & Biomolecular Engineering/Bioengineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA

A-4:L06 **Green Source Based Carbon Nano Rods for Developing the Quantum Resistive Vapor Sensors to Detect Cancer Biomarkers**
A. SACHAN, K.M. TRIPATHI, M. CASTRO, J.F. FELLER, Smart Plastics Group, European University of Brittany (UEB), LIMATB-UBS, Lorient, France; V. CHOUDHARY, Centre for Polymer Science & Engineering, Indian Institute of Technology, Delhi, India

A-4:L07 **The Effects of External Magnetic Field on Polymeric Foam-ferromagnet Composites**
M. D'AURIA[1, 2], V. VOLPE[3], D. DAVINO[2], R. PANTANI[3], L. SORRENTINO[1], [1]Istituto per i Polimeri, Compositi e Biomateriali, Consiglio Nazionale delle Ricerche, Portici (NA), Italy; [2]Dipartimento di Ingegneria, Università degli Studi del Sannio, Benevento, Italy; [3]Dipartimento di Ingegneria Industriale, Università di Salerno, Fisciano (SA), Italy

A-4:L08 **Ferrofluids and Magnetic Nanocomposites: Tailoring the Properties for Applications**
R. TURCU[1], C. VASILESCU[2], I. CRACIUNESCU[1], D. SUSAN-RESIGA[2], T.BORBATH[3], I. BORBATH[3], V. SOCOLIUC[2], V. HARAMUS[4], **L. VEKAS**[2], [1]National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania; [2]Romanian Academy-Timisoara Branch, Center for Fundamental and Advanced Technical Research, Lab. Magnetic Fluids, Timisoara, Romania; [3]S.C. ROSEAL S.A., Odorheiu Secuiesc, Romania; [4]Helmholtz-Zentrum Geesthacht, Zentrum für Material- und Küstenforschung GmbH, Geesthacht, Germany

A-4:IL09 **3-D Templates for Hierarchical Device Structures**
J.J. WATKINS, University of Massachsuetts, Amherst, MA USA

Session A-5
Multifunctional Surfaces

A-5:IL01 **Block Copolymers at Interfaces – Statics, Kinetics and Rheology**
L. LAUFER, M. ARMON, **M. GOTTLIEB**, Chemical Engineering Department, Ben Gurion University, Beer Sheva, Israel

A-5:L02 **Self-healing Fluoropolymer Brushes as Anti-fouling Coatings**
ZHANHUA WANG, H. ZUILHOF, Wageningen University, Wageningen, The Netherlands

A-5:L03 **Self-assembled Nanotubes and Nanoparticles with Multi-functional Stimuli-responsive Surfaces**
JEONGHUN LEE, **CHULHEE KIM**, Polymer Science and Engineering, Inha University, Incheon, Korea

A-5:L04 **Smart Surfaces for Directing Nanoparticle Formation**
N. YONET-TANYERI, Department of Biomedical Engineering, Istanbul Medipol University, Istanbul, Turkey; P.V. BRAUN, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA

A-5:IL05 **Interplay of Morphology and Degradation in Two-dimensional Polymer Films at the Air-water Interface**
B. SCHULZ, A.-C. SCHOENE, A. LENDLEIN, University of Potsdam, Institute of Chemistry, Potsdam, Germany; and Institute Biomaterial Science and Berlin-Brandenburg Centre for Regenerative Therapies (BCRT), Teltow, Germany

A-5:L06 **Optically Tunable Mechanical and Functional Properties of Azo-polymer Thin Films**
F. FABBRI[1], L. SORELLI[2], D.-V. AHN[3], J. FRECH-BARONET[2], M. FAFARD[2], Y. LASSAILLY[3], K. LAHIL[3], L. MARTINELLI[3], T. GACOIN[3], J. PERETTI[3], [1]Institut d'Electronique Fondamentale, Université Paris-Sud/CNRS, Orsay, France; [2]Département de Génie Civil, Université Laval, Québec, Canada; [3]Laboratoire de Physique de la Matière Condensée, Ecole Polytechnique/CNRS, Palaiseau, France

A-5:L07 **Synthesis of Transparent Thin Films for UV/IR Shielding**
SHU YIN, MIKIHIKO KOBAYASHI, XIAOYONG WU, TSUGIO SATO, IMRAM, Tohoku University, Sendai, Miyagi, Japan

Session A-6

Multifunctional Polymer Systems for Energy Storage and Flexible Electronics

A-6:IL01 **Carbon Nanotube Fibre Microelectrodes**
P. POULIN, Centre de Recherche Paul Pascal - CNRS Université de Bordeaux, Pessac, France

A-6:L02 **Multilayer Hybrid Nanocomposites for Supercapacitor Electrodes**
M. RE, M.F. DE RICCARDIS, D. CARBONE, L. CAPODIECI, Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Dept. SSPT, Div. PROMAS, Lab. MATAS, Brindisi, Italy

A-6:IL03 **Soft Matter Containing Ionic Liquid as Solvent**
MASAYOSHI WATANABE, Yokohama National University Yokohama, Japan

A-6:L04 **Electroactive Polymer Based Conducting, Magnetic, and Luminescent Triple Composites**
A.V. KUKHTA, A.G. PADDUBSKAYA, P.P. KUZHIR, S.A. MAKSIMENKO, Research Institute for Nuclear Problems, Belarusian State University, Minsk, Belarus; S.A. VOROBYOVA, Research Institute for Physical and Chemical Problems, Belarusian State University, Minsk, Belarus; S. BELLUCCI, National Institute of Nuclear Physics, Frascati National Laboratory, Frascati, Italy; P.K. KHANNA, Defense Institute of Advanced Technology, Deemed University, Pune, India

A-6:L05 **Conductive Polymer Nanocomposites for Impact Resilient Electronics**
S. GANGULI, A.K. ROY, J. FOLEY, C. CHEN, Airforce Research Laboratory, Materials and Manufacturing Directorate, WPAFB, Dayton, OH, USA

Session A-7

Pharmaceutical and Medical Applications of Smart Polymers

A-7:IL01 **Nano and Macro-sized "Smart" Biomedical Structures: Design and Performance**
D. COHN, Casali Center of Applied Chemistry, Institute of Chemistry The Hebrew University of Jerusalem, Jerusalem, Israel

A-7:IL02 **Medical Applications of Nature-inspired Adhesive Polymers**
HAESHIN LEE, Department of Chemistry, Korea Advanced Institute of Science & Technology, South Korea

A-7:IL03 **Engineering Citrate-based Macromolecules to Regenerate Tissue Function**
G. AMEER, Northwestern University, Evanston, IL, USA

A-7:L04 **Cold Plasma Reticulation of Shape Memory Polymer Embolic Tissue Scaffolds**
L.D. NASH, N.C. RIVERA, K.P. EZELL, J.K. CARROW, S.M. HASAN, A.K. GAHARWAR, D.J. MAITLAND, Texas A&M University, College Station, TX, USA

A-7:L05 **A Bioactive "Self-fitting" Shape Memory Polymer (SMP) Scaffold to Treat Craniomaxillofacial (CMF) Bone Defects**
M.A. GRUNLAN[1,2], DAWEI ZHANG[1], M.S. HAHN[3], J.E. MARINO[3], [1]Texas A&M University, Department of Biomedical Engineering, [2]Texas A&M University, Department of Materials Science and Engineering, [3]Rensselaer Polytechnic Institute, Department of Biomedical Engineering, College Station, TX, USA

A-7:L06 **Shape-memory Mediated Self-healing Polymers**
G. BAGHDACHI, M. GARAY, K. MARTENIS, O. ALIYEV, Coatings Research Institute, Eastern Michigan University, Ypsilanti, MI, USA

A-7:IL07 **Multifunctional Polycationic Gene Carriers for Endothelialization**
YAKAI FENG, JING YANG, QIAN LI, XUEFANG HAO, School of Chemical Engineering and Technology, Tianjin University, Tianjin, P.R. China

Poster Presentations

A:P01 **Surface-relief Formation in Azo-polyelectrolyte Layers with a Protective Polymer Coating**
F. FRASCELLA, A. ANGELINI, S. RICCIARDI, F. PIRANI, F. PIRRI, E. DESCROVI, Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy

A:P02 **The Reversible Shape-memory Behavior of Crosslinked Poly(ε-caprolactone) under Stress and Stress-free Conditions**
O. DOLYNCHUK, Leibniz-Institut für Polymerforschung Dresden e.V., Dresden, Germany; I. KOLESOV, Martin Luther University Halle-Wittenberg, Center of Engineering Sciences, Hale (Saale), Germany, Polymer Service GmbH Merseburg, Merseburg, Germany; D. JEHNICHEN, Leibniz-Institut für Polymerforschung Dresden e.V., Dresden, Germany; H.-J. RADUSCH, Polymer Service GmbH Merseburg, Merseburg, Germany

A:P03 **Production Methods and the Materials Ratio Effect on the Mechanical Properties of Bamboo-plastic Waste Hybrid Composites for Structural Applications**
D.R. AKWADA, E.T. AKINLABI, Department of Mechanical Engineering Science, University of Johannesburg, South Africa

A:P04 **Nanostructure Provides a Major Breakthrough in Properties of Transparent Polymer, and Solar Cells, which are Encapsulated by Nanopolymer**
E. SHEMBEL, V. REDKO, N. KLYUI, L. YASHCHENKO, N. YAROVA, Enerize Corporation, FL, USA

A:P05 **Nanocomposites Spray Quantum Resisitve Sensors (sQRS) for Structural Health Monitoring of Composite Wind Blades**
A. LEMARTINEL, M. CASTRO, J.F. FELLER, Smart Plastics Group, Université Européenne of Bretagne (UEB), LIMATB-UBS, Lorient, France; J. DE LUCA, Institut de Recherche Technologique Jules Verne, Bouguenais, France

A:P06 **Poly(N,N-dimethylacrylamide-co-3,9-Divinyl-2,4,8,10-tetraoxaspiro[5.5] undecane) Network with Pendant Spiroacetal Moieties and pH and Temperature Sensitivity**
A.P. CHIRIAC, V. BALAN, M. ASANDULESA, E. BUTNARU, N. TUDORACHI, E. STOLERU, L.E. NITA, I. NEAMTU, A. DIACONU, "Petru Poni" Institute of Macromolecular Chemistry, Iasi, Romania

A:P07 **Interpenetrated System Between Poly(aspartic acid) and Pluronic F127 by Self-assembling Process**
L.E. NITA, A.P. CHIRIAC, M.T. NISTOR, M. BERCEA, "Petru Poni" Institute of Macromolecular Chemistry, Iasi, Romania

A:P08 **Controllable Shape Memory Behavior Actuated by Selective Stimuli**
WENBING LI, JINSONG LENG, Centre for Composite Materials and Structures, Harbin Institute of Technology (HIT), Harbin, PR China; YANJU LIU, Department of Astronautical Science and Mechanics, Harbin Institute of Technology (HIT), Harbin, PR China

A:P09 **Flexible Strain Sensors with Stretchable Electrodes**
TAKAHIRO KONDO, M. SATO, H. OKUZAKI, University of Yamanashi, Kofu, Yamanashi, Japan

A:P10 **Nanocomposites of Aged Pseudoboehmite with Nylon 6,12**
A.L. NASCIMENTO, A.H. MUNHOZ JR., C. DENUZZO, G.C. GOMES, L.F. MIRANDA, M.V. ROSSI, University Presbyterian Mackenzie, São Paulo, SP, Brazil

A:P11 **Study of the Piezoresistive Effect of Nanocomposites for e-skin**
A. VERCIK, University of Sao Paulo, FZEA/ZAB Pirassununga - SP, Brazil

A:P12 **Influence of Concentration of the Nanofiller Pseudoboehmite in Thermal and Mechanical Properties in Polystyrene Compounds**
L.F. DE MIRANDA, A.H. MUNHOZ Jr., T.J. MASSON, M.V. ROSSI, Universidade Presbiteriana Mackenzie, Sao Paulo, Brazil

A:P13 **Effect of Al2O3 Nano Filler on Conductivity and Optical Properties of PEI-Based Composite Polymer Electrolytes for Electrochromic Windows**
O. SAKARYA[1], **S. KURAMA**[2], G. GUNKAYA[3], [1]Anadolu University, Faculty of Engineering, Dept. of Materials Science and Engineering, Eskisehir, Turkey; [2]Anadolu University, Faculty of Aeronautics and Astronautics, Eskisehir, Turkey; [3]Anadolu University, Faculty of Fine Arts, Dept. of Ceramic and Glass, Eskisehir, Turkey

A:P14 **Preparation and Characterization of Poly(maleic anhydride-co-3, 9-divinyl-2, 4, 8, 10-tetraoxaspiro [5.5] undecane)-Coated Magnetite Nanoparticles as a Potential Magnetic Responsive Biomaterial**
I. NEAMTU, A.P. CHIRIAC, L.E. NITA, V. BALAN, A. DIACONU, L. TARTAU, "Petru Poni" Institute of Macromolecular Chemistry, Iasi, ROMANIA

A:P15 **Simulation of Optical Properties of Multimaterial Systems with Optically Anisotropic Materials**
V.V. BELYAEV, A.S. SOLOMATIN, Moscow Region State University, Moscow, Russian Federation

A:P16 **Liquid Crystals Sensor Applications Based on their Dielectric Properties**
D.N. CHAUSOV[1], V.V. BELYAEV[1], A.D. KURILOV[1], A.S. SOLOMATIN[1], D.O. RYBAKOV[1], A.A. MURAUSKI[2], A.A. MURAVSKY[2], [1]Moscow Region State University, Russian Federation; [2]Institute of Chemistry of New Materials NAS Belarus, Belarus

A:P17 **Bonding Enhancement by Plasma Irradiation in Laminated Foil Structures of Polymer-polymer, Polymer-metal or Polymer-carbon Fibers**
K. ENDO, Kanazawa Inst. Tech., Hakusan, Ishikawa, Japan; M. YOKURA, APC Co., Otsu, Shiga, Japan; P. BADICA, National Inst. Mater. Phys., Magurele, Romania

A:P18 **Oriented Extrusion Processed Ferroelectric Poly (vinylidene fluoride)/ Poly (vinylidene fluoride -trifluoroethylene) Blended Films with Strong Interactions**
NAN MENG, XIAOJING ZHU, R.M. WILSON, M.J. REECE, E. BILOTTI, Queen Mary, University of London, London, UK

A:P19 **Site-specific Photo-rewritable Surfaces**
LEI LI, X. DU, W.Q. FENG, P.A. LEVKIN, Institute of Toxicology and Genetics, Karlsruhe Institute of Technology, Karlsruhe, Germany

A:P20 **All-organic Supercapacitors Using PEDOT/PSS Flexible Electrodes**
HARUKI SAITO, H. TAKEZAWA, H. OKUZAKI, University of Yamanashi, Kofu, Yamanashi, Japan

A:P21 **Fabrication of Cellulose and Silica Nanoparticle-reinforced Polyvinyl Alcohol Hydrogels**
C.A.M. CARATING, R.N.M. ROSALES, **E.R. MAGDALUYO Jr.**, Department of Mining, Metallurgical and Materials Engineering, College of Engineering, University of the Philippines, Quezon City, Philippines

A:P22 **Novel Polymeric Azaporphines for Oxidative Stress Detection**
S.A. KRUTOVERTSEV, O.M. IVANOVA, L.S. KRUTOVERTSEVA, A.E. TARASOVA, JSC "Ecological sensors and systems", Zelenograd, Moscow, Russia; E.F. OLEINIK, A.I. SHERLE, Institute of Chemical Physics of RAS, Moscow, Russia

A:P23 **Fabrication and Properties of Naproxen Transdermal Patches Using Deproteinized Natural Rubber for Electric Field Controlled Drug Delivery**
R. KAEWCHINGDUANG, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

A:P24 **Fabrication of Nanostructure Conducting Polymer-alginate Hydrogel Composites for Iontophoresis Transdermal Drug Delivery**
N. PARADEE, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

A:P25 **Shape Memory Polymer Stent with Photosensitivity and pH Responsive Hybrid Nanoparticles for Colorectal Cancer Therapy**
SHUN YU HSIEH[1], H.C. WU[2], W.H. HU[3], C.C. HUANG[4], T.W. WANG[1], [1]Dept. of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan; Dept. of Material Engineering, Tatung University, Taipei, Taiwan; [3]Dept. of Internal Medicine, National Taiwan University Hospital-Hsinchu Branch, Hsinchu, Taiwan; [4]Dept. of Surgery, National Taiwan University Hospital-Hsinchu Branch, Hsinchu, Taiwan

SYMPOSIUM B
STATE-OF-THE-ART RESEARCH AND APPLICATIONS OF SHAPE MEMORY ALLOYS

Oral Presentations

Session B-1
Materials and Materials Design

B-1:IL01 **Strain Glass as A New Class of Smart Materials**
XIAOBING REN, Ferroic Physics Group, National Institute for Materials Science, Tsukuba, Japan; and Multi-disciplinary Materials Research Center, Frontier Institute of Science and Technology, Xi'an Jiaotong University, Xi'an, China

B-1:IL02 **High temperature SMA**
A. LUDWIG, Inst. für Werkstoffe / Werkstoffe der Mikrotechnik (ICFO/03/225), Fakultät für Maschinenbau & Materials Research, Dept. Ruhr-Universität Bochum, Bochum, Germany

B-1:IL03 **Hierarchical Twin Microstructure and Consequence for High Mobility of Twin Boundaries**
O. HECZKO, Institute of Physics, Academy of Science of the Czech Republic, Prague, Czech Republic; H. SEINER, Institute of Thermomechanics, Academy of Sciences of Czech Republic, Prague, Czech Republic; S. FAEHLER, IFW Dresden, Dresden, Germany

B-1:IL04 **Magnetic Shape Memory Effect in Non-Modulated Ni-Mn-Ga-based Martensite**
A. SOZINOV, N. LANSKA, K. ULLAKKO, Lappeenranta University of Technology, Material Physics Laboratory, Savonlinna, Finland

B-1:L05 **Role of Interstitial Oxygen Atom on Martensitic Transformation of Ti-Nb Alloy**
M. TAHARA, T. INAMURA, H. HOSODA, Tokyo Institute of Technology, Yokohama, Kanagawa, Japan; H.Y. KIM, S. MIYAZAKI, University of Tsukuba, Tsukuba, Ibaraki, Japan

B-1:L06 **Bulk and Surface Properties of Ti-Nb-based Superelastic Implant Materials**
Yu. ZHUKOVA, S. DUBINSKIY, V. SHEREMETYEV, YU. PUSTOV, M. FILONOV, M. PETRZHIK, S. PROKOSHKIN, National University of Science and Technology "MISiS", Moscow, Russia; V. BRAILOVSKI, Ecole de technologie superieure, Montreal, Canada

Session B-2
Basic Phenomena and Theory

B-2:IL01 **First-principles and Monte Carlo Studies of Magnetocaloric Effects**
P. ENTEL, University of Duisburg-Essen, Faculty of Physics and CENIDE, Duisburg, Germany

B-2:IL02 **Phase Diagrams and Physical Properties of Ferromagnetic Shape Memory Heusler Alloys**
R.Y. UMETSU[1], XIAO XU[2], RYOSUKE KAINUMA[2], [1]Institute for Materials Research, Tohoku University, Japan; [2]Department of Materials Science, Graduate School of Engineering, Tohoku University, Japan

B-2:IL03 **Magnetic Shape Memory Materials: Martensitic Structures and Transformation Behaviour**
L. RIGHI, Department of Chemistry, University of Parma, Parma, Italy; A. CAKIR, M. ACET, Faculty of Physics and Center for Nanointegration (CENIDE), Universitaet Duisburg-Essen, Duisburg, Germany; S. FABBRICI, F. ALBERTINI, IMEM-CNR, Parma, Italy

B-2:IL04 **Magnetic Shape Memory Alloys: Lattice and Volume Instabilities**
V.A. CHERNENKO, BCMaterials & University of Basque Country (UPV/EHU), Bilbao, Spain; and Ikerbasque, Basque Foundation for Science, Bilbao, Spain

B-2:IL05 **Avalanche Criticality in Martenitic Transformations: An Acoustic Emission Study**
A. PLANES, Departament d'Estructura i Constituents de la Matèria, Facultat de Física, Universitat de Barcelona, Barcelona, Catalonia, Spain

B-2:L06 **High Mobility of Twin Interfaces in Ni-Mn-Ga at Ultrasonic Frequencies**
H. SEINER, P. SEDLAK, M. LANDA, Institute of Thermomechanics, Czech Academy of Sciences, Prague, Czech Republic; V. KOPECKY, O. HECZKO, Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic

B-2:L07 **Elastic Anisotropy of Polycrystalline Martensite of NiTi-based Alloys**
P. SEDLAK, M. THOMASOVA, H. SEINER, M. FROST, M. SEVCIK, M. LANDA, Institute of Thermomechanics of the CAS, Prague, Czech Republic

B-2:L08 **Isothermal B2 - B19' Martensitic Yransformation in TiNi-based Shape Memory Alloy**
N. RESNINA, S. BELYAEV, Saint Petersburg State University, Saint Petersburg, Russia; A. SHELYAKOV, National Research Nuclear University "MEPhI" (Moscow Engineering Physics Institute), Moscow, Russia

B-2:L10 **Elasticity of Fe-Pd Single Crystals Under Unidirectional Prestress**
M. LANDA, P. STOKLASOVÁ, H. SEINER, P. SEDLÁK, M. JANOVSKÁ, Institute of Thermomechanics, Czech Academy of Sciences, Prague, Czech Republic; T. FUKUDA, T. YAMAGUCHI, T. KAKESHITA, Dept. of Materials Science and Engineering, Graduate School of Eng., Osaka University, Suita, Osaka, Japan

B-2:IL11 **The Magnetovolume Transition of LaFe11.8Si1.2 as a Model System to Understand the Influence of Volume Expansion on Hysteresis During First Order Phase Transitions**
A. WASKE[1], A. FUNK[1], B. WEISE[1], A. RACK[2], S. FÄHLER[1], [1]IFW Dresden, Germany, [2]ESRF Grenoble, France

B-2:L12 **Localization of Phase Transformation in NiTi Shape Memory Alloy Studied by the Finite Element Method Employing a Nonlocal Averaging Technique**
M. FROST, P. SEDLAK, Institute of Thermomechanics, CAS, Prague, Czech Republic; P. SEDMAK, L. HELLER, P. SITTNER, Institute of Physics, CAS, Prague, Czech Republic

Session B-3
Functional Properties

B-3:IL01 **Caloric and Multicaloric Effects in Ferroic and Multiferroic Materials**
L. MANOSA, Dept. ECM. Facultat de Física. Universitat de Barcelona, Barcelona, Spain

B-3:IL02 **Heusler Alloys for Solid State Refrigeration**
O. GUTFLEISCH, T. GOTTSCHALL, S. ENER, K. SKOKOV, TU Darmstadt, Materialwissenschaft, Darmstadt, Germany

B-3:L03 **Magnetostructural Coupling and Magnetocaloric Effect in Ni-Mn-Ga-Cu Microwires**
X.X. ZHANG, M.F. QIAN, H.H. ZHANG, L. GENG, J.F. SUN, School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China

B-3:IL04 **Elastocaloric Effect in an Iron-Palladium Shape Memory Alloy**
TOMOYUKI KAKESHITA, FEI XIAO, TAKASHI FUKUDA, Osaka University, Suita, Osaka, Japan

B-3:IL05 **Functional Fatigue of Elastocaloric NiTiCu-based Thin Films**
C. CHLUBA[1], WENWEI GE[2], R. LIMA DE MIRANDA[1], J. STROBEL[1], L. KIENLE[1], M. WUTTIG[2], **E. QUANDT**[1], [1]Institute for Materials Science, Faculty of Engineering, University of Kiel, Germany; [2]Department of Materials Science and Engineering, University of Maryland, USA

B-3:L06 **Effects of Pseudoelastic Cycling under Different Temperatures on Physical and Mechanical Properties of a NiTi Alloy**
M.C.M. RODRIGUES, G.C. SOARES, V.T.L. BUONO, **L.A. SANTOS**, Department of Metallurgical and Materials Engineering, Universidade Federal de Minas Gerais, Belo Horizonte-MG, Brazil

B-3:IL07 **Mechanical Behaviour, Shape Memory Effect and Micro-structures of Ti-based Shape Memory Alloys**
SHUICHI MIYAZAKI, HEE YOUNG KIM, Division of Materials Science, University of Tsukuba, Tsukuba, Ibaraki, Japan

B-3:IL08 **Surface Modification of NiTi Shape Memory Alloy by Hafnium Ion Implantation**
YAN LI, T.T. ZHAO, School of Materials Science and Engineering, Beihang University, Beijing, China

B-3:L09 **Thermo-mechanical Properties of NiTi Alloy after High Strain Rate Tension and Compression**
V. GRIGORIEVA, E. OSTROPIKO, **A. RAZOV**, Saint-Petersburg State University, Saint-Petersburg, Russia; A. MOTORIN, Saint-Petersburg National Research University of Information Technologies, Mechanics and Optics, Saint-Petersburg, Russia

B-3:L10 **Structural Modifications Promoted by Training Treatment on Superelastic NiTi Orthodontic Wires**
A. MOTTA STREVA, **A. DOS SANTOS PAULA**[1, 2], P. FREITAS RODRIGUES[3], S. BAPTISTA RIBEIRO[4], S. BRINCO DINIZ[1], F.M. BRAZ FERNANDES[3], L.F. DA CRUZ[1], C. NELSON ELIAS[1], [1]Departamento de Engenharia Mecânica e de Materiais (SE/4), Instituto Militar de Engenharia (IME), Rio de Janeiro, RJ, Brazil; [2]Programa de Pós-graduação em Engenharia Metalúrgica (PPGEM), Universidade Federal Fluminense (UFF), Volta Redonda, RJ, Brazil; [3]Centro de Investigação de Materiais (Cenimat/i3N), Faculdade de Ciência e Tecnologia (FCT), Universidade Nova de Lisboa (UNL), Caparica, Portugal; [4]Centro Universitário de Volta Redonda (UniFOA), Volta Redonda, RJ, Brazil

B-3:IL11 **Microstructural Evaluation of NiMnGa Ferromagnetic Shape Memory Alloy Particles Embedded in Polymer Using X-ray Computed Tomography**
H. HOSODA, H. KAWABE, P. SRATONGON, T. INAMURA, Precision and Intelligence Laboratory, Tokyo Institute of Technology, Yokohama, Japan; V.A. CHERNENKO, BCMaterials & Dpto de Electricidad y Electronica, Universidad del Pais Vasco UPV/EHU, Bilbao, Spain, Ikerbasque, Basque Foundation for Science, Bilbao, Spain

B-3:L12 **Superelasticity and Shape Memory Effect in Laser Welded NiTi Shape Memory Alloys**
J.P. OLIVEIRA, F.M. BRAZ FERNANDES, CENIMAT/I3N, Faculdade de Ciência e Tecnologias, Universidade Nova de Lisboa, Portugal; R.M. MIRANDA, UNIDEMI, Faculdade de Ciência e Tecnologias, Universidade Nova de Lisboa, Portugal

B-3:L13 **Functional Degradation in Novel Shape Memory Alloys: On the Role of Dislocation Formation and Diffusion During Thermomechanical Cycling**
P. KROOSS[1], M. VOLLMER[1], P.M. KADLETZ[2], C. SOMSEN[3], Y.I. CHUMLYAKOV[4], H.J. MAIER[5], T. NIENDORF[6], [1]Institut für Werkstofftechnik, TU Bergakademie Freiberg, Freiberg, Germany; [2]Applied Crystallography, Dept. of Earth and Environmental Sciences, Ludwig Maximilians Universität, Munich, Germany; [3]Institut für Werkstoffe, Ruhr-Universität Bochum, Bochum, Germany; [4]Tomsk State University, Siberian Physical Technical Institute, Tomsk, Russia; [5]Institut für Werkstoffkunde, Leibniz Universität Hannover, Garbsen, Germany; [6]Institut für Werkstofftechnik, Metallische Werkstoffe, Universität Kassel, Kassel, Germany

B-3:L14 **Functional Properties and Structure of Ti-Ni SMA After Multi-Axial Isothermal Quasi-continuous Deformation**
I.Yu. KHMELEVSKAYA[1], V.S. KOMAROV[1], R. KAWALLA[2], S.D. PROKOSHKIN[1], G. KORPALA[2], [1]NUST"MISIS", Moscow, Russia; [2]Freiberg University of Technology and Mining, Germany

B-3:L15 **A Large Elastic Deformation of a Partly Ordered Iron-Platinum Shape Memory Alloy**
T. YAMAGUCHI, T. FUKUDA, T. KAKESHITA, Osaka University, Suita, Osaka, Japan

Session B-4
Thin Films and Micro Nano-systems

B-4:IL01 **Elastocaloric Microcooling: From Basic Effects to Miniature Cooling Devices**
M. KOHL[1], H. OSSMER[1], C. CHLUBA[2], E. QUANDT[2], [1]Karlsruhe Institute of Technology, IMT, Karlsruhe, Germany; [2]University of Kiel, IMS, Kiel, Germany

B-4:IL02 **Multicaloric Effects in Mn-Ga-Co Films on Ferroelectric Substrates**
B. SCHLEICHER[1,2], R. NIEMANN[1,2], S. SCHWABE[1], A. DIESTEL[1], A. WASKE[1], R. HÜHNE[1], P. WALTER[3,4], L. SCHULTZ[1,2], **S. FÄHLER**[1,2], [1]IFW Dresden, Dresden, Germany; [2]TU Dresden, Institute for Solid State Physics, Dresden, Germany; [3]Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany; [4]2nd Institute of Physics B and JARA-FIT, RWTH Aachen University, Aachen, Germany

B-4:IL03 **Giant Inverse Magnetocaloric Effect of NiCoMnAl Films**
N. TEICHERT, L. HELMICH, **A. HÜTTEN**, Department of Physics, Bielefeld University, Bielefeld, Germany

B-4:IL04 **Size Effects and Orientation Dependence in Superelastic Cu-Zn-Al Micro/Nano-pillars**
J. FORNELL, Department of Materials Science and Engineering, MIT, Cambridge, MA, USA and Departament de Física, Facultat de Ciències, Universitat Autònoma de Barcelona, Bellaterra, Spain, N.TUNCER, C.A. SCHUH, Department of Materials Science and Engineering, MIT, Cambridge, MA, USA

B-4:L05 **High Temperature Ti-Ni-Pd Shape Memory Alloys Subjected to High Pressure Torsion**
S. TULIĆ, M. KERBER, A. PANIGRAHI, **T. WAITZ**, University of Vienna, Faculty of Physics, Physics of Nanostructured Materials, Vienna, Austria; MITSUHIRO MATSUDA, Kumamoto University, Department of Materials Science and Engineering, Kumamoto, Japan

B-4:IL06 **Microstructure – Functional Property Relationships of NiTi Filaments**
J. PILCH, O. TYC, P. SITTNER, L. KADERAVEK, L. HELLER, Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic; J.E. SCHAFFER, Fort Wayne Metals Research Products Corp, Fort Wayne, IN, USA; J. STRASKA, K. HORVATH, Faculty of Mathematics and Physics, Charles University in Prague, Czech Republic; P. BUBLIKOVA, Research Centre Rez, Husinec-Rez, Czech Republic; P. STRUNZ, V. RYUKHTIN, Nuclear Physics Institute, Husinec-Rez, Czech Republic; B. MALARD, CIRIMAT, Toulouse, France; R. DELVILLE, SCK•CEN, Mol, Belgium

B-4:IL07 **Nucleation and Growth of Martensite by In-situ Experiments**
R. NIEMANN[1,2], A. DIESTEL[1], B. SCHLEICHER[1,2], S. KAUFFMANN-WEISS[1*], C. BEHLER[1,2], A. BACKEN[1**], U.K. RÖSSLER[1], H. SEINER[3], O. HECZKO[4], S. HAHN[5], M.F.-X. WAGNER[5], L. SCHULTZ[1,2], S. FÄHLER[1,2], [1]IFW Dresden, Dresden, Germany; [2]Technische Universität Dresden, Dept. of Physics, Institute for Solid State Physics, Dresden, Germany; [3]Institute of Thermomechanics, Academy of Sciences of Czech Republic, Prague, Czech Republic; [4]Institute of Physics, Academy of Science of the Czech Republic, Prague, Czech Republic; [5]Technische Universität Chemnitz, Institute of Materials Science and Engineering, Chemnitz, Germany; *now at KIT, Karlsruhe, Germany; **now at CNRS, Grenoble, France

B-4:IL08 **Shape Memory and Superelasticity in SMA at Micro and Nano scale**
J. SAN JUAN[1], J.F. GÓMEZ-CORTÉS[1], G.A. LÓPEZ[2], M.L. NÓ[2], [1]Universidad del Pais Vasco, Dpt. Fisica Materia Condensada, Facultad de Ciencia y Tecnología, Bilbao, Spain; [2]Universidad del Pais Vasco, Dpt. Fisica Aplicada II, Facultad de Ciencia y Tecnología, Bilbao, Spain

B-4:IL09 **Recent Advances in Magnetic Shape Memory Thin Films**
S. FABBRICI, P. RANZIERI, M. CAMPANINI, L. NASI, F. CASOLI, E. BUFFAGNI, R. CABASSI, V. GRILLO, F. ALBERTINI, IMEM-CNR, Parma, Italy; C. MAGÉN, Instituto de Nanociencia de Aragón, Zaragoza, Spain; F. CELEGATO, G. BARRERA, P. TIBERTO, INRIM, Torino, Italy

Session B-5
Engineering

B-5:IL01 **Design of Multifunctional SMA Devices Using Finite Element Simulation Methods**
T. BEN ZINEB, LEMTA Université de Lorraine CNRS, Vandoeuvre les Nancy, France

B-5:IL02 **Enviromentally Assisted Fatigue of NiTi**
P. SITTNER, J. RACEK, B. MARESOVA, L. KADERAVEK, L. HELLER, Institute of Physics of the ASCR, Prague, Czech Republic

B-5:L03 **A Method for Upscaling Microscale Features to Macroscale Properties**
M. GRIGORIU, Department of Civil and Environmental Engineering, Cornell University, Ithaca, New York, USA

B-5:L04 **High Speed Smart Soft Composite (SSC) Structure Actuator with Large Deformation**
SUNG-HYUK SONG, J.Y. LEE, H. RODRIGUE, S.H. AHN, Department of Mechanical & Aerospace Engineering, Seoul National University, Seoul, Korea

B-5:L05 **Structural Effects of Thermomechanical Processing on the Static and Dynamic Responses of Powder Metallurgy Fe-Mn-Si Based Shape Memory Alloys**
E. MIHALACHE, B. PRICOP, R.I. COMANECI, M.G. SURU, N.M. LOHAN, M. MOCANU, **L.G. BUJOREANU**, "Gheorghe Asachi" Technical University of Iasi, Romania; B. ÖZKAL, Istanbul Technical University, Istanbul, Turkey

Session B-6
Applications

B-6:L01 **Shape Memory Alloy Rods with Variable Flexural Stiffness for Spine Correction: Manufacturing, Modeling and Biomechanical Evaluation**
V. BRAILOVSKI, Y. FACCHINELLO, M. BRUMMUND, Y. PETIT, Ecole de Technologie Superieure, Montreal, Quebec, Canada; J-M. MAC-THIONG, Department of Surgery, Faculty of Medicine, University of Montreal, Montreal, Quebec, Canada

B-6:L02 **A New Design of a Nitinol Ring-like Wire for Suturing in Deep Surgical Field**
A. NESPOLI[1], V. DALLOLIO[2], **E. VILLA**[1], F. PASSARETTI[1], [1]Consiglio Nazionale delle Ricerche, Istituto per l'Energetica e le Interfasi (CNR-IENI), Lecco, Italy; [2]ProMev, Lecco, Italy

B-6:L03 **Manufacturing and Processing of New Ni-free SMA for Biomedical Implants**
S. DUBINSKIY[1], V. BRAILOVSKI[2], S.PROKOSHKIN[1], K. INAEKYAN[2], YU. ZHUKOVA[1], V. SHEREMETYEV[1], A. KONOPATSKIY[1], [1]National University of Science and Technology "MISIS", Moscow, Russia; [2]Ecole de Technologie Superieure, Montreal, Quebec, Canada

B-6:L04 **Heat Treatment of Endodontic Files**
F.M. BRAZ FERNANDES[1], J.P. OLIVEIRA[1], A.R. ALVES[1], N. SCHELL[2], [1]CENIMAT/i3N, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Caparica, Portugal; [2]Institute of Materials Research, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany

B-6:IL05 **Advances in Single Crystal Technology of Magnetic Shape Memory Materials**
E. PAGOUNIS, ETO MAGNETIC GmbH, Stockach, Germany

B-6:IL06 **A Magnetic Shape Memory Micropump and Other Applications**
K. ULLAKKO, A. SAREN, D. MUSIIENKO, A. SOZINOV, J. TELLINEN, Lappeenranta University of Technology, Material Physics Laboratory, Savonlinna, Finland

Poster Presentations

B:P01 **Experimental Study and Modeling of Pseudoelastic Systems for the Design of a Complex Passive Damper**
A. NESPOLI[1], **D. RIGAMONTI**[2], M. RIVA[3], E. VILLA[1], F. PASSARETTI[1], [1]Consiglio Nazionale delle Ricerche - Istituto per l'Energetica e le Interfasi (CNR-IENI) Unità di Lecco, Lecco, Italy; [2]Politecnico di Milano, Italy; [3]INAF, Osservatorio di Merate, Lecco, Italy

B:P02 **Mechanical and Superelastic Properties of Au-51Ti-18Co Biomedical Shape Memory Alloy Heat-treated at 1173K to 1373K**
T. BUASRI, H. SHIM, M. TAHARA, T. INAMURA, K. GOTO, H. HOSODA, Tokyo Insititute of Technology, Yokohama, Kanagawa, Japan; H. KANETAKA, Tohoku University, Sendai, Miyagi, Japan; Y. YAMABE-MITARAI, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

B:P03 **Influence of Intermediate Layer Formation on Properties of Bimetallic Shape Memory Alloy Composites Produced by Explosion Welding**
S. BELYAEV, N. RESNINA, E. DEMIDOVA, I. LOMAKIN, O. MEDVEDEV, Saint Petersburg State University, Saint Petersburg Russia; V. RUBANIK, V. RUBANIK Jr., Institute of Technical Acoustics NAS of Belarus, Vitebsk, Belarus Vitebsk State Technological University, Vitebsk, Belarus

B:P04 **The Influence of the Heat Treatment Temperature on Thermal Properties of Ni-rich NiTi Shape Memory Alloy**
B. BEN FRAJ, Z. TOURKI, Mechanical Laboratory of Sousse, National Engineering School of Sousse, Sousse, Tunisia

B:P05 **On the Nanostructures Gradation in Thermomechanically Treated Ti-Ni SMA**
S. PROKOSHKIN[1], V. BRAILOVSKI[2], S. DUBINSKIY[1], K. INAEKYAN[2], A. KREITCBERG[2], [1]National University of Science and Technology "MISIS", Moscow, Russia; [2]Ecole de Technologie Superieure, Montreal, Quebec, Canada

B:P06 **The Magnetic States of Co and Cr Ni-Co-Mn-In(Sn) Heusler Alloys**
V. BUCHELNIKOV[1], V.V. SOKOLOVSKIY[1], P. ENTEL[2], [1]Chelyabinsk State University, Chelyabinsk, Russia; [2]University of Duisburg-Essen, Duisburg, Germany

B:P07 **Magnetic and Magnetocaloric Properties of Ni-Co-Mn-Sn Heusler Alloys**
M. DROBOSYUK, V.D. BUCHELNIKOV, R.R. FAYZULLIN, S.V. TASKAEV, Chelyabinsk State University, Chelyabinsk, Russian Federation

B:P08 **Contributions to Transformation Entropy Change in Magnetic Shape Memory Alloys**
C. SEGUI, **E. CESARI**, Dept. de Física, Universitat de les Illes Balears, Palma de Mallorca, Spain

B:P09 **Influence of Softening on Martensitic Transformation During Ti50Ni50 Alloy Thermal Cycling**
A. SIBIREV, S. BELYAEV, N. RESNINA, Saint-Petersburg State University, Saint-Petersburg, Russia

B:P10 **Calorimetric Study of Hysteresis Effects on the Magnetocaloric Effect in Ni-Co-Mn-Sn Alloys**
B. EMRE[1], E. STERN-TAULATS[2], S. YUCE[3], N. BRUNO[4], A. PLANES[2], L. MAÑOSA[2], I. KARAMAN[4, 5], [1]Ankara University, Faculty of Eng., Dept. of Eng. Phys., Ankara, Turkey; [2]Dept. ECM. Ftat. Física. Universitat de Barcelona, Barcelona, Catalonia; [3]Ondokuz Mayis University, Faculty of Arts&Science, Dept. Phys., Samsun, Turkey; [4]Dept. of Mechanical Engineering, Texas A&M University, College Station, TX, USA; [5]Dept. of Materials Science and Engineering, Texas A&M University, College Station, TX, USA

B:P11 **Properties of Ni2MnGa-based Thin Films Obtained by Magnetron Sputtering**
I.V. GRIBOV, A.P. NOSOV, V.I. OSOTOV, M.N. Miheev Institute of Metal Physics of Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russia; B.A. LOGINOV, National Research University of Electronic Technology (MIET), Zelenograd, Moscow, Russia

B:P12 **Design and Experimental Testing of a NiTi-based, High Frequency, Centripetal Multiple Actuator**
E. BORLANDELLI, D. SCARSELLI, **P. BETTINI**, G. SALA, M. QUADRIO, Politecnico di Milano, Milano, Italy; A. NESPOLI, D. RIGAMONTI, E. VILLA, CNR IENI, Lecco, Italy

B:P13 **Recovery and Structural Evolution during Annealing of Forged NiTi Alloy Bar**
S. RIBEIRO[1], **P. RODRIGUES**[2], E. TEIXEIRA[1], S. DINIZ[3], L. ANDRADEUFF, G. SILVA[4], A. PAULA[3], F. BRAZ FERNANDES[2], J. OTUBO[4], [1]Centro Universitário de Volta Redonda (UniFOA), Volta Redonda, RJ, Brazil.; [2]Universidade Nova de Lisboa, CENIMAT– iN3, Caparica, Portugal; [3]Instituto Militar de Engenharia (IME), Mechanical Engineering and Materials Dept, Rio de Janeiro, RJ, Brazil.; [4]Instituto Tecnológico da Aeronaútica, Mechanical Engineering and Aeronautic Dept., São José dos Campos, SP, Brazil

B:P14 **Mechanical Properties of Nanoceramic Zirconia Coatings on Superelastic NiTi Strips**
N.I.A. LOPES, V.T.L. BUONO, UFMG, Belo Horizonte, MG, Brazil

B:P15 **Application of TiNi Alloy Coils as a Filtration Rating Controller for Three Dimensional Filter Made of a Stainless Steel Wire**
YOICHI KISHI, Z. YAJIMA, Advanced Materials Systems Research and Development Center, Kanazawa Institute of Technology, Hakusan, Ishikawa, Japan; C. SHIOMI, T. MATSUMOTO, T. OHIGASHI, Y.NISHIMOTO, Fuji Filter Manufacturing Co. Ltd., Tokyo, Japan

B:P16 **Conical Shape Memory Actuator**
E. OSTROPIKO, IA. RAZOV, Saint-Petersburg State University, Saint-Petersburg, Russia

B:P17 **Intelligent Shape Memory Device for Clipping Vessels**
E.P. RYKLINA, A.V. KOROTITSKIY, I.YU. KHMELEVSKAYA, S.D. PROKOSHKIN, National University of Science and Technology "MISIS", Moscow, Russia; M.V. SOUTORINE, A.N. CHERNOV, Globetek 2000 PTY LTD, Brighton, Victoria, Australia

SYMPOSIUM C

RECENT ADVANCES IN MULTIFERROIC AND MAGNETOELECTRIC MATERIALS AND APPLICATIONS

Oral Presentations

C:KL **Coupling Magnetism to Electricity In Multiferroic Heterostructures**
R. RAMESH, Department of Physics and Department of Materials Science and Engineering, University of California, Berkeley, CA, USA

Session C-1

Theory and Modeling of Single Phase and Composite Multiferroics

C-1:IL01 **Coupled Electricity and Magnetism in Solids: Some Novel Effects**
D.I. KHOMSKII, II Physikalisches Institut, Universitaet zu Koeln, Koeln, Germany

C-1:IL02 **The Origin of Hyper-ferroelectricity in LiBO3 (B=V, Nb, Ta, Os)**
PENGFEI LI, XINGUO REN, G-C GUO, **LIXIN HE**, Key Laboratory of Quantum Information, University of Science and Technology of China, Hefei, Anhui, China

C-1:IL03 **New Multiferroics at Interfaces of Conducting Oxides**
J.M. RONDINELLI, Northwestern University, Evanston, Illinois, USA

C-1:IL04 **The Path Matters: The Key to Magnetization Reversal by Electric Field**
J. INIGUEZ, Luxembourg Institute of Science and Technology, Esch-sur-Alzette, Luxembourg

C-1:IL05 **Metallo-ferroelectricity, Multiferroicity and Magnetoelectricity in Layered Perovskites**
V. FIORENTINI, A. FILIPPETTI, J. INIGUEZ*, F. RICCI, P. DELUGAS, M. SCARROZZA, M.B. MACCIONI, Dipartimento di Fisica, Università di Cagliari, and CNR-IOM, Cagliari, Italy ; *LIST, Esch-sur-Alzette, Luxembourg

C-1:IL06 **Magnetoelectric Multipoles in Multiferroics and Complex Oxides**
M. FECHNER, ETH Zürich, Switzerland

C-1:IL07 **Impact of Magnetic Configuration and Local Electric Dipoles on Electronic Properties of BiFeO3 with Spatial Bond Length Modulation**
D. RICINSKI, Tokyo Institute of Technology, Yokohama, Japan

C-1:L08 **Composites for Novel Magnetic Properties**
E.A. BURGESS, A.P. HIBBINS, J.R. SAMBLES, S. HORSLEY, C. GALLAGHER, C. MCKEEVER, EPSRC Centre for Doctoral Training in Metamaterials (XM2), Dept.of Physics and Astronomy / Dept.of Engineering, University of Exeter, UK

Session C-2

Non-oxide, Organic-inorganic and 5-d Oxide Multiferroics

C-2:L01 **Multiferroic Properties of Organic-inorganic Hybrid Compounds**
T.M. PALSTRA, **M. KAMMINGA**, Zernike Institute for Advanced Materials, University of Groningen, The Netherlands

C-2:IL02 **Multiferroic Behavior Triggered by a Spin-state Transition**
V. ZAPF, S. CHIKARA, S. LIN, B. SCOTT, C. BATISTA, N. SMYTHE, Los Alamos National Lab., Los Alamos, NM, USA

C-2:IL03 **Multiferroics and Magnetoelectric Effects in Metal-organic Frameworks**
YOUNG SUN, YING TIAN, WEI WANG, LIQIN YAN, YISHENG CHAI, Institute of Physics, Chinese Academy of Sciences, Beijing, China

C-2:L04 **Infrared Phonon Modes and Intrinsic Dielectric Response of Magnetodielectric La2CoMnO6**
R.L. MOREIRA, R. PANIAGO, R.M. ALMEIDA, Belo Horizonte, MG, Brazil; R.X. SILVA, C.W.A. PASCHOAL, São Luís, MA, Brazil

C-2:L05 **Synthesis and Characterization of Lead Iron Niobate for Electronic Applications**
S. BAHEL, MAALTI PURI, S. BINDRA NARANG, Department of Electronics Technology, Guru Nanak Dev University, Amritsar, India

Session C-3

Advances in Materials Synthesis and Processing

C-3:IL01 **DNA-assisted Self-assembly of Multiferroic Nanocomposites and Studies on Magneto-electric Interactions**
G. SRINIVASAN[1], G. SREENIVASULU[1], M. PANDA[2], F.A. CHAVEZ[2], [1]Department of Physics, Oakland University, Rochester, MI, USA; [2]Department of Chemistry, Oakland University, Rochester, MI, USA

C-3:IL02 **Epitaxial Growth of BiFeO3 Thin Films by RF and Dual Ion Beam Sputtering**
SEIJI NAKASHIMA, M. SHIMIZU, H. FUJISAWA, University of Hyogo, Himeji, Hyogo, Japan

C-3:L03 **Structural Study on Pure and Ca Doped Bismuth Ferrite Films**
G. MONTES ALBINO, O. PERALES, B. FERRER, B. RENTERIA, H. CHINCHAY, University of Puerto Rico Mayaguez, Mayaguez, Puerto Rico

C-3:IL04 **Signatures of B-Site Cationic Ordering in Double Perovskites**
A. RUEDIGER, R. NECHACHE, M. NICKLAUS, A. PIGNOLET, F. ROSEI, INRS-EMT, Varennes, Qc, Canada

C-3:IL05 **Spray Pyrolysis to Process Thin Films of Multiferroic Materials**
A.E. LÓPEZ-LÓPEZ, L. ROLDÁN, J. ORTIZ-LANDEROS, **C. GOMEZ-YANEZ**, Department of Metallurgical and Materials Eng., ESIQIE, National Polytechnic Institute, Zacatenco, Mexico city, Mexico

C-3:L06 **Laminated Ceramic Composites Based on PZTN-CFO Compounds**
P. GALIZIA, I.V. CIUCHI, D. GARDINI, C. GALASSI, CNR-ISTEC, Faenza, Italy

C-3:L07 **High Pressure High Temperature (HP / HT) Growth of Multifunctional Perovskites. How Chemical Substitutions can be used to Switch from a Magnetoresistive to a Dielectric (Polar) Magnet**
D. DELMONTE, E. GILIOLI, R. CABASSI, F. BOLZONI, IMEM CNR, Parma, Italy; F. MEZZADRI, F. ORLANDI, G. CALESTANI, Chemistry Dept. University of Parma, Parma, Italy; M. SOLZI, Physics and Earth Science, Dept. University of Parma, Parma, Italy

C-3:IL08 **Self-assembled Magnetoelectric Nanocomposites**
J.L. MACMANUS-DRISCOLL, Department of Materials Science, University of Cambridge, Cambridge, UK

C-3:L09 **Correlation of Magnetoelectric Coupling in Multiferroic BaTiO3-BiFeO3 Superlattices and Composite Thin Films with Ordering of Oxygen-related Defects**
M. LORENZ[1], V. LAZENKA[2], G. WAGNER[3], P. SCHWINKENDORF[1], M.J. VAN BEAL[4], A. VANTOMME[2], K. TEMST[2], O. OECKLER[3], M. GRUNDMANN[1], [1]Institut für Experimentelle Physik II, Universität Leipzig, Leipzig, Germany; [2]Instituut voor Kern- en Stralingsfysica, KU Leuven, Leuven, Belgium; [3]Institut für Mineralogie, Kristallographie und Materialwissenschaft, Universität Leipzig, Leipzig, Germany; [4]Laboratorium voor Vaste-Stoffysica en Magnetisme, KU Leuven, Leuven, Belgium

C-3:L10 **Heterostructured Ceramic Materials Based on PZTN-CFO Compounds**
P. GALIZIA, C. CAPIANI, **C. GALASSI**, CNR-ISTEC, Faenza, Italy

C-3:L11 **Microstructural, Dielectric and Magnetic Properties of h-BaTiO3 and CoFe2O4 Composites Prepared by LHPG Technique**
D. GARCIA, F.P. MILTON, D.S.F VIANA, F.L. ZABOTTO, V.P. GASTALDO, A.J. GUALDI, P.C. CAMARGO, A.J.A. DE OLIVEIRA, Physics Department, Federal University of Sao Carlos, SP, Brazil; M.R.B. ANDREETA, Materials Engineering Department, Federal University of Sao Carlos, SP, Brazil

Session C-4
Magnetoelectric Characterization and Electric Field Control of Magnetization

C-4:IL01 **Voltage Control of Magnetic Vortex States in Ni Discs Using Ferroelectric Substrates**
M. GHIDINI[1, 2], R. MANSELL[3], X. MOYA[1], B. NAIR[1], S. FAROKHIPOOR[1], D. PESQUERA[1], F. MACCHEROZZI[4], C.H.W. BARNES[3], R.P. COWBURN[3], S.S. DHESI[4], **N.D. MATHUR**[1], [1]Department of Materials Science, University of Cambridge, Cambridge, UK; [2]DiFeST, University of Parma, Parma, Italy; [3]Cavendish Laboratory, University of Cambridge, Cambridge, UK; [4]Diamond Light Source, Chilton, Didcot, Oxfordshire, UK

C-4:IL02 **Spintronics with Ferroelectrics**
E.Y. TSYMBAL, Department of Physics and Astronomy, University of Nebraska, Lincoln, Nebraska, USA

C-4:IL03 **Electrical Control of Large Magnetization Reversal in a Helimagnet**
KEE HOON KIM, CeNSCMR, Department of Physics and Astronomy, Seoul National University, Seoul, Korea

C-4:IL04 **Mesoscale Interfacial Dynamics in Magnetoelectric Nanocomposites**
D. VIEHLAND, J.F. LI, Dept. Materials Science and Engineering, Virginia Tech, Blacksburg, VA, USA

C-4:IL05 **Observation and Control of Spin Chirality in Room-temperature Magnetoelectric Hexaferrites**
TSUYOSHI KIMURA[1], H. UEDA[1], H. NAKAJIMA[1], T. USUI[1], Y. HIRAOKA[1], Y. WAKABAYASHI[1], Y. TANAKA[2], [1]Osaka University, Toyonaka, Osaka, Japan; [2]RIKEN SPring-8 Center, Japan

C-4:IL06 **Room Temperature Magnetoelectric Effect in Novel Oxides**
J.A. EIRAS, Federal University of São Carlos, São Carlos, SP, Brazil

C-4:L07 **Enhanced Magnetoelectric Coupling in Multiferroics from First-principles**
S. LISENKOV, University of South Florida, Tampa, FL, USA

C-4:L08 **Observation of Magnetoelectric Effect in Organic Ferromagnetic and Ferroelectric Liquid Crystals**
RUI TAMURA, K. SUZUKI, Kyoto University, Kyoto, Japan; Y. UCHIDA, Osaka University, Osaka, Japan

C-4:L09 **Anomalous Magnetoresistivity in Co-doped ZnO with Varying Bottom Gate Voltage**
MIYEON CHEON[1], YONG CHAN CHO[2], CHUL-HONG PARK[3], SE YOUNG JEONG[4,5], [1]Crystal Bank Research Institute, Pusan National University, Miryang, Korea; [2]Korea Research Institute of Standards and Science, Daejeon, Korea; [3]Dept. of Physics Education, Pusan National University, Busan, Korea; [4]Dept. of Cogno-Mechatronics Engineering, Pusan National University, Miryang, Korea; [5]Dept. of Optics and Mechatronics Engineering, Pusan National University, Miryang, Korea

Session C-5
Domain Walls and Dynamics of Multiferroics

C-5:IL01 **Domain Walls and Magnetism in BiFeO3 – Redux**
L.W. MARTIN, Department of Materials Science and Engineering, University of California, Berkeley and Material Science Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

C-5:IL02 **Spiral Magnets in Thin Film Form**
B. NOHEDA, J.A. HEUVER, Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands; S. FAROKHIPOOR, Device Materials group, University of Cambridge, Cambridge, UK; C.J.M. DAUMONT, University of Tours, Tours cedex, France

C-5:IL03 **Scrutinizing Electronic Excitations of Multiferroics by Resonant Raman Scattering**
M.C. WEBER, M. GUENNOU, **J. KREISEL**, Luxembourg Institute of Science and Technology (LIST), Department Materials Research and Technology, Belvaux, Luxembourg

C-5:L04 **Broadband Dielectric Studies of Cobalt Ferrite and Nb-doped Lead Zirconium Titanate Multiferroic Composites**
R. GRIGALAITIS[1], A. SAKANAS[1], **J. BANYS**[1], C.E. CIOMAGA[2], L. MITOSERIU[2], [1]Department of Radiophysics, Faculty of Physics, Vilnius University, Vilnius, Lithuania; [2]Faculty of Physics, University "Al. I. Cuza" Iasi, Romania

Session C-6
New Effects

C-6:IL01 **Room-temperature Ferroelectricity in Atomically Thin 2D $CuInP_2S_6$**
LU YOU[1], FUCAI LIU[1], KYLE L. SEYLER[2], XIAODONG XU[2], ZHENG LIU[1], **JUNLING WANG**[1], [1]School of Materials Science and Engineering, Nanyang Technological University, Singapore, Singapore; [2]Department of Physics, University of Washington, Seattle, Washington, USA

C-6:L02 **Electric-field-induced Phase Transition and Related Giant Strain in Ultrathin Epitaxial BiFeO3 Films**
ZHIHONG WANG, Advanced Nanofabrication Core Lab, W.J. HU, T. WU, Physical Science and Engineering Division, L. CHEN, Imaging and Characterization Core Lab, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia

C-6:L03 **Temperature Dependent Polarization Reversal Mechanism in (Bi1/2Na1/2)TiO3-based Relaxor Ceramics**
J. GLAUM, J. DANIELS, M. HOFFMAN, School of Materials Science and Engineering, UNSW Australia, NSW, Australia; H. SIMONS, Department of Physics, Technical University of Denmark, Kgs. Lyngby, Denmark; M. ACOSTA, Institute of Materials Science, Ceramics Group, Technische Universität Darmstadt, Germany

C-6:L04 **Impendance Spectroscopy Studies on Li and Cr Substituted NiO**
SUNIL KUMAR, S. SUPRIYA, M. KAR, Department of Physics, Indian Institute of Technology Patna, Patna, India

Session C-7
Devices and Applications

C-7:IL01 **Applications of Heterostructured Multiferroic MEMS Cantilevers**
ICHIRO TAKEUCHI, University of Maryland, Department of Materials Science and Engineering, College Park, MD, USA

C-7:IL02 **Multiferroic and Magnetoelectric Nanocomposites for Data Processing**
W. KLEEMANN, H. WENDE, Universität Duisburg-Essen, Duisburg, Germany; P. BORISOV, West Virginia University, Morgantown, USA; C. SCHMITZ-ANTONIAK, FZ Jülich, Germany; L. HENRICHS, University of Leeds, UK

C-7:L04 **Permanent Ferroelectric Retention in BiFeO3 Mesocrystal**
YING-HUI HSIEH[1], FEI XUE[2], TIANNAN YANG[2], YEN-CHIN HUANG[3], YI-CHUN CHEN[3], CHUN-GANG DUAN[4], LONG-QING CHEN[2], QING HE[5], YING-HAO CHU[1,6], [1]Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan; [2]Department of Materials and Engineering, Pennsylvania State University, University Park, PA, USA; [3]Department of Physics, National Cheng Kung University, Tainan, Taiwan; [4]Key Lab of Polar Materials and Devices, Ministry of Education, East China Normal University, Shanghai, China; [5]Department of Physics, Durham University, Durham, UK; [6]Institute of Physics, Academia Sinica, Taipei, Taiwan

C-7:IL05 **Electric-field Control of Magnetic Order just above Room Temperature**
V. IVANOVSKAYA[1], R.O. CHERIFI[1], L.C. PHILLIPS[1], A. ZOBELLI[2], I.C. INFANTE[3], E. JACQUET[1], V. GARCIA[1], S. FUSIL[1], P.R. BRIDDON[4], N. GUIBLIN[3], A. MOUGIN[2], S. VALENCIA[5], A.A. ÜNAL, F. KRONAST[5], B. DKHIL[3], M. BIBES[1], **A. BARTHELEMY**[1], [1]Unité Mixte de Physique CNRS / Thales, Palaiseau & Université Paris-Sud, Orsay, France; [2]Laboratoire de Physique des Solides, Université Paris-Sud, CNRS UMR 8502, Orsay, France; [3]Laboratoire SPMS, UMR 8580, Ecole Centrale Paris-CNRS, Châtenay-Malabry, France; [4]School of Electrical, Electronic and Computer Engineering, University of Newcastle, Newcastle upon Tyne, UK; [5]Helmholtz Zentrum Berlin für Materialen und Energie, Berlin, Germany

C-7:IL06 **Voltage-controlled Exchange Bias in Lithographically Patterned Heterostructures**
C. BINEK, W. ECHTENKAMP, X. HE, M. STREET, A. MAHMOOD, J. WANG, K. BELASHCHENKO, P. DOWBEN, Department of Physics & Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln, USA

C-7:IL07 **Multiferroic Technology for Advanced Magnetic Data Storage**
M.M. VOPSON, University of Portsmouth, Faculty of Science, SEES, Portsmouth, UK; S. LEPADATU, T. MERCER, University of Central Lancashire, School of Computing, Engineering and Physical Sciences, Preston, UK; M. SPREITZER, Institute Jožef Stefan, Ljubljana, Slovenia

Poster Presentations

C:P01 **Epitaxy Fe3O4 Thin Films on Flexible Substrates Via MBE**
PING-CHUN WU, Department of Material Science and Engineering, National Chiao Tung University, Taiwan

C:P02 **Multiferroelectric Properties of Terfenol-D/PMN-PT Thin Film Composite**
JEONG-JOO KIM[1], JAI-YEOUL LEE[2], HEE YOUNG LEE[2], [1]School of Materials Science and Engineering, Kyungpook National University, Daegu, Korea; [2]School of Materials Science and Engineering, Yeungnam University, Gyeongsan, Korea

C:P03 **Synthesis and Characterization of Barium Titanate/Cobat Ferrite Nanocomposite**
N.D.S. MOHALLE, J.B. DA SILVA, Federal University of Minas Gerais, Belo Horizonte, Brazil; CDTN/CNEN, Belo Horizonte, Brazil

C:P04 **Optical Properties of a Potassium-alumina-borate Glasses Doped with Nanocrystalls of MnFe2O4 and Fe2O3**
P.S. SHIRSHNEV, N.V. NIKONOROV, D.J. PANOV, D.I. SOBOLEV, S.A. STEPANOV, ITMO University, Saint-Petersburg, Russian Federation

C:P05 **Technology and Properties of PMN–PT–ferrite Multiferroic Ceramic Composite Materials**
R. SKULSKI, D. BOCHENEK, P. NIEMIEC, A. CHROBAK, University of Silesia, Faculty of Computer Science and Materials Science, Institute of Technology and Mechatronics, Sosnowiec, Poland

C:P06 **Multiferroic Perovskites Synthesized by Gelatin Method**
P. MENDONCA PIMENTEL, J.L.S. DUTRA, G.C.B. DANTAS, Universidade Federal Rural do Semi-Árido, Campus Angicos, Angicos- RN, Brasil; A.C. LIMA, J.H. ARAÚJO, Universidade Federal do Rio Grande do Norte, Natal-RN, Brasil; O.R. BAGNATO, CNPEM, Campinas-SP, Brazil

C:P07 **Effect of Ba/Ti Ratio on Dielectric Properties of Nanogold Modified Barium Titanate Ceramics**
S. ANANTA, J. NONKUMWONG, L. SRISOMBAT, Department of Physics and Materials Science, and Department of Chemistry, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand

C:P08 **Ferromagnetic and Ferroelectric Properties of Bi0.95La0.05Fe0.99Ti0.01O3 Nano Ceramics Sintered by the Two-step Method**
Y.H. TIAN, Q.Y. FU, D.X. ZHOU, Z.P. ZHENG, W. LUO, **YUNXIANG HU**, School of optical and electronic information, Huazhong University of Science and Technology, Wuhan, China

C:P09 **A Two-step Method Preparation of Core-shell CoFe2O4@ BaTiO3 Multiferroic Composites**
L. ZHOU, **DONGXIANG ZHOU**, Q.Y. FU, Y.X. HU, Z.P. ZHENG, School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, PR China

C:P10 **Ultrasonic Attenuation of the Transformer Oil-based Ferrofluid**
A.D. KURILOV, D.N. CHAUSOV, Moscow State Regional University, Moscow, Russian Federation

C:P11 **The Basic Properties of the Ferroelectromagnetic Composites Based on the Ferrite and PZT-type Powders**
D. BOCHENEK, P. NIEMIEC, R. SKULSKI, University of Silesia, Faculty of Computer Science and Material Science, Institute of Technology and Mechatronics, Sosnowiec, Poland

C:P12 **Synthesis and Multifunctional Properties of La2CoMnO6 Double Perovskite Compound**
T. YADAV, V. SHELKE, Novel Materials Research Laboratory, Department of Physics, Barkatullah University, Bhopal, India

C:P13 **Effect of Complexing Agent Content on the Formation of Magnesium Ferrite Nanoparticles via Wet Chemical Method**
L. SRISOMBAT, J. NONKUMWONG, S. ANANTA, Department of Chemistry, and Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand

C:P14 **Synthesis and Characterization of Soft Magnetic Nanocomposite in Fe2O3-Al System by Solid State Reaction**
CHUNGHYO LEE, Mokpo National University, Muan, South Korea

C:P15 **Magnetoelectric Effect in Laminates with Functionally Graded Ferromagnetic Amorphous Alloys**
A.P. NOSOV, I.V. GRIBOV, V.I. OSOTOV, M.N.Miheev Institute of Metal Physics of Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russia; G. SREENIVASULU, G. SRINIVASAN, Physics Department, Oakland University, Rochester, Michigan, USA; B.A. LOGINOV, National Research University of Electronic Technology (MIET), Zelenograd, Moscow, Russia

C:P16 **Electromagnetic Interference Shielding Response and Photocatalytic Activity of Polyaniline Coated Fe3O4@TiO2 Core-shell Particles**
SO-YONG PARK, **JIN-SEUNG JUNG**, Department of Chemistry, Gangneung-Wonju National University, Gangneung, South Korea

C:P17 **Influence of Mg:Fe Ratio on Chemical Composition of MgFe2O4 Nanoparticles Synthesized by Hydrothermal Method**
J. NONKUMWONG, L. SRISOMBAT, S. ANANTA, Department of Chemistry, and Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand

C:P18 **Effects of Surface Modification on Phase Formation, Microstructure and Multiferroic Properties of Barium Titanate Ceramics Doped with Gold Nanoparticles**
J. NONKUMWONG, **K. SUWANNARAT**, L. SRISOMBAT, S. ANANTA, Department of Chemistry, and Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand

C:P19 **Electrical, Magnetic and Magnetoelectric Properties in BT-NZFO Composites**
M. RAWAT, Department of Physics, H.N.B. Garhwal (A Central) University, Srinagar Garhwal, Uttarakhnad, India

C:P20 **Magnetodielectric Response of Nano-crystalline Pr2CuO4 Ceramics**
P.H. SALAME, Dept. of Applied Physics, Laxminarayan Institute of Technology, RTM Nagpur University, Nagpur, India

C:P21 **Enhanced Photon Absorption and Photocurrent Generation by Implementing a Hexagonal LuMnO3-LuFeO3 Multiferroic Bi-layer Structure**
HYEON HAN, HYUN M. JANG, Department of Materials Science and Engineering, and Division of Advanced Materials Science, Pohang University of Science and Technology (POSTECH), Pohang, Republic of Korea

SYMPOSIUM D
ADVANCES IN INORGANIC LUMINESCENT MATERIALS AND APPLICATIONS

Oral Presentations

Session D-1
Physics and Modelling of Luminescent Materials

D-1:IL01 **Modelling of Luminescent Confined Structures**
F. PRUDENZANO, Politecnico di Bari, Bari, Italy

D-1:IL02 **Valence Stability of Rare Earth Ions by Madelung Lattice Site Potential in Various Oxide Lattices**
M. YOSHIMURA, National Cheng Kung University, Promotion Center for Global Materials Research, Tainan, Taiwan, Formerly, Tokyo Institute of Technology, Japan

D-1:IL03 **Discovery of Novel Narrow-band Red Phosphors using High-throughput First Principles Descriptors**
ZHENBIN WANG, **SHYUE PING ONG**, Department of NanoEngineering, University of California San Diego, La Jolla, CA, USA

D-1:IL04 **Luminescence of Organo-metal-halide Perovskites Probed at Micro- and Nanoscales**
I.G. SCHEBLYKIN, Chemical Physics, Lund University, Lund, Sweden

Session D-2
Photonic and Biophotonic Structures; Plasmonic Metamaterials; Photovoltaics; Non-linear Optical Materials and Processes

D-2:IL01 **Nonlinear Photonic Processes in Condensed Matter**
C.B. DE ARAUJO, Departamento de Física, Universidade Federal de Pernambuco, Recife, PE, Brazil

D-2:IL02 **Non-linear Optical Properties of Meta-surface**
S.M. CHEN, S.Y. CHIN, **KOK WAI CHEAH**, Department of Physics and Institute of Advanced Materials, Hong Kong Baptist University, Kowloon Tong, Hong Kong SAR, China; G.X. LI, SHUANG ZHANG, School of Physics & Astronomy, University of Birmingham, Birmingham, UK; T. ZENTGRAF, Department of Physics, University of Paderborn, Paderborn, Germany; XIANZHONG CHEN, SUPA, Institute of Photonics and Quantum Sciences, School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, UK

D-2:IL03 **Contact-free Terahertz Thermometry in Solid, Liquid and Biological Model Systems**
R. NACCACHE, Dept. of Chemistry and Biochemistry, Concordia University, Montréal, Canada; A. MAZHOROVA, A. MARKOV, L. RAZZARI, F. VETRONE, R. MORANDOTTI, Institut National de la Recherche Scientifique – Énergie, Matériaux et Télécommunications, Université du Québec, Varennes, QC, Canada; M. CLERICI, School of Engineering, University of Glasgow, Glasgow, UK; L.K. KHORASHAD, A.O. GOVOROV, Dept. of Physics and Astronomy, Clippinger Research Labs, Ohio University, OH, USA

D-2:IL04 **Glass-derived Photonic Crystals structures**
A. CHIAPPINI[1], C. ARMELLINI[1], A. PIOTROWSKA[1,2], A. CARPENTIERO[1], S. VARAS[1], M. MAZZOLA[1], L. PASQUARDINI[3], L. LUNELLI[3,4], A. VACCARI[5], S. PELLI[6,7], A. LUKOWIAK[8], A. QUANDT[9], C. PEDERZOLLI[3], D. ZONTA[1,2], G.C. RIGHINI[6,7], R. RAMPONI[10], M. FERRARI[1,7], [1]CNR-IFN CSMFO Lab., Povo, Trento, Italy, [2]Dep. of Civil, Environmental and Mechanical Engineering, Univ. of Trento, Trento, Italy, [3]FBK-LaBSSAH, Povo Trento, Italy, [4]CNR-Institute of Biophysics, Unit at Trento, Povo Trento, Italy, [5]ARES unit at FBK-CMM, Povo, Trento, Italy, [6]IFAC-CNR, MiPLab., Sesto Fiorentino, Italy, [7]Enrico Fermi Centre, Roma, Italy, [8]Institute of Low Temperature and Structure Research, PAS, Wroclaw, Poland, [9]MERG Group, University of Witwatersrand, Johannesburg, South Africa, [10]IFN-CNR and Politecnico di Milano, Dip. di Fisica, Milano, Italy

D-2:L05 **Cell Performances of Inorganic-organic Hybrid Solar Cells using Fluorosilicate/Phosphorus Oxide Composite Microparticles**
KEISUKE SATO, Y. SUGANO, K. HIRAKURI, Department of Electrical and Electronic Engineering, Tokyo Denki University, Adachi-ku, Tokyo, Japan; N. FUKATA, International Center for Materials Nanoarchitectonics, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

Session D-3
Phosphors, Quantum Dots and Low Dimensional Materials for Lighting and Displays

D-3:L01 **Direct Observation of Eu or Mn Ions in Aluminum Nitride Phosphors**
LIANG-JUN YIN[1], JUN-TAO DONG[1], J.R. VAN OMMEN[2], H.T. (BERT) HINTZEN[3], [1]School of Energy Science and Engineering, University of Electronic Science and Technology of China, Chengdu, P.R. China; [2]Department of Chemical Engineering, Faculty of Applied Sciences, Delft University of Technology, Delft, The Netherlands; [3]Luminescent Materials Research Group, Faculty of Applied Sciences, Delft University of Technology, Delft, The Netherlands

D-3:L02 **Tunable Performance of Nanostructured Eu-doped Oxide and Oxynitride Thin Films**
I. CAMPS, A. MARISCAL, R. SERNA, Laser Processing Group, Institute of Optics - CSIC, Madrid, Spain

D-3:L03 **Phosphor in Glass Based on High Refractive Index Glasses for LEDs**
V. ASEEV, Y. TUZOVA, Y. NEKRASOVA, N. NIKONOROV, E. KOLOBKOVA, Y. FEDOROV, ITMO University, St. Petersburg, Russia

D-3:L04 **Ln(III)-Doped ZrO2 Nanoparticles through Hierarchical Multilayer Growth Strategy for White Light Emission Applications**
C.S. OLIVEIRA, F.A. SIGOLI, I.O. MAZALI, Institute of Chemistry, University of Campinas - UNICAMP, Campinas, SP, Brazil

D-3:L05 **Enhancement of Thermal Behavior of BaMgAl10O17:Eu2+ Blue Phosphors Using a Microwave Assisted Combustion Synthesis Process**
A. POTDEVIN, N. PRADAL, G. CHADEYRON, ENSCCF, Institut de Chimie de Clermont-Ferrand, Clermont-Ferrand and Université Blaise Pascal, Institut de Chimie de Clermont-Ferrand, Clermont-Ferrand; P. BONVILLE, CEA, Centre de Saclay, DSM/Service de Physique de l'Etat Condensé, Gif-sur-Yvette; R. MAHIOU, Université Blaise Pascal, Institut de Chimie de Clermont-Ferrand, Clermont-Ferrand and CNRS, UMR 6296, ICCF, Aubiere, France

D-3:L06 **The Dependence of Luminous Efficacies (LE) and Color Rendering Indices (CRI) of Simulated Warm-white pcLEDs on the Applied Red Emitting Phosphor**
F. BAUR, T. JUESTEL, Münster University of Applied Sciences, Department of Chemical Engineering, Steinfurt, Germany

D-3:L07 **Optical Properties of Nanocrystalline ZrO2:Mn Thin Films Prepared by the Sol-gel Dip Coating Methods**
K. JOY[1,2], I. JOHN BERLIN[2], [1]Department of Physics, Heera College of Engineering and Technology, Thiruvannathapuram, Kerala, India; [2]Department of Physics, Mar Ivanios College, Thiruvannathapuram, Kerala, India

D-3:L08 **Luminescent Glasses and Glass Ceramics for White Light Emitting Diodes**
F. STEUDEL[1], A.C. RIMBACH[2], S. LOOS[2], B. AHRENS[1,2], S. SCHWEIZER[1,2], [1]Fraunhofer Application Center of Inorganic Phosphors, Branch Lab of Fraunhofer Institute for Microstructure of Materials and Systems IMWS, Soest, Germany; [2]Department of Electrical Engineering, South Westphalia University of Applied Sciences, Soest, Germany

D-3:IL09 **From Red Band to Red Line Emitting Materials for Solid State Light Sources**
T. JUESTEL, F. BAUR, Münster University of Applied Sciences, Department of Chemical Engineering, Steinfurt, Germany

D-3:L10 **High Efficient Phosphor Based on Ion-exchanged Sodium-zinc-aluminosilicate Glasses**
Y.M. SGIBNEV, N.V. NIKONOROV, A.I. IGNATIEV, ITMO University, Saint-Petersburg, Russia

D-3:L11 **Luminescent Properties of Silver Molecular Clusters and Nanoparticles in Fluorine, Chlorine and Bromine Photo-thermo-refractive Glasses**
N. NIKONOROV, V. DUBROVIN, A. IGNATIEV, D. IGNATIEV, D. KLUKIN, A. SIDOROV, ITMO University, St. Petersburg, Russia

D-3:L12 **In Situ Formation and Photo Patterning of Emissive Quantum Dots**
A.K. BANSAL, I.D.W. SAMUEL, Organic Semiconductor Centre, School of Physics and Astronomy, University of St Andrews, North Haugh, St Andrews Fife, UK; **F. ANTOLINI**, L. STROEA, ENEA Dept. of Fusion and Technologies for Nuclear Safety and Security, Photonics Micro and Nanostructures Laboratory, Frascati (Rome), Italy; T. KASPONAS, G. RACIUKAITIS, EKSPLA UAB, Vilnius, Lithuania; A. HIRZER, V. SCHMIDT, Joanneum Research, Forschungsgesellschaft mbH, Materials - Institute for Surface Technologies and Photonics, Weiz, Austria; S. ALLARD, U. SCHERF, Institut für Polymertechnologie, Wuppertal, Bergische Universität Wuppertal, Germany

D-3:IL13 **Ultrafast Emission Processes in 2D Colloidal Nanosheets**
J.Q. GRIM, Nanocrystal Photonics Lab., Istituto Italiano di Tecnologia, Genova, Italy

D-3:L14 **Plasmonic Enhanced Rare Earth Doping Quantum Cutting Phosphor for Si Solar Cells**
DONG XIAO, TALIB HUSSAIN, HUIQI YE, LIANG TANG, Nanjing Institute of Astronomical Optics & Technology, Nanjing, Jiangsu, P.R. China

Session D-4
Advances in Scintillator Development

D-4:IL01 **Advances in Scintillation Physics Toward Development of New and Improved Scintillators**
G. BIZARRI, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

D-4:IL02 **Modelling Energy Deposition in Nanoscintillators to Predict the Efficiency of the X-ray-Induced Photodynamic Effect**
A.-L. BULIN[1], A. VASIL'EV[2], A. BELSKY[1], D. AMANS[1], G. LEDOUX[1], **C. DUJARDIN**[1], [1]Institut Lumière Matiére, UMR5306, Université Claude Bernard Lyon1-CNRS, France; [2]Skobeltsyn Institute of Nuclear Physic, Lomonosov Moscow State University, Moscow

D-4:IL03 **Recent Progress of Transparent Ceramic Scintillators**
TAKAYUKI YANAGIDA, Nara Institute of Science and Technology, Takayama, Ikoma, Nara, Japan

D-4:L04 **Influence of Raw Materials on Luminescent Properties of SiO2:Ce Glasses**
E. TRUSOVA[1], A. VEDDA[2], M. FASOLI[2], M. KORJIK[3], E. TRETYAK[4], [1]Belarusian State Technological University, Minsk, Belarus; [2]Department of Materials Science, University of Milano-Bicocca, Milano, Italy; [3]Research Institution of Nuclear Problems of the Belarusian State University, Minsk, Belarus; [4]Research Institute for Physical Chemical Problems of the Belarusian State University, Minsk, Belarus

Session D-5
Upconversion Materials

D-5:IL01 **Transparent Glass-ceramics Produced by Melting and Sol-gel. Crystallisation Mechanisms and Optical and Photonic Activity**
G. GORNI[1], J.J. VELÁZQUEZ[1], R. BALDA[2], J. FERNÁNDEZ[2], Y. CASTRO[1], M.J. PASCUAL[1], **A. DURAN**[1], [1]Instituto de Cerámica y Vidrio (CSIC), Madrid, Spain; [2]Dep. Física Aplicada I, Escuela Superior de Ingenieros, Bilbao, Spain

D-5:IL02 **Plasmon Enhanced Luminescence Upconversion**
WON PARK, University of Colorado Boulder, Boulder, CO, USA

D-5:L03 **Counterintuitive Optimization of Upconverting Nanocrystals for Single Particle Imaging**
B.E. COHEN, E. CHAN, D. GARGAS, P.J. SCHUCK, The Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

D-5:L04 **Synthesis and Characterization of Bright Up-conversion Phosphor YTa7O19**
SAKAYA TAMURA, K. TOMITA, Tokai University, Kanagawa, Japan; K. KATAGIRI, Hiroshima University, Hiroshima, Japan; M. KOBAYASHI, M. KAKIHANA, Tohoku University, Miyagi, Japan

Session D-6
Optical Fibers; Sensing and Imaging

D-6:IL01 **Luminescent Optical Fibers**
D. DOROSZ, J. ZMOJDA, M. KOCHNOWICZ, P. MILUSKI, Bialystok University of Technology, Bialystok, Poland; J. PISARSKA, W. PISARSKI, University of Silesia, Katowice, Poland; M. FERRARI, IFN-CNR CSMFO Lab. & FBK CMM, Povo, Trento, Italy; G.C. RIGHINI, IFAC-CNR, Sesto Fiorentino, Italy

D-6:IL02 **Performances and Applications of Rare-earth Doped Silica-based Scintillating Fibers**
A. VEDDA, Department of Materials Science, University of Milano-Bicocca, Milano Italy

D-6:IL03 **Versatile Lithium Fluoride Luminescent Detectors for High Resolution Imaging Applications from Extreme-ultraviolet to Soft and Hard X-rays**
F. BONFIGLI, R.M. MONTEREALI, M.A. VINCENTI, ENEA C.R. Frascati, Photonic Micro and Nanostructures Laboratory, FSN-TECFIS-MNF, Frascati (Rome), Italy; E. NICHELATTI, ENEA C.R. Casaccia, Photonic Micro and Nanostructures Laboratory, FSN-TECFIS-MNF, S. Maria di Galeria (Rome), Italy

D-6:L05 **Preparation and Investigation of Pr(3+)-doped Ge-As-Se-Ga(In) Glass Fibers with Broadband Mid-infrared Emission**
E.V. KARAKSINA, V.S. SHIRYAEV, M.F. CHURBANOV, G.E. SNOPATIN, T.V. KOTEREVA, Institute of Chemistry of High-Purity Substances of RAS, Nizhny Novgorod, Russia

D-6:L06 **Phosphors with Irreversible Phase Transitions for Thermal Sensor Applications**
G. SALEK, A. DEMOURGUES, A. GARCIA, V. JUBERA, **M. GAUDON**, ICMCB-CNRS 9048, Pessac, France

D-6:L07 **Gas Effects on the Electrical and Photoluminescence Properties of Individual ZnO Nanowire**
F. RIGONI, C. BARATTO, M. DONARELLI, A. PONZONI, E. COMINI, G. SBERVEGLIERI, G. FAGLIA, Sensor Lab, Department of Information Engineering, University of Brescia & CNR-INO, Brescia, Italy

Session D-7
New Synthesis and Processing Methods

D-7:IL01 **Activator-doped Amorphous Materials for Luminescent Application**
HIROKAZU MASAI, Institute for Chemical Research, Kyoto University, Uji, Kyoto, Japan

D-7:L02 **Microwave Synthesis and Structural Investigation of Nano-Interlanthanide Oxides**
J.C. SOARES[1], K.P. FÉLIX SIQUEIRA[1], R.L. MOREIRA[2], **A. DIAS**[1], [1]Department of Chemistry, Universidade Federal de Ouro Preto, ICEB, Ouro Preto-MG, Brazil; [2]Department of Physics, Universidade Federal de Minas Gerais, Belo Horizonte-MG, Brazil

D-7:L03 **Silicon Oxycarbides with Transparency and Photoluminescence**
MASAKI NARISAWA, H. INOUE, Graduate School of Engineering, Osaka Prefecture University, Sakai, Japan; F. FUNABIKI, Material Research Center of Elemental Strategy, Tokyo Institute of Technology, Yokohama, Japan; T. KAWAI, Graduate School of Science, Osaka Prefecture University, Sakai, Japan; H. HOSONO, Materials and Structure Laboratory, Tokyo Institute of Technology, Yokohama, Japan

D-7:IL04 **Three Primary Color Emission Up-conversion Phosphors for 3D Volume Display**
KOJI TOMITA, S. TAMURA, M. TANAKA, Tokai University, Kanagawa, Japan; Y. SATO, Okayama University of Science, Okayama, Japan; M. KOBAYASHI, M. KAKIHANA, Tohoku University, Miyagi, Japan

D-7:L05 **Growth Kinetics of Colloidal CdSe Nanocrystals: Size and Size Distribution Control**
E.A. SLEJKO, V. LUGHI, University of Trieste, Department of Engineering and Architecture, Trieste, Italy

D-7:IL06 **Large-area Luminescent Phosphor Sheets for Lighting and Display Applications**
H. MENKARA, PhosphorTech, Kennesaw, GA, USA

D-7:IL07 **Review of Phosphor Identification and Synthesis Methods**
J. McKITTRICK[1], JUNGMIN HA[2], ZHENBIN WANG[3], G.A. HIRATA[4], O.A. GRAEVE[1], SHYUE PING ONG[3], [1]Dept. of Mechanical and Aerospace Engineering and Materials Science and Engineering Program, University of California, La Jolla, CA, USA; [2]Materials Science and Engineering Program, University of California, La Jolla, CA, USA; [3]Dept. Of Nanoengineering and Materials Science and Engineering Program, University of California, La Jolla, CA, USA; [4]Center for Nanoscience and Nanotechnology, Ensenada, B.C. México

D-7:L08 **Fabricating Glasses with High Refractive Index and Strong Upconversion Luminescence using Containerless Processing**
J. YU, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, P.R. China

D-7:L09 **Synthesis of Ce:YAG Nanoparticles via the Formation of Urea Complexes**
M.L. SALADINO[1,2], F. ARMETTA[2], C. GIORDANO[3], E. CAPONETTI[1,2], [1]Dipartimento Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche - STEBICEF, Università di Palermo, Palermo, Italy; [2]Centro Grandi Apparecchiature-UniNetLab, Università di Palermo, Palermo, Italy; [3]Stranski-Laboratorium für Physikalische und Theoretische Chemie, Institut für Chemie, Technische Universität Berlin, Berlin, Germany

Session D-8

Advances in Characterization Techniques; Light Management for Active Applications

D-8:L01 **Energy Transfer Probing of Nd3+ Doped Fluorescent Nanoparticles as an Agent for Near IR Bioimaging**
Y. ORLOVSKII[1,2], A. VANETSEV[1], K. KALDVEE[1], E. SAMSONOVA[1], I. SILDOS[1], [1]Institute of Physics, University of Tartu, Tartu, Estonia; [2]Prokhorov General Physics Institute RAS, Russia, Moscow

D-8:IL02 **Autocorrelation Analysis for the Unbiased Determination of Power-Law Exponents in Single-Quantum-Dot Blinking**
J. HOUEL, G. LEDOUX, D. AMANS, A. AUBRET, C. DUJARDIN, F. KULZER, Institut Lumière-Matière, CNRS UMR5306, Université Lyon 1, Université de Lyon, Villeurbanne CEDEX, France; Q.T. DOAN, T. CAJFINGER, A. DOMINJON, S.FERRIOL, R. BARBIER, Institut de Physique Nucléaire de Lyon, CNRS UMR5822, Université Lyon 1, Université de Lyon, Villeurbanne Cedex, France; M. NASILOWSKI, E. LHUILLIER, B. DUBERTRET, ESPCIParisTech, PSL Research University, CNRS, Sorbonnes Université, UPMC Paris VI, Paris, France

D-8:IL03 **Simultaneous Vibrational and Optical Spectroscopy for the Study of the Local Structure and Optical Properties of Luminescent Ions in Phosphors**
M. KARLSSON, Chalmers University of Technology, Goteborg, Sweden

D-8:IL04 **Photon Management with Luminescence Structures**
S. NORMANI, M. SALHI, A. BRAUD, J.L. DOUALAN, R. MONCORGÉ, G. BRASSE, **P. CAMY**, CIMAP, Caen, France

D-8:L05 **Synthesis and Luminescence Properties of Ce doped LiCaPO4 Phosphor for Radiation Dosimetry**
S.K. OMANWAR, C.B. PALAN, N.S. BAJAJ, Department of Physics, Sant Gadge Baba Amravati University, Amravati, India

Session D-9

Methods to Integrate Luminescent Materials in a Device

D-9:IL01 **Electrophoretic Deposition of Phosphors for Solid-state Lighting**
J.B. TALBOT, Dept. of NanoEngineering, University of California, San Diego, La Jolla, CA, USA

D-9:IL03 **Temperature Sensing via Downconversion Luminescence of Lanthanide Doped Metal Oxides**
M.D. DRAMICANIN, University of Belgrade, Vinča Institute of Nuclear Sciences, Belgrade, Serbia

Session D-10

Medical Applications and Bioimaging

D-10:IL02 **Design, Functionalization and Use of Persistent Luminescence Nanocrystals**
E. TESTON, T. MALDINEY, J. SEGUIN, N. MIGNET, D. SCHERMAN, **C. RICHARD**, Unité de Technologies Chimiques et Biologiques pour la Santé; UMR 8258 CNRS; U 1022 Inserm; Université Paris Descartes, Faculté des Sciences Pharmaceutiques et Biologiques, Paris, France; Chimie-ParisTech, Paris, France

D-10:IL03 **Inorganic Fluorescent Materials for Biophotonics in the Second Biological Window**
KOHEI SODA, Department of Materials Science and Technology, Tokyo University of Science, Tokyo, Japan Imaging Frontier Center, Tokyo University of Science, Tokyo, Japan

D-10:IL04 **Photoluminescent Color Center-based Lithium Fluoride Radiation Detectors for Proton Beam Diagnostics**
M. PICCININI, A. AMPOLLINI, L. PICARDI, C. RONSIVALLE, M. VADRUCCI, F. BONFIGLI, S. LIBERA, E. NICHELATTI, M.A. VINCENTI, R.M. MONTEREALI, ENEA, C.R. Frascati, FSN-TECFIS, Frascati (RM), Italy

Poster Presentations

D:P01 **FRET between Inorganic Luminescent Quantum Dots and New Novel Organic Fluorescent Derivative**
G.H. PUJAR[1], N. DESHAPANDE[2], I.M. KHAZI[2], S.R. INAMDAR[1], [1]Laser Spectroscopy Programme, Department of Physics, and UGC-CPEPA, Karnatak University, Dharwad, India; [2]CPEPA, Department of Chemistry, Karnatak University, Dharwad, Karnataka, India

D:P02 **Application of Trimethoxypropylsilane-modified Silicon Nano-phosphors as a Spectral Converter on Silicon Solar Cells**
JOON-SUH PARK, IL KI HAN,YOUNG I. JHON, YOUNG MIN JHON, **WOON JO CHO**, Korea Institute of Science and Technology, Seoul, Republic of Korea; SOO JIN LEE, Department of Nuclear Medicine, National Cancer Center, Goyang-si Gyeonggi-do, Republic of Korea

D:P03 **Luminescent Probing of the Temperature Influence on Plasmonic Field of Metal Nanoparticles in Layered C60/Au System**
O.A. YESHCHENKO, I.S. BONDARCHUK, V.V. KOZACHENKO, M.YU. LOSYTSKYY, Physics Department, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

D:P04 **Optically Transparent Ceramics and Phase Relations in the La2O3-Y2O3-Ln2O3 Systems**
E.R. ANDRIEVSKAYA[1], O.V. CHUDINOVICH[1], A. SAYIR[3], [1]Institute of Materials Science Problems, National Ukrainian Academy of Sciences, Kiev, Ukraine; [2]National Technical University Kiev Polytechnic Institute, Kiev, Ukraine; [3]Air Force Research Laboratory, Wright-Patterson Base, Dayton, USA

D:P05 **Surface Modification of Synthesized Zirconia by Attachment of Silane Coupling Agent for making Transparency Films with High Refractive Index**
KI JU KANG[1,2], HEE SEON LEE[1,2], JUNG WHAN YOO[1], [1]Eco Composite Materials Team, Korea Institute of Ceramic Engineering & Technology, Jinju, Korea; [2]Department of Material Engineering, GyeongSang University, Korea

D:P06 **Effect of Process Parameters on Luminescent Properties of Eu,Tb,Tm Codoped CaMoO4 Thin Films**
A.P.A. MARQUES, A.S.M. CHARALABOPOULOS, F.S. TAVARES, UNIFESP, Diadema, SP, Brasil; F. V. MOTTA, UFRN, Natal, RN, Brasil; M.S. LI, USP, São Carlos, SP, Brasil; E. LONGO, UFSCar, São Carlos, SP, Brasil

D:P07 **Study of Optical Band Gap and Fluorescence Decay Time in BaMg2Al6Si9O30 : Ce3+ /Dy3+ Nanophosphor**
V. PAWADE, Department of Applied-Physics, Laxminarayan Institute of Technology, and Department of Physics, R.T.M. Nagpur University, Nagpur, India

D:P08 **Luminescent Fluorine Phosphate Glasses Doped with CdS CdSe, PbSe and PbS Molecular Clusters and Quantum Dots for Lighting and Solar Cells Converters**
E. KOLOBKOVA, ZH. LIPATOVA, N. NIKONOROV, St. Petersburg, ITMO University, Saint-Petersburg, Russia

D:P09 **Luminescence Properties of Red Emitting Phosphor Ba2ZnS3:xMn2+ Prepared with Novel Modified Wet-chemical Synthesis Method**
D. CHIKTE (AWADE)[1], V. R. RAIKWAR[2], S.K. OMANWAR[3], S.V. MOHARIL[4], [1]Department of Physics, G.N. Khalsa College, Matunga, Mumbai, India; [2]Department of Physics, R.J. College, Ghatkopar, Mumbai, India; [3]Department of Physics, Shri Shivaji Science College, Amravati, India; [4]Department of Physics, R.T.M Nagpur Universit, Nagpur, India

D:P10 **Morphological and Luminescent Studies on Novel Lead Calcium Diborate Doped with Tb3+**
V.R. RAIKWAR[1], D. AWADE[2], V.B. BHATKAR[3], S.K. OMANWAR[4], [1]Department of Physics, R.J. College, Ghatkopar, Mumbai, India; [2]Department of Physics, G.N. Khalsa College, Matunga, Mumbai, India; [3]Department of Physics, Shri Shivaji Science College, Amravati, India; [4]Department of Physics, SGB Amravati University, Amravati, India

D:P11 **Synthesis of CexLu3-xMgAl3SiO12 Yellow Phosphors and their Optical Properties**
JUNG-IL LEE, **JEONG HO RYU**, Dept.of Materials Science and Engineering, Korea National University of Transportation, Chungju, Chungbuk, Korea

D:P12 **Influence of Pluronic P123 in modifying the Morphological and Optical Properties of PbS Nanoparticles**
T.M. HAMMAD, Physics Department, Faculty of Science, Al Azhar University, Gaza, Palestine

D:P13 **Photoluminescence Study of LaPO4:Ce3+ and LaPO4:Ce3+, RE (RE= Nd3+ & Yb3+) Phosphors**
K.A. KOPARKAR[1], N.S. SAWALA[1], N.S. BAJAJ[2], S.K. OMANWAR[1], [1]Department of Physics, Sant Gadge Baba Amravati University, Amravati (MH), India; [2]Department of Physics, Toshniwal Art, Commerce and Science College, Sengoan, Hingoli (MH), India

D:P14 **Combinatorial Search of Y(P, V, Nb)O4:Bi3+, Dy3+ for White-light Lamp Phosphor**
S.R. JAISWAL[1], K.A. KOPARKAR[1], V.B. BHATKAR[2], S.K. OMANWAR[1], [1]Department of Physics, Sant Gadge Baba Amravati University, Amravati, India; [2]Department of Physics, Shri Shivaji Science College, Amravati, India

D:P15 **Preparation and Photoluminescence Property of Eu Doped YVO4 Nanofibers by Electrospinning**
N.S. BAJAJ, V.S. HINGWE, S.K. OMANWAR, Department of Physics SGB Amravati University, Amravati, India

D:P16 **Spectral Characteristics of the Nanophosphors Derived on Sr2Gd8(SiO4)6O2: Eu Polycrystals**
S.Yu. SOKOVNIN, M.G. ZUEV, V.G. IL'VES, Institute of Solid State Chemistry, Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russia Institute of Electrophysics, Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russia Ural Federal University, Ekaterinburg, Russia

D:P17 **Crystallinity and Photoluminescence Improvement of YAG:Ce Phosphor Ceramics by Solid State Reaction with Silica**
YUNG-TANG NIEN, National Formosa University, Yunlin County, Taiwan

D:P18 **White Light Generation in Single-phase Tungstate Based Phosphors**
S. MOORTHY BABU, D. BALAJI, K. KAVI RASU, Crystal Growth Centre, Anna University, Chennai, India

D:P19 **Study in Optical Property Evaluation of Individual Multi-shell Quantum Dots by TEM-EELS**
MASATO UEHARA, AIST, Tosu, Japan; Y. SATO, N. NAKAHIGASHI, M. TERAUCHI, Tohoku University, Sendai, Japan

D:P20 **Influence of Sr2+ Content on Luminescence Characteristics of Pb2+ in (BaSr)2Mg(BO3)2**
A.B. GAWANDE, S.K. OMANWAR, Department of Physics, SGB Amravati University, Amravati (M.S.), India

D:P21 **Crystal Orientation and Grains Morphology in Polycrystalline YAP Ceramics**
D. MICHALIK, T. PAWLIK, B. CHMIELA, Silesian University of Technology, Katowice, Poland

D:P22 **SiO2:Eu Prepared by Spark Plasma Sintering for Radiation Measurements**
G. OKADA, T. YANAGIDA, Graduate School of Materials Science, Nara Institute of Science and Technology, Ikoma, Nara, Japan

D:P24 **Quantum Dot/Matrix Nanostructures for Upconversion Layers: A Fully Colloidal Synthesis**
L. COZZARINI, E.A. SLEJKO, **V. LUGHI**, University of Trieste, Department of Engineering and Architecture, Trieste, Italy

D:P25 **A click-derived Dual Organic-inorganic Hybrid Optical Sensor Based on SBA-15 for Selectively Recognition of Zn2+ and CN- in Water**
M. KARIMI, A. BADIEI, GHODSI MOHAMMADI ZIARANI, School of Chemistry, College of Science, University of Tehran, Tehran, Iran; Department of Chemistry, Faculty of Science, Alzahra University, Tehran, Iran

D:P26 **Solid State Synthesis of SrSi2O2N2:Eu^{2+} Powder in Flowing Nitrogen**
T. PAWLIK, D. MICHALIK, M. SOPICKA-LIZER, Silesian University of Technology, Katowice, Poland

D:P27 **Spark Plasma Sintering and Optical Properties of ZnS Nanoparticles Prepared by Hydrothermal Synthesis**
YOUN-WOO HONG, Y.B. KIM, T.H. SHIN, J.H. PAIK, KICET, Jinju-si, Gyeongsangnam-do, South Korea

D:P28 **Photoluminescent and Photocatalytic Properties of CaIn2O4:Eu Nanocrystals**
F.V. MOTTA[1], M.T.S. TAVARES[2], R.L. TRANQUILIN[1], A.P.A. MARQUE[3], C.R.R. ALMEIDA[1], C.A. PASKOCIMAS[1], M.R.D. BOMIO[1], E. LONGO[4], [1]LSQM- Lab. de Síntese Química de Materiais - DEMAT, UFRN, Natal, Campus Lagoa Nova, Natal / RN, Brazil; [2]IFBA, Campus Feira de Santana, Bahia / BA, Brazil; [3]UNIFESP, Diadema, SP, Brasil; [4]LIEC- DQ, UFSCar, São Carlos / SP, Brazil

D:P29 **Encapsulation of Oxynitride Phosphors into Sintered Na2O-ZnO-B2O3-P2O5 Glass Body**
NANAKO AKIYAMA[1], H.T. HINTZEN[2], K. ITATANI[1], [1]Department of Materials and Life Sciences, Sophia University, Tokyo, Japan; [2]Faculty of Applied Science, Delft University of Technology, Delft, The Netherlands

D:P30 **Combustion Synthesis and VUV Investigation of MAl12O19: Eu (M = Ca, Sr, Ba) Phosphors**
G.V. KORPE[1], R.N. WANKHADE[2], N.S. BAJAJ[2], V.B. BHATKAR[3], S.K. OMANWAR[2], [1]Department of Chemistry, Shri Shivaji College, Akola (MS), India; [2]Department of Physics, S.G.B.A. University, Amravati (MS), India; [3]Department of Physics, Shri Shivaji Science College, Amravati, (MH), India

D:P31 **Synthesis and Characterization of Lanthanide Metal-organic Frameworks with Perfluorinated Linkers**
A. LAURIKENAS, J. BARKAUSKAS, A. KAREIVA, Department of Inorganic Chemistry, Vilnius University, Vilnius, Lithuania

D:P32 **Synthesis and Photoluminescent Properties of TiO2 and TiO2:Ag Nanoparticles**
A.P. DE MOURA, L.H. DE OLIVEIRA, E. LONGO, J.A. VARELA, Universidade Estadual Paulista, Institute of Chemistry, LIEC, Araraquara, SP, Brazil; I.L.V. ROSA, E.S. JUNIOR, M.S. LI, Universidade Federal de São Carlos, Department of Chemistry, LIEC, São Carlos, SP, Brazil

D:P33 **Synthesis and Characterization of PLD Glass Phosphate Films doped with CdS Powder**
M. ELISA, I.C. VASILIU, I.D. FERARU, R. IORDANESCU, National Institute of R&D for Optoelectronics INOE 2000, Magurele, Jud. Ilfov, Romania; G. EPURESCU, M. FILIPESCU, National Institute for Laser, Plasma and Radiation Physics, Magurele, Jud. Ilfov, Romania; C. PLAPCIANU, C. BARTHA, M. ENCULESCU, National Institute of Materials Physics, Magurele, Jud. Ilfov, Romania; S. PERETZ, Institute of Physical Chemistry "I. Murgulescu", Romanian Academy, Bucharest, Romania

D:P34 **Development of Technology for Production of High Purity Rare Earth-ion Doped Chalcogenide Glasses for Active Fiber Optics**
V.S. SHIRYAEV, E.V. KARAKSINA, I.V. SKRIPACHEV, A,P. VELMUZHOV, Institute of Chemistry of High-Purity Substances of RAS, Nizhny Novgorod, Russia

D:P35 **Fabrication of Y3Al5O12:Ce3+ Phosphor in Glass for High-power Remote Phosphor LED**
JUNG SIK JOO, JOO HYUN LEE, **HYUN KYOUNG YANG**, Department of LED Convergence Engineering, Pukyong National University, Busan, Republic of Korea

D:P37 **Synthesis and Photoluminescence Characteristics of the Gd3+ doped SrB4O7 Phosphor**
A.O. CHAUHAN[1], S.K. OMANWAR[1], N.S. BAJAJ[2], K.A. KOPARKAR[1], [1]Sant Gadge Baba Amravati University, Amravati (MH), India; [2]Toshnival ACS college, Sengaon, Hingoli (MH), India

D:P38 **Study on Thermal Performance of Cool Paints mixed with Modified Mica**
JEONG MIN PARK[1], KI JU KANG[1,2], **JUNG WHAN YOO**[1], [1]Composite Materials Team, Korea Institute of Ceramic Engineering and Technology, Jinju, Korea; [2]Department of Material Engineering, Gyeongsang University, Korea

D:P39 **An Automated Approach to Identify Semiconductor Properties**
P.A. NARDI, Universidade Tecnológica Federal do Paraná, Departamento Acadêmico de Computação (DACOM), Cornélio Procópio, PR, Brazil; F.A. AOUADA, Universidade Estadual Paulista, Departamento de Físico-Química (DFQ), Ilha Solteira, SP, Brazil

D:P40 **Thermoluminescence of LaAlO3: Pr3+ Beta Irradiated**
M.A. DE LEON, S. DEL SOL, R. GARCÍA, T. RIVERA, CICATA-Legaria del IPN, México, D.F. México; A. MORALES, A. BARRERA, J. ZARATE, IIMM-UMSNH, Morelia, Mich., México; E. YUKIHARA, Oklahoma State University. Stillwater, OK, USA

D:P41 **Synthesis and Photoluminescence of LaAlO3:Dy3+ Polycrystalline**
T. RIVERA, M.A. DE LEÓN, R. ALVAREZ, CICATA-Legaria del IPN, México, D.F. México; A. MORALES, A. BARRERA, J. ZARATE, IIMM-UMSNH, Morelia, Mich., México; C. FALCONY, CINVESTAV-IPN, México D.F., México

D:P42 **YAGG:Cr3+ as NIR Persistent Phosphor for In Vivo Imaging**
O.Q. DE CLERCQ, J.H. BOUMAN, P.F. SMET, D. POELMAN, Lumilab, Ghent University, Ghent, Belgium; K. BRAECKMANS, Bio-Photonic Imaging Group, Ghent University, Ghent, Belgium

SYMPOSIUM E
PROGRESS IN METAMATERIALS RESEARCH

Oral Presentations

Session E-1
Physics and Modelling of Metamaterials Systems

E-1:IL01 **Some Perspectives in Non-Hermitian Metamaterials**
V. GALDI, University of Sannio, Benevento, Italy

E-1:L02 **Metamaterial Properties of Magnetic Nanostructures**
R. ZIVIERI, Department of Physics and Earth Sciences, University of Ferrara, Ferrara, Italy

E-1:L03 **Validity of Effective Medium Approximation in Deeply Subwavelength All-dielectric Multilayers**
A.V. LAVRINENKO, S.V. ZHUKOVSKY, A. ANDRYIEUSKI, O. TAKAYAMA, E. SHKONDIN, R. MALUREANU, F. JENSEN, Technical University of Denmark, Kgs. Lyngby, Denmark

E-1:L04 **Metamaterial Properties of a 2D Magnonic Crystal**
P. MALAGO', Dipartimento di Fisica e Scienze della Terra, Università di Ferrara, Ferrara, Italy

Session E-2
Microwave and THz Metamaterials

E-2:IL01 **Digital Metamaterials for Terahertz Single Pixel Imaging**
W.J. PADILLA, Duke University, Department of Electrical and Computer Engineering, Durham, NC, USA

E-2:L03 **Enhanced Chirality in the Near-field of Electromagnetic Metamaterials**
L.E. BARR, A.P. HIBBINS, E. HENDRY, XM2 Centre for Doctoral Training in Metamaterials, University of Exeter, Exeter, Devon, UK

E-2:L04 **RF Plasmonic State and Negative Permittivity Properties of Random Percolative Composites**
RUNHUA FAN, College of Ocean Science and Engineering, Shanghai Maritime University, Shanghai, P.R.China; and School of Material Science and Engineering, Shandong University, Jinan, P.R. China

E-2:L05 **Mode Index Tunable Moiré Pattern Metasurfaces**
R.C. MITCHELL-THOMAS, J.R. SAMBLES, A.P. HIBBINS, Electromagnetic and Acoustic Materials Group, Department of Physics and Astronomy, University of Exeter, Stocker Road, Exeter, UK

E-2:IL06 **THz and Far-IR Control with Chiral and Bianisotropic Metamaterials**
M. KAFESAKI, A. XOMALIS, E.N. ECONOMOU, Foundation for Research and Technology Hellas (FORTH) and University of Crete, Heraklion, Greece; G. KENANAKIS, M. FARSARI, G. KONSTANTINIDIS, FORTH, Heraklion, Greece; C. M. SOUKOULIS, FORTH, Greece, and Iowa State University, Iowa, USA

E-2:IL08 **Metasurfaces with Electric, Magnetic and Magneto-electric Properties**
A. GRBIC, B. TIERNEY, C. PFEIFFER, Dept. of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI, USA

E-2:L09 **Resonant Transmission through Thin Metal Layers using Two Dimensional Arrays**
M. CAMACHO-AGUILAR, A.P. HIBBINS, J.R. SAMBLES, University of Exeter, Exeter, UK

E-2:L10 **Exploring the Interactions in Systems of Densely Packed Split Ring Resonators**
S. SEETHARAMAN, I.R. HOOPER, W.L. BARNES, College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, Devon, UK

Session E-3
All-dielectric Metamaterials and Metasurfaces

E-3:IL01 **High Quality Factor Silicon-based Metasurfaces**
J. VALENTINE, YUANMU YANG, Vanderbilt University, Nashville, TN, USA; A. BOULESBAA, I.I. KRAVCHENKO, D.P. BRIGGS, A. PURETZKY, D. GEOHEGAN, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN, USA

E-3:IL02 **Dielectric Nanoantennas and Metasurfaces based on Si Nanoparticles**
A.I. KUZNETSOV, Data Storage Institute, A*STAR, Innovis, Singapore

E-3:IL03 **Resonant Dielectric Huygens' Metasurfaces**
I. STAUDE, Institute of Applied Physics, Abbe Center of Photonics, Friedrich-Schiller-University Jena, Jena, Germany; K.E. CHONG, M. DECKER, D.N. NESHEV, Nonlinear Physics Centre, Research School of Physics and Engineering, Australian National University, Canberra, ACT, Australia; I. BRENER, Center for Integrated Nanotechnologies, Sandia National Laboratories, Albuquerque, NM, USA; YU. S. KIVSHAR, Nonlinear Physics Centre, Research School of Physics and Engineering, Australian National University, Canberra, ACT, Australia

Session E-4
Nonlinear, Tunable and Active Metamaterials

E-4:IL01 **Broadband Terahertz Generation from Metamaterials and Optical Metamaterials Resonances with High Quality Factor**
C.M. SOUKOULIS, Ames Laboratory, and Dept. of Physics, Iowa State University, Ames, Iowa, USA Institute of Electronic Structure and Laser, FORTH, Heraklion, Crete, Greece

E-4:IL02 **Optimizing the Second Harmonic Chiroptical Effects in Plasmonic Nanostructures**
V.K. VALEV, Department of Physics, University of Bath, Bath, UK

E-4:IL03 **Thermally Tunable Self-assembled Metamaterials**
C. ROCKSTUHL, Institute of Theoretical Solid State Physics, Institute of Nanotechnology, Karlsruhe Institute of Technology, Karlsruhe, Germany; M. FRUHNERT, Institute of Theoretical Solid State Physics, Karlsruhe Institute of Technology, Karlsruhe, Germany; W. LEWANDOWSKI, J. MIECZKOWSKI, E. GÓRECKA, Faculty of Chemistry, University of Warsaw, Warsaw, Poland

E-4:IL04 **Tunable Metamaterials: Conceptual Overview and Recent Highlights**
M. LAPINE, University of Technology Sydney, NSW, Australia

E-4:IL05 **Enhanced Optical Nonlinearities from Metasurfaces Coupled to Semiconductors**
I. BRENER, Sandia National Labs and Center for Integrated Nanotechnologies, Albuquerque, NM, USA

E-4:IL06 **Nonlinear and Tunable Metamaterials**
MINGKAI LIU[1], KEBIN FAN[2], W. PADILLA[2], D.A. POWELL[1], XIN ZHANG[3], **I.V. SHADRIVOV**[1], [1]Nonlinear Physics Centre, Research School of Physics and Engineering, Australian National University, Canberra ACT, Australia; [2]Duke University Department of Electrical & Computer Engineering, Durham NC, USA; [3]Department of Mechanical Engineering, Boston University, Boston, MA, USA

E-4:IL07 **Alternative Materials and Solutions for Next Generation Plasmonic Technology**
M. FERRERA, School of Electrical and Computer Engineering and Birck Nanotechnology Center, Purdue University, West Lafayette, IN, USA, & School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, Scotland, UK

E-4:L08 **Tree-wave Mixing Metamirror: Extraordinary Transients**
VV. SLABKO, V.A. TKACHENKO, Siberian Federal University, Krasnoyarsk, Russia; S.A. MYSLIVETS, Institute of Physics of Siberian Branch of the Russian Academy of Sciences, Krasnoyarsk, Russia; **A.K. POPOV**, Birck Nanotechnology Center, Purdue University, IN, USA

Session E-5
Applications of Metamaterials and Metadevices

E-5:IL01 **Optomechanical Metamaterials**
E. VERHAGEN, FOM Institute AMOLF, Amsterdam, The Netherlands

E-5:IL02 **Metamaterial based Nanobiosensors and Nanophotodetectors**
E. OZBAY, Nanotechnology Research Center, Bilkent University, Bilkent, Ankara, Turkey

E-5:IL03 **Metamaterials as a Platform to study Localised and Propagating Toroidal Excitations**
N.I. ZHELUDEV, V.A. FEDOTOV, N. PAPASIMAKIS, V. SAVINOV, **T.A. RAYBOULD**, University of Southampton, Southampton, UK

E-5:L04 **A Novel Metamaterial-based Sensor for Nonlinear Elastic Detection and Localization**
M. MINIACI, A. KRUSHYNSKA, F. BOSIA, Department of Physics, University of Torino, Torino, Italy; A. GLIOZZI, M. SCALERANDI, Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy; B. MORVAN, LOMC UMR CNRS 6294, Université du Havre, Le Havre, France; N.M. PUGNO, Laboratory of Bio-Inspired & Graphene Nanomechanics, Department of Civil, Environmental and Mechanical Engineering - University of Trento, Trento, Italy

E-5:L06 **High Temperature Stability of Oxide Photonic Structures**
R. JANSSEN[1], R. PASQUARELLI[1], P.N. DYACHENKO[2], A. PETROV[2], M. EICH[2], [1]Institute of Advanced Ceramics and [2]Institute of Optical and Electronic Materials, Technische Universität Hamburg-Harburg, Germany

Session E-6

Antenna, Nanoantenna and Waveguide Applications, Transformation Optics, Superlenses

E-6:IL01 **Plasmonic Waveguides: Challenges and Perspectives**
S. BOZHEVOLNYI, Department of Technology and Innovation, University of Southern Denmark, Odense M, Denmark

E-6:IL02 **Transformation Optical Applications with Pseudo-magnetic Field**
JENSEN LI, University of Birmingham, School of Physics and Astronomy, Birmingham, UK

E-6:L03 **Imaging and Spectroscopy of Plasmonic and Phonon Polariton Modes with the Photothermal Induced Resonance (PTIR) Technique**
A. CENTRONE, National Institute of Standard and Technology, Gaithersburg, MD, USA

E-6:IL04 **Optical Antennas**
M. AGIO, Laboratory of Nano-Optics, University of Siegen, Siegen, Germany

E-6:IL05 **Integrated Hyperlens in the Visible Spectral Range**
N.M. LITCHINITSER, JINGBO SUN, M.I. SHALAEV, University at Buffalo, The State University of New York, Buffalo, NY, USA

E-6:L06 **Nanoantenna-based Stokes Polarimeter on a Silicon Chip**
A. ESPINOSA-SORIA, Nanophotonics Technology Center, Universitat Politècnica de València, Valencia, Spain; F.J. RODRÍGUEZ-FORTUÑO, King's College London, London, UK; A. GRIOL, A. MARTÍNEZ, Nanophotonics Technology Center, Universitat Politècnica de València, Valencia, Spain

Session E-7

Acoustic and Mechanical Metamaterials

E-7:IL01 **Acoustic and Elastic Metamaterials for Earthquake Cloaking**
A. DIATTA, Y. ACHAOUI, B. UNGUREANU, S. BRULE, S. ENOCH, **S. GUENNEAU**, Aix-Marseille Université, CNRS, Centrale Marseille, Institut Fresnel, Marseille, France

E-7:L02 **Direct Observation of Ultrasonic Cut-off Frequency for Holes with Pressure-release Walls**
T. GRAHAM, Department of Physics and Astronomy, University of Exeter, Exeter, UK

E-7:L03 **Nonlinear Vibration Damping in Mechanical/Electrical Periodic Structures Featuring Switched Piezoelectric Elements**
BIN BAO, M. LALLART, D. GUYOMAR, Laboratoire de Génie Electrique et Ferroélectricité, INSA de Lyon, Villeurbanne Cedex, France

E-7:L04 **Mechanical Metamaterials with Hierarchical Structure**
A. KRUSHYNSKA, M. MINIACI, F. BOSIA, Department of Physics, University of Torino, Torino, Italy; B. MORVAN, LOMC UMR CNRS 6294, Université du Havre, Le Havre, France; N.M. PUGNO, Laboratory of Bio-Inspired & Graphene Nanomechanics, Department of Civil, Environmental and Mechanical Engineering - University of Trento, Trento, Italy

E-7:IL05 **Parity-time Synthetic Phononic Media**
J. CHRISTENSEN, M. WILLATZEN, DTU, Kgs. Lyngby, Denmark

E-7:L06 **Boundary Layer Effects on Acoustic Transmission Through Narrow Slit-cavities**
G.P. WARD, R.K.LOVELOCK, A.R.J. MURRAY, A.P. HIBBINS, J.R. SAMBLES, J.D. SMITH, Exeter University, Exeter, Devon, UK

E-7:L07 **Removable Tsunami Wall made of Meta-lens Arrays**
SANG-HOON KIM, Division of Marine Engineering, Mokpo National Maritime University, Rep.of Korea

E-7:L08 **Effective Parameter Identification and Controller Design for an Active Mechanical Metamaterial**
S.A. POPE, Department of Automatic Control and Systems Engineering, The University of Sheffield, Sheffield, UK

E-7:L09 **Out-of-plane and In-plane Wave Band Gaps in a Metamaterial Rectangular Plate**
E.J.P. MIRANDA Jr., J.M.C. SANTOS, University of Campinas (Unicamp), Campinas, SP, Brazil

Session E-8

Novel Concepts and Applications of Metasurfaces and Metadevices

E-8:IL01 **Photonic Topological Insulators: Guiding Electromagnetic Waves Around Sharp Corners**
TZUHSUAN MA, KUEIFU LAI, **G. SHVETS**, University of Texas at Austin, Austin, TX, USA

E-8:IL02 **Photonic Spin Hall Effect with nearly 100% Efficiency based on Gradient Metasurface**
SHULIN SUN[1], WEIJIE LUO[2], SHIYI XIAO[2], QIONG HE[2,3], LEI ZHOU[2,3], [1]Shanghai Engineering Research Center of Ultra-Precision Optical Manufacturing, Green Photonics and Department of Optical Science and Engineering, Fudan University, Shanghai, China; [2]State Key Lab. of Surface Physics and Key Laboratory of Micro and Nano Photonic Structures (Ministry of Education), Fudan University, Shanghai, China; [3]Collaborative Innovation Center of Advanced Microstructures, Fudan University, Shanghai, China

E-8:IL03 **Topological Notions and Pseudo-spin in Electromagnetic Waves**
W.-J. CHEN[1], M. XIAO[1], Z.-Q. ZHANG[1], J.-W. DONG[2], C.T. CHAN[1], [1]Department of Physics and the Institute for Advanced Study, The Hong Kong University of Science and Technology, Hong Kong, China; [2]State Key Laboratory of Optoelectronic Materials and Technologies and School of Physics and Engineering, Sun Yat-Sen University, Guangzhou, China

E-8:L04 **Metastructures for Passive Broadband Vibration Suppression and Energy Harvesting**
J.D. HOBECK, D.J. INMAN, University of Michigan, Department of Aerospace Engineering, Ann Arbor, MI, USA

E-8:L05 **Application of Metamaterial Nanoengineering for Increase of Superconducting Critical Temperature**
V.N. SMOLYANINOVA[1], K. ZANDER[1], T. GRESOCK[1], C. JENSEN[1], J.C. PRESTIGIACOMO[2], M.S. OSOFSKY[2], I.I. SMOLYANINOV[3], [1]Department of Physics Astronomy and Geosciences, Towson University, Towson, MD, USA; [2]Naval Research Laboratory, Washington, DC, USA; [3]Department of Electrical and Computer Engineering, University of Maryland, College Park, MD, USA

Poster Presentations

E:P01 **A New Method to Fabricate Metamaterial Structures by Uniform Deposition of Metal or Alloy Nanofilms**
HEESOO PARK, B. HALL, **A. SIAHMAKOUN**, Dept. of Physics & Optical Engineering, Rose-Hulman Institute of Technology, Terre Haute, IN, USA

E:P02 **Group Velocity Anomaly Modes in Hybrid Bands in Photonic Crystals made of Ferroelectrics**
M.W. TAKEDA[1], M. ARIKAWA[1], R. ARAKI[1], Y. NAKATA[1], F. MIYAMARU[1,2], [1]Department of Physics, Faculty of Science, Shinshu University, Matsumoto, Japan; [2]Center for Energy and Environmental Science, Shinshu University, Nagano, Japan

E:P03 **Microwave Surface Waves on Graphene-like Metasurfaces**
Y.N. DAUTOVA, A.P. HIBBINS, J.R.SAMBLES, Department of Physics and Astronomy, University of Exeter, Stocker Road, Exeter, Devon, UK

E:P04 **Running Metal Soap**
KOYA HAYASHI, SUGURU MIYAHARA, GENTA SAKANE, Department of Chemistry Okayama University of Science, Okayama, Japan

SYMPOSIUM F
GRAPHENE AND OTHER EMERGING 2D-LAYERED NANOMATERIALS: SYNTHESIS, PROPERTIES AND POTENTIAL APPLICATIONS

Oral Presentations

Session F-1
General Physical and Chemical Properties

F-1:KL **2D Materials: Standards, Science, and Technology**
A.H. CASTRO NETO, National University of Singapore, Singapore

F-1:L01 **Optoelectronic Properties of Transition Metal Dichalcogenides**
L. BALICAS, **D. RHODES**, National High Magnetic Field Lab, Florida State University, Tallahassee, FL, USA

F-1:IL02 **Role of Edge Geometry and Chemistry in Electronic and Magnetic Structures of Nanographenes**
TOSHIAKI ENOKI, Tokyo Institute of Technology, Tokyo, Japan

F-1:IL03 **Raman Spectroscopy of Graphene-related Materials**
C. CASIRAGHI, School of Chemistry, University of Manchester, UK

F-1:L04 **Determining the Nature of the Gap in Semiconducting Graphene**
M.S. OSOFSKY[1], J. PRESTIGIACOMO[1]*, A. NATH[2], S.C. HERNANDEZ[1], V.D. WHEELER[1], S. WALTON[1], D.K. GASKILL[1], [1]Naval Research Laboratory, Washington, DC, USA; [2]George Mason University *NRC Postdoctoral Fellow

F-1:L05 **Understanding the Structural Evolution of Graphene Heated with Electrical Current in Air**
IN-SANG YANG, MINKYUNG CHOI, Ewha University, Korea; JANGYUP SON, JONGIN CHA, JONGILL HONG, Yonsei University, Korea; HEECHAE CHOI, SEUNGCHUL KIM, KWANG-RYEOL LEE, KIST, Korea; SANG JIN KIM, BYUNG HEE HONG, Seoul National University, Korea; SANPON VANTASIN, ICHIRO TANABE, YUKIHIRO OZAKI, Kwansei Gakuin University, Japan

F-1:L06 **Super-low Friction Property of Si-doped Diamond-like Carbon by the Generation of Graphene Structure: Quantum Chemical Molecular Dynamics Simulations**
M. KUBO, S. BAI, M. NAKAMURA, Y. HIGUCHI, N. OZAWA, Institute for Materials Research, Tohoku University, Sendai, Japan

F-1:IL07 **Emission and Detection of THz Radiation in Double-graphene-layered van der Waals Heterostructures via Photon-assisted Plasmonic Resonant Tunneling**
TAIICHI OTSUJI, Research Institute of Electrical Communication, Tohoku University, Sendai, Japan

F-1:L08 **Graphene-boron Nitride 2D Heterosystems Functionalized with Hydrogen: Structure, Vibrations, Optical Response and Electron Band Engineering and Bonding**
A.I. SHKREBTII, B. WILK, Z.A. IBRAHIM, R. MINNINGS, University of Ontario, Institute of Technology, Oshawa, ON, Canada; I.M. KUPCHAK, Institute of Semiconductor Physics, Academy of Sciences, Kiev, Ukraine; R. ZAPATA-PENÃ, S.M. ANDERSON, B.S. MENDOZA, Centro de Investigaciones en Óptica, León, Guanajuato, México

F-1:L09 **Electronic Structures of Two-dimensional Materials: Inorganic to Organometallic Materials Recently Synthesized**
FAZEL SHOJAEI, Department of Chemistry and Bioactive Material Sciences and Research Institute of Physics and Chemistry, Jeonbuk National University, South Korea; **HONG SEOK KANG**, Department of Nano and Advanced Materials, College of Engineering, Jeonju University, South Korea

F-1:L10 **Expanding the Range of Applications of AlN through its Scalability at the 2D Limit**
R.B. DOS SANTOS, R. RIVELINO, F. DE BRITO MOTA, Instituto de Física, Universidade Federal da Bahia, Salvador, Bahia, Brazil; A. KAKANAKOVA-GEORGIEVA, **G.K. GUEORGUIEV**, IFM, Linköping University, Linköping, Sweden

Session F-2
Novel Properties

F-2:KL **Charge and Spin in Layered Materials and Topological Insulators**
A. BANSIL, Physics Department, Northeastern University, Boston, MA, USA

F-2:IL01 **New Materials for Van der Waals Heterostructures**
R. GORBACHEV, School of Physics and Astronomy, University of Manchester, Manchester, UK

F-2:IL02 **Ultrafast Dynamics of Spin-valley Coupled Polarization in Monolayer MoS2**
CHIH-WEI LUO, Department of Electrophysics, National Chiao Tung University, Hsinchu, Taiwan

F-2:IL03 **Lateral Heterostructure Field Effect Transistors**
G. FIORI, G. IANNACCONE, Dipartimento Ingegneria dell'Informazione, University of Pisa, Pisa, Italy

F-2:IL04 **Spectral Response of 2D Materials based Photodiodes**
M. LEMME, Graphene-based Nanotechnology, University of Siegen, Siegen, Germany

F-2:IL05 **Ultrafast and Nonlinear Dynamics in 2D Materials and their Heterostructures**
K.M. DANI, Femtosecond Spectroscopy Unit, Okinawa Institute of Science and Technology Graduate University, Onna-son, Okinawa, Japan

F-2:IL06 **Quantum Confinement in Black Phosphorus through Strain-engineered Rippling**
J. QUEREDA[1], V. PARENTE[2], P. SAN-JOSÉ[3], N. AGRAÏT[1,2,4], G. RUBIO-BOLLINGER[1,4], F. GUINEA[2], R. ROLDÁN[2,3], **A. CASTELLANOS-GOMEZ**[2], [1]Dpto. de Física de la Materia Condensada, Universidad Autónoma de Madrid, Madrid, Spain; [2]Instituto Madrileño de Estudios Avanzados en Nanociencia (IMDEA-nanociencia), Campus de Cantoblanco, Madrid, Spain; [3]Instituto de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain; [4]Condensed Matter Physics Center (IFIMAC), Universidad Autónoma de Madrid, Madrid, Spain

F-2:L07 **Dynamics and Morphology of Folds and Wrinkles in Graphene, h-BN and 2D Talc**
H. CHACHAM, A.B. ALENCAR, A.P.M. BARBOZA, C.K. OLIVEIRA, A.L. LIMA, R.J.C. BATISTA, A. BARROS DE OLIVEIRA, B.R.A. NEVES, Department of Physics, Federal University of Minas Gerais, Belo Horizonte, MG, Brazil

Session F-3
Synthesis, Processing and Integration of Graphene and other 2D Layered Compounds

F-3:KL **Defect Engineering in 2-Dimensional Materials: From Theory to Applications**
M. TERRONES, Department of Physics, Department of Chemistry, Department of Materials Science and Engineering and Center for 2-Dimensional & Layered Materials, The Pennsylvania State University, University Park, PA, USA & Institute of Carbon Science and Technology, Shinshu University, Japan

F-3:IL02 **Black-phosphorus, Graphene and 2D Binary Transition Metal Dichalcogenides for Device Applications**
A. KAUL, University of Texas, El Paso, TX, USA

F-3:IL03 **Taming Functional Complexity in Graphene based Materials Mastering the Supramolecular Approach**
P. SAMORI', ISIS, Université de Strasbourg & CNRS, Strasbourg, France

F-3:IL04 **2D Magnetic Materials based on Coordination Chemistry**
S. MAÑAS-VALERO, M. CLEMENTE-LEÓN, **E. CORONADO**, ICMol, University of Valencia, Spain

F-3:L05 **Epitaxial Growth of Large Area MoS2 Few Layers by Sputtering Process**
TAEKYUNG OH, HYUNGSEOB MIN, HYUNSU JU, **JEON-KOOK LEE**, Center of Opto-Electronic Materials and Devices, Korea Institute of Science and Techniology, Seoul, Korea

F-3:L06 **Rapid and Catalyst-free van der Waals Epitaxy of Graphene on Hexagonal Boron Nitride**
N. MISHRA[1], V. MISEIKIS[1], D. CONVERTINO[1], M. GEMMI[1], V. PIAZZA[1], **C. COLETTI**[1,2], [1]Center for Nanotechnology Innovation @ NEST, Istituto Italiano di Tecnologia, Pisa, Italy; [2]Graphene Labs, Istituto Italiano di Tecnologia, Genova, Italy

F-3:IL07 **Direct Fabrication of Functionalized Graphenes and their Hybrids Inks via Submerged Liquid Plasma [SLP] and Electrochemical Exfoliation [ECE] under Ambient Conditions**
M. YOSHIMURA, J. SENTHILNATHAN, K. SANJEEVARAO, Promotion Centre for Global Materials Research (PCGMR), Dept. of Material Science and Engineering, National Cheng Kung University, Tainan, Taiwan

F-3:IL08 **Phase Engineering of Transition Metal Dichalcogenides for Optoelectronic Applications**
A.D. MOHITE, Los Alamos National Laboratory, Los Alamos, NM, USA

F-3:L09 **How the Nanostructure of Layered Titanates Influences the Mechanical Properties**
P. GONZALEZ[2], W. LETTE[3], D.J. SCHIPPER[3], J.E. TEN ELSHOF[2], [1]Materials innovation institute (M2i), Delft, the Netherlands; [2]Inorganic Materials Science Group, MESA+ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands; [3]Faculty of Engineering Technology, University of Twente, Enschede, The Netherlands

F-3:L11 **Lessons learned from Carbon Nanotube Growth can be applied to Graphene: 100% Reproducibility and Improved Graphene Quality by Preheating Precursor Gases using Thermal Chemical Vapor Deposition**
G.D. NESSIM, Bar Ilan University, Department of Chemistry and Center for Nanotechnology and Advanced Materials, Ramat Gan, Israel

F-3:L12 **One-pot Electrochemical Exfoliation and Functionalization of Graphene Sheets**
D.B. OSSONON, **D. BELANGER**, Université du Québec à Montréal, Département de Chimie, Montréal, Canada

F-3:L13 **Synthesis of Graphene Membranes: Effect of Substrate Surface Properties on Monolayer Graphene Transfer**
F.M. KAFIAH, **Z. KHAN**, A. IBRAHIM, T. LAOUI, Department of Mechanical Engineering, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia; M. ATIEH, Qatar Environment and Energy Research Institute, HBKU, Qatar Foundation, Doha, Qatar

F-3:L14 **Selective Modification of as-grown CVD Graphene on Cu by Oxygen Plasma for Flexible Electronics Applications**
A.M. ALEXEEV, M.D. BARNES, V.K. NAGAREDDY, M.F. CRACIUN, C.D. WRIGHT, College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, UK

F-3:L15 **Langmuir-Blodgett Films of 2D Oxide Nanosheets for Oriented and Epitaxial Growth of Functional Oxide Thin Films**
J.E. TEN ELSHOF, **HUIYU YUAN**, M. NIJLAND, M. NGUYEN, G. RIJNDERS, G. KOSTER, MESA+ Institute for Nanotechnology, University of Twente, Enschede, the Netherlands

Session F-4
Synthesis and Processing of Composites

F-4:IL01 **Graphene and New Monoatomic Materials: Using 2-dimensional Nanosheets in a 3-dimensional World**
V. PALERMO, National Research Council of Italy, CNR-ISOF, Bologna, Italy

F-4:IL02 **Fabrication Processes and Properties of Multi-functional Graphene and Carbon Nanotube Nanocompositess**
SOON HYUNG HONG, Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

F-4:IL03 **MXenes and MXene-based Composites for Energy Storage**
M.R. LUKATSKAYA[1,2], MENGQIANG ZHAO, CHANG E. REN[1,2], M. GHIDIU, O. MASHTALIR[1,2], Y. DALL'AGNESE[1,2,3,4], P. SIMON[3,4], M.W. BARSOUM[1], **Y. GOGOTSI**[1,2], [1]Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA; [2]A.J. Drexel Nanotechnology Institute, Drexel University, Philadelphia, PA, USA; [3]Université Paul Sabatier, CIRIMAT UMR CNRS 5085, Toulouse, France; [4]Réseau sur le Stockage Electrochimique de l'Energie (RS2E), FR CNRS 3459, France

F-4:IL04 **A Polymer Chemistry of Graphenes: Synthesis, Processing, Applications**
K. MUELLEN, Max Planck Institute for Polymer Research, Mainz, Germany

F-4:IL05 **Graphene Oxide Composite 3D Materials obtained by Self-assembly Process using Biological Macromolecules**
R. IPPOLITI, M. ARDINI, L. OTTAVIANO, S. SANTUCCI, F. PERROZZI, G. FIORAVANTI, G. PANELLA, A.CIMINI, E. BENEDETTI, F. ANGELUCCI, University of L'Aquila, Italy; G. FABRIZI, University of Rome La Sapienza, Rome, Italy; V. MORANDI, L. ORTOLANI, M. CHRISTIAN, V. PALERMO, CNR, Bologna, Italy; L. PALOMBI, University of Salerno, Salerno, Italy

F-4:L06 **Grain and Grain Boundaries Effects on Electrical Transport Properties of Cobalt Ferrite/Graphene Nanocomposites**
S. SUPRIYA, S. KUMAR, **M. KAR**, Indian Institute of Technology Patna, Bihta, Patna, Bihar, India

F-4:L07 **Synthesis of Graphene Sheets and Composite Nanoparticles based on them in Oil-in-aqua Emulsion**
E.A. TRUSOVA[1], K.V. KOTSAREVA[1], A.N. KIRICHENKO[2], I.A. PEREZHOGIN[2], [1]Baikov Institute of Metallurgy and Materials Science, RAS, Moscow, Russia; [2]Technological Institute for Superhard and Novel Carbon Materials, Troitsk, Moscow, Russia

F-4:L08 **Facile Synthesis of MoO3-graphene Composites for Supercapacitor Applications**
MUI YEN HO, P.S. KHIEW, W.S. CHIU, Department of Materials Engineering, Faculty of Engineering and Built Environment, Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia; Faculty of Engineering, University of Nottingham Malaysia Campus, Semenyih, Selangor, Malaysia; Low Dimensional Materials Research Center, Department of Physics, Faculty of Science, University Malaya, Kuala Lumpur, Malaysia

Session F-5
Novel Characterizations

F-5:KL **Electronic and Optoelectronic Physics in the van der Waals Heterojunctions**
PHILIP KIM, Department of Physics, Harvard University, Cambridge, MA, USA

F-5:IL01 **Photoconductivity in 2D Layers of Transition Metal Dichalcogenides**
S. TALAPATRA, Department of Physics, Southern Illinois University, Carbondale, IL, USA

F-5:L02 **Quantitative Evaluation of Graphene and Graphene Oxide Thickness with Sub-monolayer Accuracy by Scanning Auger Micro-spectroscopy**
M.J. VAHID DASTJERDI[1], **S.M. PIETRALUNGA**[2,3], G.M. VANACORE[1], L. POLLONI[4], L.G. RIZZI[4], R. SORDAN[4], V. RUSSO[5], M. ZANI[1], A. TAGLIAFERRI[1,3], [1]Politecnico di Milano, Dip. Fisica, Milan, Italy; [2]CNR, Istituto di Fotonica e nanotecnologie, Milan, Italy; [3]Center for Nano Science and Technology @Polimi, Istituto Italiano di Tecnologia, Milan, Italy; [4]L-NESS, Department of Physics, Politecnico di Milano, Como, Italy; [5]Politecnico di Milano, Dip. Energia, Milan, Italy

F-5:L03 **Behaviour of Elastic Modulus of Nano Filled Polymer Composite under Dynamic Mechanical and Nano-hardness Analysis**
V.K. SRIVASTAVA, Department of Mechanical Engineering, Indian Institute of Technology (BHU), Varanasi, India

Session F-6
Application of Graphene and other 2D Layered Materials and Composites

F-6:KL **Origin and Impact of Noise in Multifunctional 2D Electronics**
A. GHOSH, Department of Physics, Indian Institute of Science, Bangalore, India

F-6:IL01 **Strong Light-matter Interactions at Graphene-heterostructures for Photonics and Photovoltaics**
CHUN-WEI CHEN[1], CHIA-CHUN CHEN[2], PO-HSUN HO[1], [1]Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan; [2]Department of Chemistry, National Taiwan Normal University, Taipei, Taiwan

F-6:IL02 **Photo Sensor Devices Based on Few-layered WS2 and WSe2 Films and Heterostructures**
N. PEREA LOPEZ[1], ZHONG LIN[1], A.L. ELÍAS[1], V. CAROZO[1], S. FENG[1], S. TALAPATRA[2], H. TERRONES[3], M. TERRONES[1,4], [1]Department of Physics and Center for 2-Dimensional and Layered Materials, The Pennsylvania State University, University Park, PA, USA; [2]Department of Physics, Southern Illinois University Carbondale, IL, USA; [3]Department of Physics, Applied Physics and Astronomy, Rensselaer Polytechnic Institute, USA; [4]Department of Materials Science and Engineering and Materials Research Institute, The Pennsylvania State University, University Park, PA, USA

F-6:IL03 **A New Paradigm for Selective NO2 Gas Sensing with Physisorption based Two Dimensional SnS2**
K. KALANTAR-ZADEH[1], J.Z. OU[1], W. GE[2], W. SHAN[2], S.P. RUSSO[3], Y. X. LI[1,2], [1]School of Electrical and Computer Engineering, RMIT University, Melbourne, Australia; [2]The Key Laboratory of Inorganic Functional Materials and Devices, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, P.R. China; [3]School of Applied Sciences, RMIT University, Melbourne, Australia

F-6:IL04 **Graphene, 2D Crystals and Hybrid Heterostructures: The Road to Applications**
F. BONACCORSO, Istituto Italiano di Tecnologia, Graphene Labs, Genova, Italy

F-7:IL05 **Highly Efficient Photocatalytic CO2 Conversion to Selective Hydrocarbons using Graphene Oxides and Related 2D Hybrids**
LI-CHYONG CHEN, Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; KUEI-HSIEN CHEN, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan

F-6:IL06 **The Route to the Silicene Field Effect Transistor**
A. MOLLE[1], E. CINQUANTA[1], C. GRAZIANETTI[1], L. TAO[2], D. AKINWANDE[2], [1]CNR-IMM, Laboratorio MDM, Agrate Brianza (MB), Italy; [2]The University of Texas at Austin, TX, USA

F-6:L07 **Light Detection from Nanocrystal Sensitized Graphene Photodetectors at kHz Frequencies**
D. SPIRITO, S. KUDERA, R. KRAHNE, Istituto Italiano di Tecnologia, Nanochemistry department and Graphene Labs, Genoa, Italy; V. MISEIKIS, C. COLETTI, Istituto Italiano di Tecnologia, Center for Nanotechnology Innovation and Graphene Labs, Pisa, Italy; C. GIANSANTE, Center for Biomolecular Nanotechnologies @UNILE, Istituto Italiano di Tecnologia and CNR NANOTEC-Istituto di Nanotecnologia, Lecce, Italy

F-6:L08 **2D Inorganic Materials as Control Layer in Highly Ordered Organic Photovoltaic Materials**
L.C. LENTZ, A.M. KOLPAK, MIT, Cambridge, MA, USA

F-6:L09 **Epitaxial Graphene on SiC as a Platform for Extremely Sensitive and Selective Gas Sensors**
J. ERIKSSON, C. STRANDQVIST, R. GUNNARSON, S. EKEROTH, U. HELMERSON, I.G. IVANOV, R. YAKIMOVA, A. LLOYD SPETZ, Linköping University, Linköping, Sweden; C. STRANDQVIST, Graphensic AB, Linköping, Sweden

F-6:L11 **Alkali Metal Insertion in TiO2- and Li4Ti5O12-graphene Composites for Battery Applications**
M. ZUKALOVA, A. ZUKAL, B. PITNA LASKOVA, L. KAVAN, J. Heyrovský Institute of Physical Chemistry, v.v.i., AS CR, Prague, Czech Republic

F-6:L12 **Failure of Self Lubricating Properties of MoS2: Oxidation or Water Molecules Adsorption?**
E. SERPINI[1,2], A. ROTA[2], D. MARCHETTO[1,2], S. VALERI[1,2,3], [1]Dipartimento di Scienze Fisiche, Informatiche e Matematiche - Università di Modena e Reggio Emilia, Modena, Italy; [2]Istituto CNR-NANO S3, Modena, Italy; [3]Centro Interdipartimentale per la Ricerca Applicata e i Servizi nella Meccanica Avanzata e nella Motoristica Intermech-Mo.Re., Università di Modena e Reggio Emilia, Modena, Italy

F-6:L13 **Graphene Networks as Electrically-heatable Support for Layered Double Hydroxides for Applications in Heterogeneous Catalysis and Adsorption**
R. MENZEL[1,2], A. GARCIA-GALLASTEGUI[2], M.S.P. SHAFFER[2], S. BARG[3], E. SAIZ[3], S.M. BAWAKED[4], M. MOKHTAR[4], SHAEEL A. AL-THABAITI[4], S.N. BASAHEL[4], [1]University of Leeds, Dept of Chemistry, Leeds, UK; [2]Dept. of Chemistry, Imperial College London, London, UK; [3]Dept. of Materials, Imperial College London, London, UK; [4]Dept. of Chemistry, King Abdulaziz University, Jeddah, Saudi Arabia

F-6:L14 **Graphene Lubrication of Steel-steel Contacts**
D. MARCHETTO[1], P. RESTUCCIA[1], C. RIGHI[2], S. VALERI[1,2,3], [1]Dipartimento di Scienze Fisiche, Informatiche e Matematiche, Università di Modena e Reggio Emilia, Modena, Italy; [2]Istituto CNR-NANO S3, Modena, Italy; [3]Centro Interdipartimentale per la Ricerca Applicata e i Servizi nella Meccanica Avanzata e nella Motoristica Intermech-Mo.Re., Università di Modena e Reggio Emilia, Modena, Italy

F-6:L15 **Wearable Electronics using Graphene Hybrid Nanostructures**
JANG-UNG PARK, School of Materials Science and Engineering, UNIST, Ulsan, Korea

F-6:L16 **Nitrogen-doped Graphene/Silver Hybrid Films to develop a Highly Sensitive Electrochemical Non-enzymatic Biosensor**
M.T. TAJABADI, M. SOOKHAKIAN, W. J. BASIRUN, Department of Chemistry, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia

Poster Presentations

F:P01 **Raman Spectroscopy and Surface Morphology in Thin Layers of Chalcogenides of Bismuth and Antimony**
L.N. LUKYANOVA[1], O.A. USOV[1], A.YU. BIBIK[2], V.A. ASEEV[2], V.N. PETROV[1], I.V. MAKARENKO[1], N.V. NIKONOROV[2], [1]Ioffe Institute, Saint-Petersburg, Russian Federation; [2]Saint-Petersburg State University of Informational Technologies, Mechanics and Optics, Saint-Petersburg, Russian Federation

F:P02 **Electromagnetic Properties in Multilayer Graphene within the Ritus Formalism: Transverse Electrical Conductivity**
G. MURGUIA-ROMERO, A. SÁNCHEZ, R. ZAVALETA-MADRID, Facultad de Ciencias, Universidad Nacional Autónoma de México, Distrito Federal, México

F:P03 **Nanolayer Graphene Synthesis by Carbon Ion Implantation**
JANGHYUK KIM, GEONYEOP LEE, **JIHYUN KIM**, Department of Chemical and Biological Engineering, Korea University, Seoul, South Korea

F:P04 **Electrochemical Reduction of Graphene Oxide: Synthesis and Applications**
A.B. LOPEZ-OYAMA[1,2], M.A. DOMÍNGUEZ-CRESPO[1], R. GÁMEZ-CORRALES[3], E. ONOFRE-BUSTAMANTE[1], A.M. TORRES-HUERTA[1]; [1]Instituto Politécnico Nacional, Programa de Doctorado en Tecnología Avanzada, CICATA-Altamira, Grupo CIAMS, Altamira, Tamps, México; [2]Cátedra Conacyt, Del. Benito Juárez; [3]Universidad de Sonora, Hermosillo, Sonora, México

F:P05 **Maximyzing the Potential of Layered Compounds for Hydrogen Production**
O.E. MEIRON[1], L. HOUBEN[2], M. BAR-SADAN[1], [1]Ben Gurion University of the Negev, the chemistry department, Beer Sheba, Israel; [2]Chemical Research Support, Weizmann Institute of Science, Rehovot, Israel

F:P06 **Opportunities for sp2-hybridized Carbon Nitride**
P.O.Å. PERSSON, J. PALISAITIS, **A. KAKANAKOVA-GEORGIEVA**, Department of Physics, Chemistry and Biology (IFM), Linköping University, Sweden

F:P08 **Electrical Conductivity of Graphene – Ni nanoparticle Composite in Accordance with the Content of Organic Matters**
YOU-BI KIM, Y.W. HONG, T.H. SHIN, J.H. PAIK, KICET, Jinju-si, Gyeongsangnam-do, South Korea

F:P09 **Visualizing Chemical States and Defects induced Magnetism of Graphene Oxide by Spatially-resolved-X-ray Microscopy and Spectroscopy**
Y.F. WANG, S.B. SINGH, M.V. LIMAYE, Y.C. SHAO, S.H. HSIEH, L.Y. CHEN, H.C. HSUEH, **WAY-FAUNG PONG**, Department of Physics, Tamkang University, Tamsui, Taiwan

F:P10 **Interfacial Engineering for Enhancement of Electrical Characteristics in MoS2 Field-effect Transistors**
DONGRI QIU, **EUN KYU KIM**, Quantum-Function Research Laboratory and Department of Physics, Hanyang University, Seoul, Korea

F:P11 **Anticorrosion Properties of Electrochemical Reduced Graphene Oxide Coatings on 304 L Stainless Steel**
A.B. LÓPEZ-OYAMA[1,2], **M.A. DOMÍNGUEZ-CRESPO**[1], E. ONOFRE-BUSTAMANTE[1], A.M. TORRES-HUERTA[1], A.R. HERNÁNDEZ-BASILIO[3], [1]Instituto Politécnico Nacional, Programa de Doctorado en Tecnología Avanzada, CICATA-Altamira, Grupo CIAMS, Altamira, Tamps. México; [2]Cátedra Conacyt, Del. Benito Juárez; [3]Instituto Politécnico Nacional, Alumna de maestría en Tecnología Avanzada CICATA Altamira, Grupo CIAMS, Altamira, Tamps, México

F:P12 **Nanoperforated Graphenes for Energy Storage Applications**
HYUN KYUNG KIM, SEOK WOO LEE, YEON JUN CHOI, **KWANG BUM KIM**, Department of Material Science and Engineering, Yonsei University, Seoul, Republic of Korea

F:P13 **Aerogels Based on Microwave Plasma Torch Synthesized Graphene**
F.R. SULTANOV, Z.A. MANSUROV, Institute of Combustion Problems, Almaty, Kazakhstan; S.C. CHANG, S. XING, F. ROBLES-HERNANDEZ, S.S. PEI, Center for Advanced Materials University of Houston, Houston, TX, USA; Y.W. CHI, K.P. HUANG, Mechanical and Systems Research Laboratories, Industrial Technology Research Institute Chutung, Hsinchu, Taiwan, R.O.C.

SYMPOSIUM G

MULTIFUNCTIONAL INORGANIC ONE-DIMENSIONAL NANOSTRUCTURES: STATUS AND POTENTIAL

Oral Presentations

Session G-1
Growth and Functionalization of 1-D Nanostructure

G-1:IL01 **Controlled Growth and Optoelectronic Properties of Wide Bandgap Semiconducting Nanowires**
S. GRADECAK, Department of Materials Science and Engineering, MIT, Cambridge, MA, USA

G-1:IL02 **Growth and Structure of Self-catalyzed III-V Nanowires on Silicon**
V.G. DUBROVSKII, St. Petersburg Academic University, St. Petersburg, Russia Ioffe Physical Technical Institute RAS, St. Petersburg, Russia

G-1:IL03 **GaN/InGaN Nanowire Structures - MBE Growth and Optical Properties**
H. RIECHERT, Paul-Drude-Institut, Berlin, Germany

G-1:IL04 **Demonstration of Hole Gas Accumulation Control in Ge/Si Core-shell Nanowires**
NAOKI FUKATA[1], K. NISHIBE[1], M. YU[1], W. JEVASUWAN[1], T. TAKEI[1], Y. BANDO[1], W. WU[2], Z.L. WANG[2], [1]National Institute for Materials Science (NIMS), Tsukuba, Japan; [2]School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA, USA

G-1:IL05 **Heterostructure Formation in Nanowires of Alloyed Compound Semiconductors - Experiments and Theory**
F. GLAS, G. PRIANTE, F. OEHLER, K. PANTZAS, G. PATRIARCHE, J.-C. HARMAND, Laboratoire de Photonique et de Nanostructures, CNRS, Université Paris Saclay, Marcoussis, France

G-1:IL06 **Hybrid Nanophotonics-nanomaterial Platforms with III/V Semiconductor Nanowires on Si**
MASAYA NOTOMI, NTT Basic Research Laboratories and NTT Nanophotonics Center, Atsugi, Japan

G-1:IL07 **MBE Growth of Self Assisted InAs Nanowires on Graphene**
JUNG-HYUN KANG, Y. COHEN, Y. RONEN, M. HEIBLUM, D. CONVERTINO, A. ROSSI, C. COLETTI, S. HEUN, **L. SORBA**, H. SHTRIKMAN, Braun Center for Submicron Research, Weizmann Institute of Science, Rehovot, Israel; Istituto Nanoscienze-CNR and Scuola Normale Superiore, Italy

G-1:IL08 **Real-time Investigation of III-V Nanowire Growth using In-situ TEM**
K. DICK THELANDER, Solid State Physics, Lund University, Lund, Sweden Center for Analysis and Synthesis, Lund University, Lund, Sweden

G-1:L09 **Au-catalyst Assisted Self-assembly of CdTe Nanowires by Metalorganic Vapour Phase Epitaxy**
V. DI CARLO, F. MARZO, N. LOVERGINE, Dept. of Engineering for Innovation, University of Salento, Lecce, Italy; P. PRETE, IMM-CMR, Lecce, Italy

G-1:L10 **Fabrication of Nanocomposite Nanofibers: Reactions Mechanisms and Properties**
M. AGHAYAN[1], I. HUSSAINOVA[1,2], [1]Tallinn University of Technology, Department of Materials Engineering, Tallinn, Estonia; [2]ITMO University, St. Petersburg, Russian Federation

G-1:IL11 **Guided Growth of Horizontal Nanowires: A General Approach to Structural Control and Large-scale Integration**
E. JOSELEVICH, Department of Materials and Interfaces, Weizmann Institute of Science, Rehovot, Israel

G-1:IL12 **Quantum Dots in Group IV Nanowires**
A. LUGSTEIN[1], M. GLASER[1], SEBASTIAN GLASSNER[1], S. PRUCNAL[2], ANDREAS JOHANNES[3], SÒNIA CONESA-BOJ[4], CARSTEN RONNING[3], A. FONTCUBERTA I MORRAL[4], W. SKORUPA[2], E. BERTAGNOLLI[1], [1]Institute for Solid State Electronics, Vienna University of Technology, Austria; [2]Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; [3]Institute for Solid State Physics, Friedrich-Schiller-University Jena, Germany; [4]Lab. des Matériaux Semiconducteurs, EPFL, Lausanne, Switzerland

G-1:IL13 **III-V Nanowires, Growth Challenges and Applications in Next Generation Photovoltaics**
E. ALARCON-LLADO, **A. FONTCUBERTA I MORRAL**, G. TUTUNCUOGLU, EPFL, Lausanne, Switzerland

G-1:L14 **Single Wall and Multiwall Nanotubes of WS2: Their Synthesis, Properties and Applications**
A. ZAK, O. GRINBERG, Holon Institute of Technology, Holon, Israel; R. POPOVICH-BIRO, R. TENNE, Weizmann Institute of Science, Rehovot, Israel; V. BRUESER, Leibnitz Institute of Plasma, Greifswald, Germany; E. ZUSSMAN, Technion-Israel Institute of Technology, Haifa, Israel; T. LIVNEH, Nuclear Research Center, Beer-Sheva, Israel

G-1:L15 **Selective-area MOVPE Growth of GaAs Nanowires on Silicon using a Non-lithographic Approach to SiO2 Mask Patterning**
E. STEVANATO, Dept. of Engineering for Innovation, University of Salento & Italian Institute of Technology, Lecce, Italy; A. PEDIO, F. MARZO, N. LOVERGINE, Dept. of Engineering for Innovation, University of Salento, Lecce, Italy; P. PRETE, IMM-CMR, Lecce, Italy

Session G-2
Structure and Properties of 1-D Nanostructures

G-2:IL01 **Analysis of 1D-nanostructure Properties using in Situ Transmission Electron Microscopy**
D. GOLBERG, WPI-MANA, National Institute for Materials Science (NIMS), Tsukuba, Ibaraki, Japan

G-2:IL02 **Thermoelectric Properties of Single Nanowires**
I. ZARDO, Department of Physics, University of Basel, Basel, Switzerland

G-2:IL03 **X-ray Investigations of Single Nanowire Devices**
J. WALLENTIN, Synchrotron Radiation Research, Lund University, Sweden

G-2:IL04 **From 1D Silicene Nanoribbons to 2D Sheets**
P. DE PADOVA, Consiglio Nazionale delle Ricerche, Istituto di Struttura della Materia, Roma, Italy

G-2:IL05 **Dislocation-driven Nanowire Growth and Lead Halide Perovskite Nanowire Lasers with Low Lasing Thresholds and High Quality Factors**
SONG JIN, Department of Chemistry, University of Wisconsin-Madison, Madison, WI, USA

G-2:IL06 **Contact-free Surface Acoustic Wave Control of Nanowire Heterostructures**
H.J. KRENNER[1], M. WEISS[1], J.B. KINZEL[1], F.J.R. SCHÜLEIN[1], M. HEIGL[1], D. BÜHLER[1], A. WIXFORTH[1], D. RUDOLPH[2], M. BICHLER[2], G. ABSTREITER[2,3], J.J. FINLEY[2], G. KOBLMÜLLER[2], [1]Lehrstuhl für Experimentalphysik 1, Universität Augsburg, Augsburg, Germany; [2]Walter Schottky Insitut, TU München, Garching, Germany; [3]Institute for Advanced Study, TU München, Garching, Germany

G-2:IL07 **GaAs-AlGaAs Core-(Multi)Shell Nanowire Structures: MOVPE Growth and Nano-scale Optical/Electronic Properties**
P. PRETE, IMM-CNR, Lecce, Italy; R. ROSATO, E. STEVANATO, F. MARZO, N. LOVERGINE, Dept. of Engineering for Innovation, University of Salento, Lecce, Italy

G-2:IL08 **Probing and Exploiting Ultrafast Charge Carrier Dynamics in Semiconductor Nanowires**
H.J. JOYCE, S. BAIG, G. TAINTER, Department of Engineering, University of Cambridge, UK; G. TÜTÜNCÜOGLU, F. MATTEINI, A. CASADEI, F. AMADUZZI, F. JABEEN, A. FONTCUBERTA I MORRAL, Laboratory of Semiconductor Materials, EPFL, Switzerland; J.L. BOLAND, P. PARKINSON, C.L. DAVIES, S. CONESA-BOJ, L.M. HERZ, M.B. JOHNSTON, Department of Physics, University of Oxford, UK; K. PENG, N. JIANG, L. FU, H.H. TAN, C. JAGADISH, Department of Electronic Materials Engineering, Research School of Physics and Engineering, The Australian National University, Australia

G-2:IL09 **Structure-property Correlations in 1D-nanowires using Atom Probe Tomography**
L.J. LAUHON, Dept. of Materials Science and Engineering, Northwestern University, Evanston, IL, USA

G-2:IL10 **Quantum Gases in ZnO Nanowires**
R. SCHMIDT-GRUND, Universität Leipzig, Institut für Experimentelle Physik II, Leipzig, Germany

G-2:IL11 **Structural and Quantum Transport Properties of Functionalized Boron Nitride Nanotubes**
YOKE KHIN YAP, Department of Physics, Michigan Technological University, Houghton, MI, USA

G-2:L12 **Developing Multi-functional Nanocontacts to Nanowires**
A. LORD, J.E. EVANS, Centre for NanoHealth, Swansea University, UK; S.P. WILKS, College of Science, Swansea University, UK

G-2:L13 **Unraveling Size Effect of Metallic Nanowires towards Ultra-strong Metal Nanostructured Material**
IN-SUK CHOI, High Temperature Energy Materials Research Center, Korea Institute of Science and Technology, Seoul, Rep.of Korea

G-2:L14 **Synthesis and Characterization of Ni/TiO2 Nanocomposite Coatings as Potential Electrocatalysts for the Hydrogen Evolution Reaction (HER)**
E. DANAILA, L. BENEA, Competences Center: Interfaces-Tribocorrosion-Electrochemical Systems (CC-ITES), Faculty of Engineering, Dunarea de Jos University of Galati, Galati Romania

Session G-3
Modeling and Simulation of 1-D Nanostructures

G-3:IL01 **Electronic Transport in 1D Nanostructures**
J. LI, Y.M. NIQUET, Univ. Grenoble Alpes & CEA Grenoble, France; **C. DELERUE**, IEMN, Lille, France

G-3:IL02 **Theoretical Study of Ordered III-V Nanowire Arrays for Light Emission and Detection**
B. WITZIGMANN, University of Kassel, Kassel, Germany

G-3:L03 **Ab Initio Electronic Transport in Atomic Carbon Chains**
J.-C. CHARLIER, University of Louvain, Institute of Condensed Matter and Nanosciences, Louvain-la-Neuve, Belgium

G-3:L04 **Influence of the Arsenic Flux on the Formation of Axial Heterostucture in (Al,Ga,In)As Nanowires**
N. SIBIREV, A. KORYAKIN, V. DUBROVSKII, Saint-Petersburg Academic University, ITMO University, Saint-Petersburg, Russian Federation

Session G-4
Processing, Characterization and Modeling of 1-D Nanostructure-polymer/metal/ceramics Composites

G-4:IL01 **Selective Lateral 1D Epitaxy: III-V Planar Nanowire Growth, Doping, and Transistors**
XIULING LI, Department of Electrical and Computer Engineering, Micro and Nanotechnology Laboratory, University of Illinois, Urbana, IL, USA

G-4:IL02 **Observation of Metal to Insulator Transitions and Ferroelectric Domain Switching in Phase Change Materials Prior to Amorphization**
R. AGARWAL, Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA, USA

G-4:L03 **Electrospinning and Thermal Processing of PZT Nanofiber Mats with Controlled Shape**
G.S. GRADER, O. ROZENT, V. BEILIN, **G.E. SHTER**, Technion-Israel Institute of Technology, Haifa, Israel

G-4:L04 **Biodegradable Inorganic Nano-architectures to avoid Accumulation in Excretory System Organs**
D. CASSANO[1,2], D. ROTA MARTIR[1], G. SIGNORE[1], V. PIAZZA[1], **V. VOLIANI**[1], [1]Center for Nanotechnology Innovation @NEST, Istituto Italiano di Tecnologia, Pisa, Italy; [2]NEST-Scuola Normale Superiore, Pisa, Italy

G-4:L05 **Boron Nitride Nanotube: Synthesis, Functionalization, and Nanocomposites**
C.M. HOMENICK, Y. MARTINEZ-RUBI, K.S. KIM, M.B. JAKUBINEK, C.T. KINGSTON, B. SIMARD, Security and Disruptive Technologies Portfolio, National Research Council Canada, Ottawa, Canada; B. ASHRAFI, Aerospace Portfolio, National Research Council Canada, Montreal, Canada

G-4:L06 **Fabrication of Y2Ti2O7/SiC Functionally Graded Materials by Magnetic Field Application**
S.T. NGUYEN, T. NAKAYAMA, H. SUEMATSU, T. SUZUKI, S. TANAKA, Y. NAGASAWA, K. NIIHARA, Nagaoka University of Technology, Nagaoka, Niigata, Japan

Session G-5
1-D Nanostructures-based Applications

G-5:IL01 **Zinc Oxide Nanorods Field-effect Transistors Array Biosensor for Comprehensive Detecting Glucose, Cholesterol and Urea**
YOON-BONG HAHN, R. AHMAD, DA-UN-JIN JUNG, School of Semiconductor and Chemical Engineering, and Nanomaterials Processing Research Center, Chonbuk National University, Jeonju, Republic of Korea

G-5:L02 **Gallium Arsenide Nanowire Lasers**
C. JAGADISH, Department of Electronic Materials Engineering, Research School of Physics and Engineering, Australian National University, Canberra, A.C.T., Australia

G-5:IL03 **Artificial Photosynthesis on Metal-nitride Nanowire Arrays**
ZETIAN MI, B. ALOTAIBI, S. FAN, Y. WANG, S. VANKA, Department of Electrical and Computer Engineering, McGill University, Montreal, Quebec, Canada

G-5:IL04 **Ultrafast Dynamics in Plasmonic and Photonic Nanowire Lasers**
R.F. OULTON, T.P.H. SIDIROPOULOS, S.A. MAIER, O. HESS, Imperial College London, London, UK; R. RÖDER, S. GEBURT, C. RONNING, FSU Jena, Jena, Germany

G-5:IL05 **Nanowire Field-effect Transistor-based Biosensors: A Tool for Life Science**
YIT-SONG CHEN, Department of Chemistry, National Taiwan University, Taipei, Taiwan and Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan

Poster Presentation

G:P01 **Effect of Buffer Layer on Electrical and Optical Properties based on SnO2/Ag/SnO2 Multi Layer Film**
JIN-GYUN KIM, **GUN-EIK JANG**, Department of Materials Engineering, Chungbuk National University, Cheongju, Korea

G:P02 **Highly Flexible and Transparent Conductive Electrode based on Silver Nanowires**
CHANG SU KIM, MYUNGKWAN SONG, DONG-HO KIM, Advanced Functional Thin Films Department, Korea Institute of Materials Science (KIMS), Changwon, Korea

G:P03 **Au-Ag Core Shell Nanowire Network for Highly Stretchable and Transparent Supercapacitor Applications**
HABEOM LEE[1], SUKJOON HONG[2], JIN HWAN LEE[1], YOUNG DUK SUH[1], JINHYEONG KWON[1], JUNYEOB YEO[2], HYUNMIN CHO[1], SEUNG HWAN KO[1], [1]Seoul National Univ, Seoul, Korea; [2]Mechanical Engineering, University of California, Berkeley, Berkeley, CA, USA

SYMPOSIUM H
ELECTROACTIVE POLYMERS AND SHAPE MEMORY POLYMERS: ADVANCES IN MATERIALS AND DEVICES

Oral Presentations

Session H-1
Advances in EAP Materials

H-1:IL01 **The Evolution of Strong, Fast, Powerful, Durable, and Cheap Polymer Artificial Muscles from Carbon Nanotube Muscles**
R.H. BAUGHMAN, A.G. MACDIARMID, NanoTech Institute, the University of Texas at Dallas, Dallas, TX, USA

H-1:IL02 **Electromechanical Properties of CNT-ionic Gel Actuators**
KINJI ASAKA, T. SUGINO, K. KIYOHARA, National Institute of Advanced Industrial Sciece and Technology (AIST), Ikeda, Osaka, Japan

H-1:IL03 **Improved Dielectric Elastomer and Bistable Electroactive Polymer Materials and Devices**
QIBING PEI, Department of Materials Science and Engineering University of California, Los Angeles, CA, USA

H-1:L04 **Stronger VHB Dielectric Elastomer Actuator**
GIH-KEONG LAU, THANH-GIANG LA, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

H-1:L05 **Piezoelectric Polymer Foams: Structure and Property Adjustment for Air-borne Ultrasonic Transducer**
M. SBORIKAS[1], J. EALO[2], **M. WEGENER**[1], [1]Department of Sensors and Actuators, Fraunhofer IAP, Potsdam, Germany; [2]School of Mechanical Engineering, University of Valle, Ciudad Universitaria Meléndez, Cali, Colombia

H-1:L06 **Polymeric Electrochemical Motors Sense Physical and Chemical Working Conditions: Artificial Proprioception**
T.F. OTERO[1], **Y.A. ISMAIL**[2], L. VALERO[1,3], J.G. MARTINEZ[1], [1]Laboratory for Electrochemistry, Intelligent Materials and Devices, Univ. Politécnica de Cartagena, Cartagena, Spain; [2]Dept.of Basic Sciences, College of Applied Science, A'Sharqiyah University, Ibra, Oman; [3]Electronic Engineering School, Universidad Autónoma del Estado de México, Toluca, México

H-1:IL07 **Green EAP Materials and Physics of the Electromechanical Responses in Ionic EAPs**
ZHONGYANG CHENG, P. BASS, Materials Research and Education Center, Auburn University, Auburn, AL, USA

H-1:L08 **Impact of Structural Modifications on Electrically Induced Properties of Relaxor Polymer Systems**
V. BOBNAR, G. CASAR, S. GLINSEK, J. KORUZA, B. MALIC, J. Stefan Institute, Ljubljana, Slovenia; X. LI, Q.M. ZHANG, Department of Electrical Engineering and Materials Research Institute, The Pennsylvania State University, University Park, PA, USA

H-1:L09 **High Dielectric Permittivity Elastomers for Artificial Muscles**
D.M. OPRIS, S. DÜNKI, E. PERJU, F. NÜESCH, Swiss Federal Laboratories for Materials Science and Technology Empa, Duebendorf, Switzerland

H-1:L10 **Piezoelectric and Dielectric behaviour of Odd Nylon Blends**
D.S. KELKAR, Institute of Science, Nagpur, India; S.A. PANDE, Laxminarayan Institute of Technology, Nagpur, India

Session H-2
Analysis and Mechanical Mechanisms

H-2:IL01 **Biological Ferroelectricity – Phenomena, Mechanism, and Implications**
JIANGYU LI, University of Washington, Seattle, WA, USA

H-2:IL02 **Asymmetric Bilayer Artificial Muscles Based on Polypyrrole**
MASAKI FUCHIWAKI, Kyushu Institute of Technology, Iizuka, Fukuoka, Japan; J.G. MARTINEZ, T.F. OTERO, Universidad Politecnica de Cartagena, Spain

H-2:IL03 **New Resonance Mode in Dielectric Elastomer Actuators**
JIANWEN ZHAO, YONG GE, SHU WANG, BO HUANG, Harbin Institute of Technology, Weihai, China

H-2:L04 **Theoretical Model of the Stress-composition Interaction for Electrochemical Actuators Based on Single-walled Carbon Nanotubes and Ionic Liquids**
H. RANDRIAMAHAZAKA, Université Paris Diderot, Sorbonne Paris Cité, ITODYS, UMR 7086 CNRS, Paris Cedex, France; KINJI ASAKA, National Institute of Advanced Industrial Science and Technology (AIST), Ikeda, Osaka, Japan

H-2:L05 **Thermodynamics and Stability of Dielectric Elastomer**
LIWU LIU[1], YANJU[1], JINSONG LENG[2], [1]Department of Astronautical Science and Mechanics, Harbin Institute of Technology (HIT), Harbin, China; [2]Centre for Composite Materials, Science Park of Harbin Institute of Technology (HIT), Harbin, China

H-2:L06 **Detection and Quantification of Structural Processes in Conducting Polymers Exchanging Cations**
L. VALERO[1,2], J.G. MARTINEZ[2], T.F. OTERO[2], M. FUCHIWAKI[3], Y.A. ISMAIL[4], [1]Electronic department, Engineering school, Universidad Autónoma del Estado de México, Toluca, México; [2]Centre for Electrochemistry and Intelligent Materials (CEMI), Universidad Politécnica de Cartagena, Aulario II, Cartagena, Murcia, Spain; [3]Kyushu Institute of Technology, Department of Mechanical Information Science and Technology, Iizuka (Fukuoka), Japan; [4]Dept.of Basic Sciences, College of Applied Science, A'Sharqiyah University, Ibra, Oman

Session H-3
Device Development and Integration Technologies

H-3:IL01 **Stretchable Conducting Polymer Electrodes for Soft Actuators**
HIDENORI OKUZAKI, University of Yamanashi, Kofu, Japan

H-3:IL02 **Solid State Electrochemical Microactuator on Soft Substrates**
P. CEDRIC, A. MAZIZ, G.T.M. NGUYEN, F. VIDAL, LPPI, University of Cergy-Pontoise, Cergy, France; M. BENFETRIT, C. SOYER, E. CATTAN, IEMN, CNRS, Villeneuve D'Ascq, France

H-3:IL03 **Skin-inspired Multimodal Sensors for Soft Robots**
I. GRAZ, Soft Matter Physics, Johannes Kepler University, Linz, Austria

H-3:IL04 **IPMC Actuators Fabricated Using MEMS Technology**
SHIGEKI TSUCHITANI[1], K. KIKUCHI[1], I. SHIMIZU[2], T. TANIGUCHI[2], H. MIKI[1], [1]Department of Systems Engineering, Wakayama University, [2]Graduate School of Systems Engineering, Wakayama University, Wakayama, Japan

H-3:IL05 **Interpenetrating Polymer Networks for Novel Actuators**
C. PLESSE, G.T.M. NGUYEN, **F. VIDAL**, LPPI / Université de Cergy Pontoise, Neuville sur Oise, France

H-3:IL06 **Miniaturized Dielectric Elastomer Actuators (DEA): Towards Intelligent Soft Machines**
H. SHEA, EPFL, Neuchatel, Switzerland

H-3:IL07 **Humanoids and the Role of Electroactive Materials/ Mechanisms in Advancing their Capability**
Y. BAR-COHEN, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

H-3:L08 **Comparison of Annealing Treatments on Contact Resistance between Au Contacts and IGZO Semiconductor on TFTs on Shape Memory Polymer**
G. GUTIERREZ-HEREDIA, O. RODRIGUEZ, J. ESPINOZA, R. REIT, W. VOIT, University of Texas at Dallas, Richardson, TX, USA

Session H-4
Applications of EAPs

H-4:IL01 **Organic Bionics Enabled by 3D Printing**
G.G. WALLACE, ARC Centre of Excellence for Electromaterials Science, Intelligent Polymer Research Institute, University of Wollongong, Wollongong, NSW, Australia

H-4:IL02 **Elastomer Transducers**
S.A. CHIBA, Chiba Science Institute, Tokyo, Japan; M. WAKI, Wits Inc., Tochigi, Japan; Y. TANAKA, N. TSURUMI, K. OKAMOTO, K. NAGASE, ROHM Co., Ltd., Kyoto, Japan; M. HOMMA, H. YOKOTA, K. ODAGIRI, H. SATO, T. SAIKI, J. KANEKO, ADEKA Corp., Tokyo, Japan

H-4:IL03 **Electroactive Polymer and its Nanocomposites: Theory, Experiment and Applications**
YANJU LIU[1], LIWU LIU[1], JINSONG LENG[2], [1]Department of Astronautical Science and Mechanics, Harbin Institute of Technology, Harbin, China; [2]Centre for Composite Materials and Structures, Harbin Institute of Technology, Harbin, China

H-4:L04 **A Viscoelastic Soft Dielectric Elastomer Generator Operating in an Electrical Circuit**
R. DENZER, Division of Solid Mechanics, Lund University, Lund, Sweden; E. BORTOT, Department of Civil, Environmental and Mechanical Engineering, University of Trento, Trento, Italy; M. GEI, School of Engineering, Cardiff University, Cardiff, Wales, UK; A. MENZEL, TU Dortmund University, Dortmund, Germany and Division of Solid Mechanics, Lund University, Lund, Sweden

Session H-5
Advances in SMPs

H-5:IL01 **Rewritable Shape Memory Polymers – Materials with Latent Ability to Change Permanent Shapes by Photoirradiation**
C.N. BOWMAN, Department of Chemical and Biological Engineering, University of Colorado, Boulder, CO, USA

H-5:L02 **Fractional Calculus Approach to Viscoelastic Behavior of Amorphous Shape Memory Polymers**
CHANGQING FANG, HUIYU SUN, State Key Laboratory of Mechanics and Control of Mechanical Structures, Nanjing University of Aeronautics and Astronautics, Nanjing, China; JIANPING GU, Department of Materials Engineering, Nanjing Institute of Technology, Nanjing, China

H-5:L03 **Light-matter Concepts in Azobenzene-based Photoresponsive Polymers**
W. OATES, J. BIN, Florida State University, Tallahassee, FL, USA

H-5:IL04 **Cold Hibernated Elastic Memory (CHEM) Structures. Description & Applications**
W. SOKOLOWSKI, Jet Propulsion Laboratory / California Institute of Technology, Pasadena, CA, USA

H-5:IL05 **A Thermomechanical Constitutive Model for Shape Memory Polymer Composites**
HUIYU SUN, JIANPING GU, State Key Laboratory of Mechanics and Control of Mechanical Structures, Nanjing University of Aeronautics and Astronautics, Nanjing, Jiangsu, China

H-5:L06 **Stereolithography 3D Printing of Shape Memory Polymers**
M. LAYANI, M. ZAREK, D. COHN, S. MAGDASSI CASALI, Center for Applied Chemistry, Institute of Chemistry, The Hebrew University of Jerusalem, Jerusalem, Israel

H-5:L07 **Shape Memory Behavior in a Blend of Zinc-neutralized Carboxyl terminated Polybutadiene and Poly(styrene-co-4-vinylpyridine)**
FANG XIE[1,2], R.A. WEISS[2], JINSONG LENG[3], YANJU LIU[1], [1]Department of Astronautical Science and Mechanics, Harbin Institute of Technology, Harbin, China; [2]Department of Polymer Engineering, The University of Akron, Akron, OH, USA; [3]Center for Composite Materials and Structures, Harbin Institute of Technology, Harbin, China

H-5:L08 **Characterization for Carbon Fiber Reinforced Epoxy based Shape Memory Polymer Composite**
FENGFENG LI[1], JIANGUO CHEN[1], LIWU LIU[1], YANJU LIU[1], JINSONG LENG[2], [1]Department of Astronautical Science and Mechanics, Harbin Institute of Technology (HIT); [2]Centre for Composite Materials and Structures, Science Park of Harbin Institute of Technology (HIT), Harbin, P.R. China

Session H-6
Applications of SMPs and their Composites

H-6:IL01 **Novel Behavior in Smart Polymeric Materials: Stress Memory and its Potential Applications**
JINLIAN HU, H. NARAYANA, Institute of Textiles and Clothing, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

H-6:L02 **Form-filling ADP/Chitosan/Ceramic (ACC) Sponge for Potential Use in Bone Defects**
K. JAHAN, M. MEKHAIL, M. TABRIZIAN, McGill University, Montreal, Quebec, Canada

H-6:IL05 **Elastomers with High Elastic Energy Storage Capacity and Shape-actuating Ability**
M. ANTHAMATTEN, YUAN MENG, JISU JIANG, JEY-CHANG YANG, University of Rochester, Rochester, NY, USA

Poster Presentations

H:P01 **Towards a New Class of Green Hibryd Ionic Polymer-polymer Metal Composites**
G. DI PASQUALE[1], **S. GRAZIANI**[2], A. POLLICINO[1], R. PUGLISI[1], V. DE LUCA[2], [1]Dipartimento Ingegneria Industriale (DII), Università di Catania, Catania, Italy; [2]Dipartimento Ingegneria Elettrica Elettronica e Informatica (DIEEI), Università di Catania, Catania, Italy

H:P03 **Conducting Electroactive Polyaniline Thin Films applied as Conductometric pH Sensor**
H.J.N.P.D. MELLO, M. MULATO, Department of Physics, Faculty of Philosophy, Sciences and Letters at Ribeirão Preto, University of São Paulo (USP), Ribeirão Preto, SP, Brazil

H:P04 **Multi-functional Matrix based on Polyurethane and Hybrid Fillers**
K. PETCHAROEN, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

H:P05 **Preparation of Compliant Electrode with Multiwalled Carbon Nanotubes filled Natural Rubber**
P. TANGKITTHANACHOKE, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

H:P06 **Electrically Responsive Material based on Poly(2-Chloroaniline) and Pectin Hydrogel as Actuator**
W. KONGKAEW, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

H:P07 **Efficient Linear Approach for the Closed-loop Control of a Ionic Polymer Bending Actuator**
B. TONDU, A. SIMAITE, P. SOUERES, C. BERGAUD, Electrical Engineering Department, INSA, University of Toulouse and LAAS/CNRS, Toulouse, France

H:P08 **Piezoelectric Fluoroethylenepropylene Films Based on Space Charges and Void Structure: Preparation and Application in Vibration Energy Harvesters**
XIAOQING ZHANG, LIMING WU, School of Physics Science and Engineering, Tongji University, Shanghai, China; G.M. SESSLER, Institute for Telecommunications Technology, Darmstadt University of Technology, Darmstadt, Germany

H:P09 **Effect of Plasticizer Type and Electric Field Strengths on Electromechanical Properties of Poly (lactic acid)**
N. THUMMARUNGSAN, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkron University, Bangkok, Thailand

H:P10 **Two-way Shape Memory Behaviour of Electrospun Non-woven Mats prepared from Sol-gel Crosslinked Poly(ε-caprolactone)**
S. PANDINI[1], S. AGNELLI[1], A. MERLETTINI[2], C. GUALANDI[2], M.L. FOCARETE[2], M. TOSELLI[3], K. PADERNI[4], M. MESSORI[4], [1]Dipartimento di Ingegneria Meccanica e Industriale, Università degli Studi di Brescia, Brescia, Italy; [2]Dipartimento di Chimica "G. Ciamician", Università degli Studi di Bologna, Bologna, Italy; [3]Dipartimento di Chimica Industriale "Toso Montanari", Università degli Studi di Bologna, Bologna, Italy; [4]Dipartimento di Ingegneria "Enzo Ferrari", Università degli Studi di Modena e Reggio Emilia, Modena, Italy

H:P11 **Deformation and Recovery Properties of Shape Memory Polymer Composites Tube**
TIANZHEN LIU, LIWU LIU, YANJU LIU, **JINSONG LENG**, Department of Astronautical Science and Mechanics, Harbin Institute of Technology (HIT), Harbin, P.R. China

H:P12 **Smart Release Devices with much Load based on SMP Composites**
CHENGTONG PAN[1], LIWU LIU[1], YANJU LIU[1], JINSONG LENG[2], [1]Department of Astronautical Science and Mechanics, Harbin Institute of Technology (HIT); [2]Centre for Composite Materials, Science Park of Harbin Institute of Technology (HIT), Harbin, P.R. China

SYMPOSIUM I
NEW CONCEPTS AND ADVANCES IN PHOTOCATALYTIC MATERIALS FOR ENERGY AND ENVIRONMENTAL APPLICATIONS

Oral Presentations

Session I-1
Design Elements and Advanced Concepts for Photo-functional Materials

I-1:IL01 **Nanostructured Materials for Photocatalytic Energy Conversion Applications**
E. SELLI, G.L. CHIARELLO, M.V. DOZZI, Dipartimento di Chimica, Università degli Studi di Milano, Milano, Italy

I-1:IL02 **Solar Fuel Generation Enhanced by Surface Plasmon Resonance**
NIANQIANG WU, Department of Mechanical & Aerospace Engineering, West Virginia University, Morgantown, WV, USA

I-1:IL04 **Z-scheme over all Water Splitting on Rh/K4Nb6O17 Nanosheet Photocatalyst**
HSIN-YU LIN, YU-LIN YE, Department of Materials Science and Engineering, National Dong Hwa University, Hualien, Taiwan

I-1:L05 **Iron Oxide-based Electrocatalysts for Water Oxidation at Neutral pH**
HIROSHI IRIE, K. ISHIKAWA, T. TAKASHIMA, Clean Energy Research Center, University of Yamanashi, Kofu, Yamanashi, Japan

I-1:L06 **Water Splitting Semiconductor Photoanodes**
J. AUGUSTYNSKI, R. SOLARSKA, Centre for New Technologies, University of Warsaw, Warsaw, Poland

I-1:L07 **Bismuth Vanadate-based Heterojunction Photoelectrodes for Photoelectrochemical Water Splitting: Synthesis and Characterisation**
CHONG SIANG YAW[1], **MENG NAN CHONG**[1,2], AI KAH SOH[3], [1]School of Engineering, Chemical Engineering Discipline, Monash University Malaysia, Bandar Sunway, Selangor, Malaysia; [2]Sustainable Water Alliance, Advanced Engineering Platform, Monash University Malaysia, Bandar Sunway, Selangor, Malaysia; [3]School of Engineering, Mechanical Engineering Discipline, Monash University Malaysia, Bandar Sunway, Selangor, Malaysia

I-1:IL08 **Reflections on Rust: Iron Oxide Photoelectrodes for Solar Energy Conversion and Storage**
A. ROTHSCHILD, Department of Materials Science and Engineering, Technion – Israel Institute of Technology, Haifa, Israel

I-1:IL09 **Hybrid Organic/Inorganic Assemblies with Tailored Photoelectrochemical Activity: from Synthetic Aspects to Energy Applications**
C. JANAKY, A. VARGA, A. KORMANYOS, G. SAMU, University of Szeged, Hungary; K. RAJESHWAR, The University of Texas at Arlington, TX, USA

I-1:L10 **Flexible Transparent Conductive Electrodes and Photocatalytic Conversion of CO2 to CO Gas Sensor using Single Crystal Cu Thin Film**
SE-YOUNG JEONG[1,2], I.H. PARK[1], W.K. KIM[3], S. LEE[4], H.Y. PARK[1], Y.J. LEE[1], G.W. LEE[5], [1]Department of Cogno-Mechatronics Engineering, Pusan National University, Miryang, Rep.of Korea; [2]Department of optics and mechatronics engineering, Pusan National University, Miryang, Rep.of Korea; [3]R&D Center, LG Display Co., Ltd., Paju, Rep.of Korea; [4]Materials and Science Engineering, University of Maryland, College Park, Maryland, USA; [5]Korea Research Institute of Standards and Science & Department of Science of Measurement, University of Science and Technology, Daejeon, Rep.of Korea

I-1:L11 **Hybrid Nanostructured Materials for the Harvesting and Conversion of Solar Energy**
J. MATOS, Biomaterials Department, Technological Development Unit, University of Concepción, Parque Industrial Coronel, Concepción, Chile

I-1:IL12 **Electron Trapping in Semiconductor Photocatalysis**
BUNSHO OHTANI[1,2], AKIO NITTA[2], NAOYA MURAKAMI[3], MAI TAKASE[4], [1]Institute for Catalysis, Hokkaido University, Sapporo, Japan; [2]Graduate School of Environmental Science, Hokkaido University, Sapporo, Japan; [3]Graduate School of Engineering, Kyushu Institute of Technology, Kitakyushu, Fukuoka, Japan; [4]Graduate School of Engineering, Muroran Institute of Technology, Muroran, Japan

I-1:IL13 **Doped Lanthanum Ferrite Perovskites: Promising Materials for Photocatalytic Applications**
F. PARRINO[1], E. GARCÍA-LÓPEZ[1], G. MARCÌ[1], L. PALMISANO[1], V. FELICE[2], I. NATALI SORA[2], L. ARMELAO[3], [1]"Schiavello-Grillone" Photocatalysis Group, Dipartimento di Energia, Ingegneria dell'informazione e Modelli matematici (DEIM), University of Palermo, Palermo, Italy; [2]INSTM R.U. Bergamo and Dipartimento di Ingegneria, University of Bergamo, Dalmine, Bergamo, Italy; [3]IENI-CNR and INSTM, Dipartimento di Scienze Chimiche, Università di Padova, Padova, Italy

I-1:L14 **Enhancing Photocatalytic Activity of TiO2 by a Synergistic Effect between Plasmon Resonance in Ag Nanoparticles and Optical Interference**
G. CACCIATO[1,2], M. ZIMBONE[2], M. BAYLE[3], C. BONAFOS[3], V. PRIVITERA[2], M.G. GRIMALDI[1,2], **R. CARLES**[3], [1]Dipartimento di Fisica ed Astronomia-Università di Catania, Catania, Italy; [2]IMM-CNR, Catania, Italy; [3]CEMES-CNRS Université de Toulouse, Toulouse Cedex, France

I-1:L15 **Ternary TiO2-CuxS-Fly Ash System: Synthesis, Characterisation and Application in Adsorption and Photocatalysis**
L. ANDRONIC, M. VISA, A. DUTA, Transilvania University of Brasov, R&D Centre of Renewable Energy Systems and Recycling, Brasov, Romania

I-1:IL16 **Novel Functional Materials Applied to Photocatalysis**
YEN-TING CHEN[1], **KAO-SHUO CHANG**[1,2], [1]Department of Materials Science & Engineering, National Cheng Kung University, Tainan City, Taiwan; [2]Promotion Center for Global Materials Research (PCGMR), National Cheng Kung University

I-1:L17 **Micro-TiO2 as Photocatalyst for New Ceramic Surfaces Activated via Digital Printing**
M. STUCCHI, C.L. BIANCHI, C. PIROLA, Università degli studi di Milano, Milano, Italy; G. CERRATO, Università degli studi di Torino, Torino, Italy; A. DIMICHELE, Università degli studi di Perugia, Perugia, Italy; V. CAPUCCI, GranitiFiandre SpA, Fiorano M.se, Italy

I-1:L18 **Designing Bimetallic Reduction Co-catalysts – Correlating Atomic Structure with Properties**
M. BAR SADAN, Department of chemistry, Ben Gurion University of the Negev, Israel

I-1:L19 **Nanoplasmonics-assisted Degradation of Pollutants and Oxidation of Glycerol under Visible Light**
Z. CHEHADI[1,2], S. ZAID[3,4], J.-S. GIRARDON[3,4], J. TOUFAILY[2], M. CAPRON[3,4], F. DUMEIGNIL[3,4], T. HAMIEH[2], R. BACHELOT[1], S. JRADI[1], [1]Laboratoire de Nanotechnologie et d'Instrumentation Optique, Institut Charles Delaunay, UMR 6281 CNRS, Université de Technologie de Troyes, Troyes Cedex, France; [2]Laboratory of Materials, Catalysis, Environment and Analytical Methods, Faculty of Sciences I, Doctorate School of Science and Technology, Lebanese University, Beirut, Lebanon; [3]Université Lille Nord de France, Lille, France; [4]Unité de Catalyse et de Chimie du Solide, UCCS (UMR CNRS 8181), Villeneuve d'Ascq, France

I-1:L20 **A New Strategy to synthesize TiO2 Mesocrystals with Superior Photocatalytic Activity**
YANNA GUO, HUAN XIE, JIN CHEN, HUI LI, BINGYU LEI, **LEI ZHOU**, School of Life Science and Technology, Huazhong University of Science and Technology, Wuhan, P.R. China

Session I-2
Understanding Fundaments of Photoinduced Processes and Charge Transport

I-2:IL01 **Understanding Charge Transfer Processes on Metal Oxide Surfaces through Laser Flash Photolysis Analysis**
J. SCHNEIDER[1], I. KRETSCHMER[1], **D. BAHNEMANN**[1,2], [1]Institut für Technische Chemie, Leibniz Universität Hannover, Germany; [2]St. Petersburg State University, St. Petersburg, Russia

I-2:IL02 **Charge-carrier Dynamics in Photocatalytic Processes**
C. COLBEAU-JUSTIN[1], A. HERISSAN[1], S. PIGEOT-RÉMY[2], O. DURUPTHY[2], S CASSAIGNON[2], C. FERRONATO[3], R. HAZIME[3], C. GUILLARD[3], [1]Laboratoire de Chimie Physique, CNRS UMR 8000, Université Paris-Sud, Orsay, France; [2]Chimie de la Matière Condensée de Paris, Collège de France, CNRS UMR 7574, UPMC, Paris, France; [3]IRCELYON, CNRS UMR 5256, Université Lyon 1, Villeurbanne, France

I-2:IL03 **Role of Reduced Graphene Oxide in Promoting the Photoelectrochemical Responses of 1D Oxide-0D Chalcogenide Nanocomposites**
R. SUBRAMANIAN, University of Nevada, Reno Pawan Pathak, University of Nevada, Reno, USA

I-2:L04 **Mimicking in Photocatalysis the Photosynthesis Z Scheme with one Monophasic Material**
J.C. CONESA, R. LUCENA, Inst. de Catálisis y Petroleoquímica, CSIC, Madrid, Spain; P. PALACIOS, **P. WAHNON**, Inst. de Energía Solar, Univ. Politécnica de Madrid, Spain

I-2:IL05 **Molecular Electrets: Effects of Localized Fields on Photo-induced Charge Transfer**
J.M. LARSEN, E.M. ESPINOZA, **V.I. VULLEV**, Department of Bioengineering and Department of Chemistry, University of California, Riverside, CA, USA

I-2:IL06 **Interfacing Light Absorbers with Catalysts for Enhanced Photo(electro)catalysis**
R. BERANEK, Institute of Electrochemistry, Universität Ulm, Germany

I-2:L07 **Optical Characterization of CdTe highly doped with Antimony**
S. COLLINS, I. KHAN, V. EVANI, C. FEREKIDES, University of South Florida, Tampa, FL, USA

I-2:L08 **Kinetics of Photocatalytic, Self-cleaning Surfaces: Connecting Contaminant Removal to Contact Angle Evolution**
D. OLLIS, Chemical Engineering Department, North Carolina State University, USA

I-2:IL09 **Charge Transport and Recombination in Nanostructured Materials for Photoelectrochemical and Solar Cells**
G. OSKAM[1], J. VILLANUEVA-CAB[2], J.A. ANTA[3], [1]Department of Applied Physics, CINVESTAV-IPN, Mérida, Yucatán, México; [2]Instituto de Física, Benemérita Universidad Autónoma de Puebla, Puebla, Pue., México; [3]Area de Química Física, Departamento de Sistemas Físicos, Químicos y Naturales, Universidad Pablo de Olavide, Sevilla, Spain

I-2:IL10 **TiO2 Nanostructures for Energy and Environmental Applications**
M. WARK, Institute of Chemistry, Carl von Ossietzky University Oldenburg, Oldenburg, Germany

I-2:IL11 **Photocatalytic Activation of Biomaterials**
K.H. CHEUNG, P. KOSHY, M.B. PABBRUWE, **C.S. SORRELL**, School of Materials Science and Engineering, UNSW Australia, Sydney, NSW, Australia

I-2:IL12 **Analysis of the Dynamics in Composition of Pt and Ni/NiO promoted SrTiO3 in Overall Water Splitting**
G. MUL, Mesa+ Insitute for Nanotechnology, University of Twente, Enschede, The Netherlands

I-2:IL13 **Metal Oxides for Photoelectrochemical Water Splitting and Environmental Remediation**
S. CARAMORI, V. CRISTINO, N. DALLE CARBONARE, F. RONCONI, C.A. BIGNOZZI, G. LONGOBUCCO, L. PASTI, A. MOLINARI, Department of Chemical and Pharmaceutical Sciences, University of Ferrara, Ferrara, Italy; R. ARGAZZI, CNR/ISOF c/o Department of Chemical and Pharmaceutical Sciences, University of Ferrara, Ferrara, Italy

I-2:IL14 **Organic Photoelectrochemical Cells for Selective Redox Reactions**
A. GUERRERO, Institute of Advanced Materials (INAM), Universitat Jaume I, Castelló, Spain

I-2:L15 **Band Engineering of Titanium Dioxide Relevant to Solar Cells and Photocatalysis**
L. KAVAN, J. Heyrovsky Institute of Physical Chemistry, Prague, Czech Republic

Session I-3
Design Approaches for Advanced Applications

I-3:IL01 **Efficient Solar Driven Water Splitting using a Bipolar Membrane to enable pH-gradients**
D.A. VERMAAS, W.A. SMITH, Delft University of Technology, Department of Chemical Engineering, Materials for Energy Conversion and Storage (MECS). Delft, The Netherlands

I-3:IL02 **Development of Photocatalyst Sheet for Unassisted Sunlight-driven Water Splitting**
T. HISATOMI, K. DOMEN, The University of Tokyo, Tokyo, Japan; Japan Technological Research Association of Artificial Photosynthetic Chemical Process (ARPChem)

I-3:L03 **Quasi-1D Black Titanium Oxide Nanostructures for Water Splitting Applications**
L. MASCARETTI, S. FERRULLI, P. MAZZOLINI, C.S. CASARI, V. RUSSO, A. LI BASSI, Micro and Nanostructured Materials Laboratory, Politecnico di Milano, Milano, Italy; R. MATARRESE, I. NOVA, Laboratory of Catalysis and Catalytic Processes, Politecnico di Milano, Milano, Italy

I-3:IL04 **A Stand Alone Artificial Photosynthesis of Formate from Carbon Dioxide and Water**
HYUNWOONG PARK, School of Energy Engineering, Kyungpook National University, Daegu, Korea

I-3:L05 **Sculpting Photocatalysts on the Nano Scale**
L. AMIRAV, Schulich Faculty of Chemistry, Technion - Israel Institute of Technology, Haifa, Israel

I-3:L06 **A New Strategy for Solar Water Splitting Materials Design**
L. VAYSSIERES, IRCRE, Xian Jiaotong University, Xi'an, China

I-3:IL07 **Bioinspired Photoelectrode Designs for Solar Fuel Generation**
K. RAJESHWAR, University of Texas, Dept of Chemistry & Biochemistry, Arlington, TX, USA

I-3:IL08 **Reduction of Small Molecules in Photocatalytic Systems**
W. MACYK, Faculty of Chemistry, Jagiellonian University, Kraków, Poland

I-3:L09 **TiO2/Pt/SnO2 Multilayer Photo Catalytic Film**
G.O. TESTONI, M.A. ZAGHETE, M.V. NOGUEIRA, J.P.C. COSTA, E.C. AGUIAR, J.A. VARELA, **L. PERAZOLLI**, Araraquara, SP, BRAZIL; UNESP-Chemical Institute - DBTQ

I-3:L10 **Superhydrophilic and Photocatalytic Active Ceramic Glazes for Sanitary Ware**
F. KNIES[1,2], K. SCHRANTZ[1], C. ANEZIRIS[1,2], **T. GRAULE**[1,2], [1]EMPA-Swiss Federal Labs for Materials Science and Technology, Laboratory for High Performance Ceramics, Duebendorf, Switzerland; [2]TU Bergakademie Freiberg, Institute for Ceramics, Glass and Building Materials, Freiberg, Germany

I-3:IL11 **VOCs Removal in Semiconductor Clean Lab Using Fiber-illuminated Honeycomb Reactor**
YI-TING WU, KUNG-TE LU, **JEFFREY C.S. WU**, Department of Chemical Engineering, National Taiwan University, Taipei, Taiwan

I-3:IL12 **Mechanistic Studies of Charge Carriers in Materials for Artificial Photosynthesis**
A.J. COWAN, University of Liverpool, Department of Chemistry, Liverpool, UK

I-3:L13 **Artificial Photosynthesis Device Development for CO2 Photoelectrocatalytic Conversion**
J.F. THOMPSON, BIN CHEN, J. MINUZZO, N. LONDONO, NASA Ames Research Centre, Mountain View, CA, USA; G. WHITING, Palo Alto Research Center (PARC)

I-3:L14 **Photocatalytic Ag/AgCl Polymer Composites**
E.W. TATE, J.H. JOHNSTON, School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand

Poster Presentations

I:P01 **Enhancement of Photocatalytic Reaction by Coupling TiO2 with Graphene Oxide**
H.M. YADAVEM, **JUNG-SIK KIM**, Department of Materials Science and Engineering, University of Seoul, Republic of Korea

I:P02 **Effect of Annealing on the PL and Photocatalytic Properties of Solution Combusted ZnO Nanopowders**
SUNG PARK, JI HYUNG RYU, JUNG EUN PARK, MIN JAE HAN, **JAE CHUN LEE**, Dept. of Materials Science and Engineering, Myongji University, Yongin, Korea

I:P03 **Alkali Metal-doped TiO2 Nanotube Array Films with Enhanced Open Circuit Voltage for Photocatalytic Solar Fuel Generation**
S. ABD EL-NASSER, A. ESAWI, Department of Mechanical Engineering and the Yousef Jameel Science and Technology Research Center, The American University in Cairo, New Cairo, Egypt

I:P04 **Hybrid DFT Study of the Fe:NiOOH OER Catalyst and its Interface to BiVO4**
J.C. CONESA, Inst. de Catálisis y Petroleoquímica, CSIC, Madrid, Spain

I:P05 **Effect of Solvent Additives and P3HT on PDTSTTz/PCBM based Bulk Heterojunction Solar Cells**
A.E. DEJENE, Ministry of Mines and Energy of Ethiopia, Addis Ababa, Bole-13, Ethiopia

I:P06 **ZnO2 Thin Films for Polymer Solar Cells**
MYUNG-SEOK JEON, **DO-HEYOUNG KIM**, School of Chemical Engineering, Chonnam National University, GwangJu, Korea

I:P07 **Flux Coating Fabrication of Nitride and Oxynitride Crystal Layers for Photoanode Applied to Solar Hydrogen Production**
KATSUYA TESHIMA, SAYAKA SUZUKI, SHUJI OISHI, Shinshu University, Nagano, Japan; T. ISHIZAKI, Shibaura Institute of Technology, Japan

I:P08 **Grafting of TiO2 on PMMA Film and Reusability in Photodegradation of Organic Dye under UV and Visible Light Irradiation**
R. KLAYSRI[1], S. WICHAIDIT[1], **O. MEKASUWANDUMRONG**[2], P. PRASERTHDAM[1], [1]Center of Excellence on Catalysis and Catalytic Reaction Engineering, Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand; [2]Department of Chemical Engineering, Faculty of Engineering and Industrial Technology, Silpakorn University, Nakorn Pathom, Thailand

I:P09 **Step by Step toward a Transparent Photo-super-capacitor**
F.R. RAMOS-BARRADO[1], F. MARTÍN[1], J. RODRÍGUEZ[1], E. NAVARRETE[1], M.C. LÓPEZ[1], E.A. DALCHIELE[2], [1]Nanotechnology Unit, Departamentos de Física Aplicada I & Ingeniería Química Facultad de Ciencias, Campus de Teatinos, Universidad de Málaga, Málaga, Spain, [2]Instituto de Física & CINQUIFIMA, Facultad de Ingeniería, Montevideo, Uruguay

SYMPOSIUM J
FUNCTIONAL NANOMATERIALS FOR NEW GENERATION SOLID STATE GAS SENSORS

Oral Presentations

Session J-1
New Nanocarbons (CNTs, Graphene, New 2D Materials)-based Gas Sensors; Nanosilicon-based Gas Sensors

J-1:IL01 **Graphene and 2D Materials Based Gas Sensors**
W. WLODARSKI, School of Electrical and Computer Engineering, RMIT University, Melbourne, Australia

J-1:IL02 **Smell Sensors – Optical or by Electronics?**
W. KNOLL, AIT Austrian Institute of Technology, Vienna, Austria, and Center for Biomimetic Sensor Science, Nanyang Technological University, Singapore

J-1:IL03 **Nanostructured Films as Sensitive Elements for Surface Acoustic Wave (SAW) Sensors: Deposition Methods, Device Characterization and Design Trends**
S.M. BALASHOV, O.V. BALACHOVA, A.V.U. BRAGA, Centro de Tecnologia da Informação Renato Archer, Campinas, Brazil; S. MOSHKALEV, Center for Semiconductor Components, State University of Campinas, Brazil; L.T. KUBOTA, R.A. TIMM, Department of Analytical Chemistry, State University of Campinas, Brazil

J-1:IL04 **High Performance Chemoresistive Gas Sensors based on Self-activated Graphene and Functionalized Graphene**
HO WON JANG, Department of Materials Science and Engineering, Seoul National University, Seoul, Korea

J-1:IL05 **Graphene-based Materials and Nanostructures for Discriminative Gas Sensing**
A. SINITSKII, University of Nebraska - Lincoln, Lincoln, NE, USA

J-1:L06 **Microwatt Power Consumption Gas Sensors based on Decorated Carbon Nanotube**
S. MOSHKALEV, R. SAVU, M. CANESQUI, A. VAZ, Center for Semiconductor Components, UNICAMP, Campinas, SP, Brazil

J-1:L07 **Adsorption Characterization of Fabricated Buckypapers (BPs) for Volatile Organic Compound (VOC) Sampling and Analysis**
JONGHWA OH, C.T. LUNGU, University of Alabama at Birmingham, Birmingham, AL, USA; E.L. FLOYD, University of Oklahoma, Oklahoma City, OK, USA

J-1:L08 **Synthesis and Characterization of Multi Walled Carbon Nanotubes(MWCNTs)/Ag-ZnO Nanocomposite for Photocatalytic and Sensor Applications**
A. WORKIE, Department of Chemistry, Bule Hora University, Bule Hora, Ethiopia; A. TADDESSE, Department of Chemistry, Haramaya University, Haramaya, Ethiopia; S. ADMASSIE, Department of chemistry, Addis Ababa University, Addis Ababa, Ethiopia

Session J-2
Semiconductor/Ion Conduction Oxides-based Gas Nanosensors

J-2:IL01 **Nanostructured Semiconductor Gas Sensors for Detection of Sub-ppm Concentrations**
T. SAUERWALD, M. LEIDINGER, A. SCHÜTZE, Saarland University, Saarbrücken, Germany; J. HUOTARI, J. LAPPALAINEN, Microelectronics and Materials Physics Laboratories, University of Oulu, Oulu, Finland

J-2:IL02 **Detection of Particulate Matter by using Limiting Current-type Oxygen Sensor**
M. NISHIBORI, H. WAKITA, K. SHIMANOE, Kyushu University, Kasuga, Fukuoka, Japan; Y. SADAOKA, Ehime University, Matsuyama, Ehime, Japan

J-2:L03 **Functional Oxide Materials for High Performance SiC-FET Sensors for Indoor Air Quality Control**
D. PUGLISI, M. BASTUCK, M. ANDERSSON, A. LLOYD SPETZ, Linköping University, Linköping, Sweden; M. BASTUCK, A. SCHUETZE, Saarland University, Saarbruecken, Germany; M. ANDERSSON, J. HUOTARI, J. LAPPALAINEN, A. LLOYD SPETZ, University of Oulu, Oulu, Finland; V. KEKKONEN, J. LIIMATAINEN, Picodeon LTD Oy, Ii, Finland

J-2:IL04 **Highly Selective Detection of Methylbenzenes using p-type Oxide Semiconductors**
JONG-HEUN LEE, Department of Materials Science and Engineering, Korea University, Seoul, Republic of Korea

J-2:IL05 **Nanocomposites-based Oxygen Gas Sensors**
M. BREZEANU, B.C. SERBAN, V. AVRAMESCU, C. COBIANU, V. DUMITRU, O. BUIU, A. STRATULAT, Honeywell Romania SRL, Bucharest, Romania; A. DE LUCA, Univ. of Cambridge; S.Z. ALI, Cambridge CMOS Sensors; F. UDREA, Univ. of Cambridge

J-2:IL06 **Effective Design and Fabrication of Harsh Environment and Biomedical Gas Sensors**
P.K. DUTTA, Department of Chemistry and Biochemistry, The Ohio State University, Columbus, OH, USA

J-2:IL07 **Investigating the Selective Behaviour of CuO in Gas Sensing Applications**
S. PALZER[1], J. WÖLLENSTEIN[1,2], J. KNEER[1], [1]Laboratory for Gas Sensors, Department of Microsystems Engineering, University of Freiburg, Germany; [2]Fraunhofer Institute for Physical Measurement Techniques; Freiburg, Germany

J-2:IL08 **Sensitivity and Selectivity of SnO2-based Sensor for CO and H2 Detections**
XING-MIN GUO, JIE-TING ZHAO, XI-TAO YIN, University of Science and Technology Beijing, Beijing, China

J-2:L09 **Synthesis and Gas-sensing Properties of Nanoporous Cobalt Oxide Materials**
S. VETTER, S. HAFFER, T. WAGNER, **M. TIEMANN**, Faculty of Science, Department of Chemistry, University of Paderborn, Germany

J-2:L10 **Low Temperature UV-activated Sensor Platform**
I.N. IVANOV[1], C. JACOBS[1], E. MUCKLEY[1,2], [1]Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, TN, USA; [2]University of Tennessee Knoxville, TN, USA

J-2:L11 **Enhanced Gas Sensing Properties of Different ZnO 3D Hierarchical Structures**
A. FIORAVANTI[1,2], A. BONANNO[1], M. MAZZOCCHI[3], M.C. CAROTTA[4], M. SACERDOTI[5], [1]CNR-IMAMOTER Ferrara, Ferrara, Italy; [2]Dipartimento di Chimica, Università di Parma, Parma, Italy; [3]CNR-ISTEC Faenza, Italy; [4]Consorzio Futuro in Ricerca, Ferrara, Italy; [5]Dipartimento di Fisica e Scienze della Terra, Università di Ferrara, Ferrara, Italy

J-2:IL12 **UV Activated Hollow ZnO Microspheres for Selective VOCs Sensors at Low Temperatures**
XIAOGAN LI, Dalian University of Technology, School of Electronic Science and Technology, Institute for Sensor Technology, Dalian, Liaoning, P.R. China

J-2:IL13 **Electrical Conductivity and Sensitivity of the Nanosized Metal Oxide Gas Sensors**
A.A. VASILIEV, National Research Center "Kurchatov Institute", Moscow, Russia

J-2:IL14 **New Semiconductor Gas Sensor Based on Enhancing Oxygen Partial Pressure**
K. SHIMANOE, N. MA, R. KATO, M. NISHIBORI, Kyushu University, Kasuga, Fukuoka, Japan

J-2:L15 **Self-doped Nanocolumnar Vanadium Oxides for Exhaled Breath Analyzer**
SOO DEOK HAN, H.G. MOON, J.S. KIM, S.J. YOON, C.Y. KANG, Korea Institute of Science and Technology, Seoul, South Korea; S.D. HAN, C.Y. KANG, KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul, South Korea

J-2:L16 **Patterned Laser-grown Nanowires for Hydrogen Isotopes Detection with SAW-sensors**
A. MARCU[1], C. VIESPE[1], I. NICOLAE[1], B. BUTOI[1], D. PAUL[1], L. AVOTINA[1,2], C.P. LUNGU[1], [1]National Institute for Laser Plasma and Radiation Physics, Laser Department, Bucharest-Magurele, Romania; [2]Institute of Chemical Physics, University of Latvia, Riga, Latvia

J-2:L17 **Electronic Dopants in SnO2 and ZnO: Effect for Surface Acidity and Gas Sensor Behavior**
A.V. MARIKUTSA, N.A. VOROBYEVA, M.N. RUMYANTSEVA, **A.M. GASKOV**, Chemistry Department, Moscow State University, Moscow, Russia

J-2:IL18 **Metal Oxide Nanocomposites and Surface Modifications for Chemical Sensing**
M. EPIFANI, CNR-IMM, Lecce, Italy

J-2:L19 **Pulsed Laser Deposited Platinum Decorated Tin Oxide Nanotree Layers as Highly Sensitive Gas Sensing Material**
J. HUOTARI[1], T. HAAPALAINEN[1], T. BAUR[2], C. ALÉPÉE[3], J.PUUSTINEN[1], **J. LAPPALAINEN**[1], [1]Microelectronics and Materials Physics Laboratories, University of Oulu, Oulu, Finland; [2]Laboratory for Measurement Technology, Department of Mechatronics, Saarland University, Saarbrücken, Germany; [3]SGX Sensortech SA, Corcelles-Cormondrèche, Switzerland

J-2:L20 **Engineering Metal Oxide Nanoparticles for Gas Sensing Applications**
XUCHUAN JIANG, Laboratory for Simulation and Modelling of Particulate Systems (SIMPAS), Department of Chemical Engineering, Monash University, Melbourne, VIC, Australia

J-2:L21 **MgO-modified SrMoO4 and Nano-SrMoO4 Sensing Materials for H2 and SO2 Detection at High Temperatures**
E. CIFTYUREK, K. SABOLSKY, **E.M. SABOLSKY**, Department of Mechanical & Aerospace Engineering, West Virginia University, Morgantown, WV, USA

Session J-3
Nanometal-based Gas Sensors; Polymer-based Gas Sensors

J-3:IL01 **Template-assisted Fabrication of Metal Nanostructures for Gas Sensing Applications**
Z.Z. OZTURK, Gebze Technical University, Dept. of Physics, Çayırova Campus, Gebze, Kocaeli, Turkey

J-3:IL02 **Ultra-pure Organically-functionalised Gold Nanoparticles Nano-assemblies for Schottky-diode Gas Sensors**
R. IONESCU, T.G. WELEAREGAY, G. PUGLIESE, Rovira i Virgili University, Tarragona, Spain; U. CINDEMIR, L. ÖSTERLUND, Uppsala University, Uppsala, Sweden and Molecular Fingerprint Sweden AB, Uppsala, Sweden

Session J-4
Nanocomposite/Hybrid/Heterostructure-based Gas Sensors

J-4:IL01 **Nanostructured Hybrid Thin Films for Gas Sensing**
R. RIEDEL, TU Darmstadt, Darmstadt, Germany

J-4:IL02 **Capacitive Chemical Sensors based on Metal-organic Framework/Polymer Composites**
S. SACHDEVA, S.J.H. KOPER, F. KAPTEIJN, E.J.R. SUDHÖLTER, J. GASCON, **L.C.P.M. DE SMET**, Delft University of Technology, Delft, The Netherlands; D. SOCCOL, D. GRAVESTEIJN, NXP Semiconductors, 3001 Leuven, Belgium

J-4:L03 **Plasmon Enhanced MOX Gas Sensor**
N. CATTABIANI, C. BARATTO, G. FAGLIA, E. COMINI, G. SBERVEGLIERI, Sensor Lab, CNR-INO and University of Brescia, Brescia, Italy

J-4:L04 **Organic and Inorganic Photosensitizers for Visible Light Activated MOS Gas Sensors**
M.N. RUMYANTSEVA, A.S. CHIZHOV, A.V. MARCHEVSKY, E.V. PODOLKO, E.V. LUKOVSKAYA, O.A. FEDOROVA, A.M. GASKOV, Moscow State University, Moscow, Russia

J-4:L05 **Green Synthesis of Biopolymer-silver Nanoparticles Composites for Gas Sensing**
S.A. PANDE, Laxminarayan Institute of Technology, Nagpur, India

J-4:IL06 **Nanoscale Metal Oxide-based Heterojunctions for Gas Sensing**
D.R. MILLER, S.A. AKBAR, P.A. MORRIS, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH, USA

J-4:IL07 **Sensing Properties of Diode-type Gas Sensors**
Y. SHIMIZU, T. HYODO, Graduate School of Engineering, Nagasaki University, Nagasaki, Japan

J-4:IL08 **MIP-nanoparticle Composites and Core-shell Nanoparticles leading to Materials with Strongly Enhanced Sensitivity**
P. LIEBERZEIT[1], G. MUSTAFA[1,2], W. CUYPERS[1], M. ZEILINGER[1], K. NAVAKUL[1,3], C. SANGMA[3], [1]University of Vienna, Faculty for Chemistry, Department of Analytical Chemistry, Vienna, Austria; [2]Quaid-e-Azam University, Islamabad, Pakistan; [3]Kasetsart University,Faculty of Sciences, Department of Chemistry, Bangkok, Thailand

Poster Presentations

J:P01 **Study of Al-ZnO Thin Films Deposited by RF Magnetron Sputtering for Gas Sensor Application**
G.W.A. CARDOSO[1], G. LEAL[1], A.S. DA SILVA SOBRINHO[2], D.M.G. LEITE[2], **M. MASSI**[1,2], [1]Federal University of São Paulo – Science and Technology Institute, São José dos Campos, SP, Brazil; [2]Technological Institute of Aeronautics, Plasmas and Processes Laboratory, São José dos Campos, SP, Brazil

J:P02 **Crystalline Size Dependent Effect on the Gas Sensing Properties of ZnO Films based on Quantum Dots**
J.F. DENG, **QIUYUN FU**, D.X. ZHOU, W. LUO, Y.X. HU, Z.P. ZHENG, School of Optical and Electronic Information, Huazhong University of Science & Technology, Hongshan District, Wuhan City, P.R. China

J:P03 **Enhancement of Hydrogen Sulfide Gas Sensing of Cadmium-doped ZnO Films based on ZnO QDs**
J.F. DENG, Q.Y. FU, D.X. ZHOU, W. LUO, Y.X. HU, **ZHIPING ZHENG**, School of Optical and Electronic Information, Huazhong University of Science & Technology, Hongshan District, Wuhan City, P.R. China

J:P04 **Hydrogen Gas Sensors based on Palladium/Silicon Oxide/Silicon Carbide Semiconductor Structures**
J. NEAMTU[1], F. CRACIUNOIU[2], D. OVEZEA[1], R. PASCU[2], V. MARINESCU[1], [1]National Institute for Research&Development in Electrical Engineering, Bucharest Romania; [2]National Institute for R&D in Microtechnology, Bucharest, Romania

J:P05 **Synthesis of Polyindole by Emulsion Polymerization: Effects of Oxidant and Surfactant Types**
K. PHASUKSOM, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

J:P06 **Synthesis of Poly(p-phenylene) Nanoparticles: Effects of Surfactants and Dopants on Electrical Conductivity**
P. CHOEICHOM, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

SYMPOSIUM K
NON-VOLATILE MEMORY DEVICES: MATERIALS, EMERGING CONCEPTS AND APPLICATIONS

Oral Presentations

Session K-1
Resistance Switching Memories (ReRAM)

K-1:IL01 **New Trends and Progress in Redox-based Resistive Switching Memories**
I. VALOV, Research Centre Juelich, Electronic Materials (PGI-7), Juelich, Germany

K-1:IL02 **Structural Changes and Conductive Filament Formation in Silicon Oxide during Resistance Switchings**
A.J. KENYON[1], A. MEHONIC[1], M. BUCKWELL[1], L. MONTESI[1], M. SINGH MUNDE[1,2], D. GAO[3], S. HUDZIAK[1], R.J CHATER[4], S. FEARN[4], D. MCPHAIL[4], M. BOSMAN[2], A.L. SHLUGER[3], [1]Department of Electronic & Electrical Engineering, UCL, London, UK; [2]Institute of Materials Research and Engineering, Singapore; [3]Department of Physics and Astronomy and London Centre for Nanotechnology, University College London, London, UK; [4]Department of Materials, Imperial College London, London, UK

K-1:L03 **Impact of Cation-stoichiometry on Switching Speed and Data Retention in SrTiO3 Thin Film Devices**
N. RAAB, C. BÄUMER, S. MENZEL, R. DITTMANN, Peter Gruenberg Institut, Forschungszentrum Juelich GmbH, Juelich, Germany; K. FLECK, Institut fuer Werkstoffe der Elektrotechnik (IWE-2), RWTH Aachen, Aachen, Germany

K-1:L04 **Investigation of Ions Movement during the Operation of Al2O3-Based CBRAM using Thermodynamic and Kinetic Approaches**
C. NAIL, P. BLAISE, G. MOLAS, M. BERNARD, A. ROULE, A. TOFFOLI, L. PERNIOLA, CEA/LETI, Grenoble, France; C. VALLÉE, CNRS/LTM, Grenoble, France

K-1:L05 **Resistive Switching and Nanoscale Electronic Transport in Au/Nb:SrTiO3 Schottky Junctions**
R. BUZIO, A. GERBI, E. BELLINGERI, CNR-SPIN Institute for Superconductivity, Innovative Materials and Devices, Genova, Italy; A.S. SIRI, D. MARRÉ, Physics Department, University of Genova, Genova, Italy

K-1:IL06 **Switching Mechanisms in Binary Metal Oxide based RRAM**
B. MAGYARI-KOPE, Y. NISHI, Stanford University, Stanford, CA, USA

K-1:IL07 **Challenges and Opportunities of RRAM for Innovative Applications**
D. DELERUYELLE, M. BOCQUET, J.-M. PORTAL, Im2np UMR CNRS 7334 and Aix-Marseille Université, France

K-1:L08 **Switching Performance of CMOS Integrated HfO2-based Resistive Memory Cells**
C. WENGER[1], E. PEREZ[1], A. GROSSI[2], C. ZAMBELLI[2], P. OLIVO[2], [1]IHP GmbH - Leibniz Institute for innovative microelectronics, Frankfurt, Germany; [2]Department Engineering ENDIF, Universitá degli Studi di Ferrara, Ferrara, Italy

K-1:L09 **Ab-initio Modeling of the Evolution of Oxygen Vacancies due to Heating and Electric Fields in HfO2-RRAM**
L. SEMENTA, M. MONTORSI, L. LARCHER, University of Modena and Reggio Emilia, Modena, Italy

K-1:L10 **Potential Fluctuation in RRAM based on Non-stoichiometric Hafnium Sub-oxides**
D.R. ISLAMOV[1,2], V.N. KRUCHININ[1], V.SH. ALIEV[1], T.V. PEREVALOV[1,2], V.A. GRITSENKO[1,2], I.P. PROSVIRIN[3], O.M. ORLOV[4], A. CHIN[5], [1]Rzhanov Inst.of Semiconductor Physics SB RAS, Novosibirsk, Russian Fed.; [2]Novosibirsk State University, Novosibirsk, Russian Fed.; [3]Boreskov Inst. of Catalysis SB RAS, Novosibirsk, Russian Fed.; [4]JSC Molecular Electronics Research Inst., Zelenograd, Russian Fed.; [5]National Chiao Tung University, Hsinchu, Taiwan

K-1:IL11 **3D Vertical Integration of Resistive Switching Memory**
MING LIU, QING LUO, XIAOXIN XU, HANGBING LV, QI LIU, SHIBING LONG, Key Laboratory of Microelectronics Devices and Integrated Technology, Institute of Microelectronics, Chinese Academy of Sciences, Beijing, China

K-1:IL12 **Different Applications of Memristors Enabled by Selector Devices**
J. JOSHUA YANG, University of Massachusetts, Amherst, MA, USA

K-1:L13 **Switching Kinetics of Ta2O5-based ReRAM: Limiting Processes and Ultimate Switching Speed**
S. MENZEL[1], A. MARCHEWKA[2], B. RÖSGEN[1], W. KIM[1], V. HAVEL[2], K. FLECK[2], V. RANA[1], U. BÖTTGER[2], D. WOUTERS[1], R. WASER[1,2], [1]Forschungszentrum Jülich, Peter Grünberg Institut (PGI-7), Jülich, Germany; [2]RWTH Aachen, Institut für Werkstoffe der Elektrotechnik (IWE 2), Aachen, Germany

K-1:IL14 **Engineering Defect Levels and Strain Fields as Functional Oxide Building Blocks for Novel ReRAM Architectures**
R. SCHMITT, E. SEDIVA, R. KOROBKO, F. MESSERSCHMITT, S. SCHWEIGER, M. KUBICEK, J.L.M. RUPP, ETH Zurich, Department of Materials, Electrochemical Materials, Zurich, Switzerland

K-1:L15 **Si-Ag Memristive Structures**
C. DIAS, L.M. GUERRA, J. VENTURA, IFIMUP and IN - Institute of Nanotechnology, and Dept. of Physics and Astronomy, Faculty of Sciences, University of Porto, Porto, Portugal; H. LV, S. CARDOSO, P.P. FREITAS, INESC-MN and IN - Institute of Nanoscience and Nanotechnology, Lisboa, Portugal

K-1:L16 **The Resistive Switching Behavior of ZnO Films Depending on Li Dopant Concentration and Electrode Materials**
A. IGITYAN, Y. KAFADARYAN, N. AGHAMALYAN, S. PETROSYAN, Institute for Physical Research of NAS of Armenia, Ashtarak, Armenia

K-1:IL17 **Memristor Device Modeling based on Physical and Dynamical Measurements**
J.P. STRACHAN, S. KUMAR, C. GRAVES, E. MERCED-GRAFALS, R.S. WILLIAMS, Hewlett Packard Labs, Palo Alto, CA, USA

K-1:IL18 **Study of the Resistive Switching Effect using a Three Terminal Bipolar Device**
E. YALON, Technion, Israel Institute of Technology, Haifa, Israel, Current address: Stanford University, Stanford, CA, USA; D. RITTER, Technion, Israel Institute of Technology, Haifa, Israel

K-1:L19 **Understanding of the Combined Threshold and Memory-Type Resistive Switching Behavior in Pt/NbOx/Ti/Pt Cells built from Amorphous Nb2O5 Films**
S. HOFFMANN-EIFERT[1], **C. FUNCK**[1,2], N. ASLAM[1], S. MENZEL[1], E. LINN[2], R. WASER[1,2], [1]Forschungszentrum Juelich, PGI-7, and JARA-FIT, Juelich, Germany; [2]Institute of Materials in Electrical Engineering and Information Technology, RWTH Aachen University, Germany

K-1:IL20 **Morphology-assisted Electrical Memory Performances of Well-defined Brush Polymers**
MOONHOR REE, SUNGJIN SONG, JINSEOK LEE, DONGWOO WI, YONGJIN KIM, HOYEOL LEE, BRIAN J. REE, POSTECH, Dept. of Chemistry, Division of Advanced Materials Science, Pohang Accelerator Laboratory, and Polymer Research Institute Pohang, Republic of Korea

Session K-2
Phase Change Memories (PCM)

K-2:IL01 **Phase-change Memories for Energy-efficient Data-centric IT Applications**
P. FANTINI, Micron - Process R&D, Vimercate, Italy

K-2:IL02 **Epitaxial Chalcogenide Superlattices for Memory Application**
R. CALARCO, Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany

K-2:IL03 **Advances in Nanowire-based Phase Change Memories**
M. LONGO, Laboratory MDM, IMM-CNR, Agrate Brianza, Italy

K-2:L05 **Epitaxial Trigonal Ge-Sb-Te Alloys: Model Materials for Future Low Energy Consumption Non-volatile Memory Applications?**
H. HARDTDEGEN[1], S. RIESS[1], M. SCHUCK[1], K. KELLER[1], P. JOST[2], M. BORNHÖFFT[3], H. DU[4], A. SCHWEDT[3], J. MAYER[3,4], G. ROTH[5], G. MUSSLER[1], M. VON DER AHE[1], D. GRÜTZMACHER[1], M. MIKULICS[1], [1]Peter Grünberg Institute (PGI 9) and JARA - Fundamentals of Future Information Technology, Forschungszentrum Jülich GmbH, Germany; [2]I. Physikalisches Institut (IA), RWTH Aachen University; [3]Central Facility for Electron Microscopy, RWTH Aachen University, Germany; [4]Ernst Ruska-Centre, Forschungszentrum Jülich GmbH, Germany; [5]Institute for Crystallography, RWTH Aachen University, Germany

K-2:L06 **Au-catalyzed Synthesis and Characterization of In-Ge-Te Nanowires by MOCVD**
R. CECCHINI[1], S. SELMO[1,2], C. WIEMER[1], M. FANCIULLI[1,2], E. ROTUNNO[3], L. LAZZARINI[3], L. CACCAMO[4], A. WAAG[4], B. SHEEHAN[5], S. MONAGHAN[5], K. CHERKAOUI[5], P.K. HURLEY[5], M. LONGO[1], [1]Laboratorio MDM, IMM-CNR, Unità di Agrate Brianza, Agrate Brianza, (MB), Italy; [2]Dipartimento di Scienza dei Materiali, University of Milano Bicocca, Milano, Italy; [3]IMEM-CNR, Parma, Italy; [4]Institut für Halbleitertechnik and Laboratory for Emerging Nanometrology, Technische Universität Braunschweig, Braunschweig, Germany; [5]Tyndall National Institute, University College Cork, Dyke Parade, Cork - Ireland

K-2:L07 **Operation Fundamentals of Phase Change Memory Devices based on Ge-rich GST Materials and Featuring High Reliability Performances**
V. SOUSA, G. NAVARRO, N. CASTELLANI, M. COUÉ, O. CUETO, C. SABBIONE, V. DELAYE, F. FILLOT, P. NOÉ, L. PERNIOLA, CEA-LETI, Grenoble Cedex, France; S. BLONKOWSKI, STMicroelectronics, Crolles, France; P. ZULIANI, R. ANNUNZIATA, STMicroelectronics, Agrate Brianza, Italy

K-2:IL08 **Atomistic Simulations of the Heterogeneous Crystallization of Phase Change Materials**
M. BERNASCONI, Department of Materials Science, University of Milano-Bicocca, Milano, Italy; A. BOUZID, C. MASSOBRIO, Institut de Physique et Chimie des Materiaux de Strasbourg, University of Strasbourg-CNRS, Strasbourg, France; S. CARAVATI, Department of Chemistry, University of Zurich, Zurich, Switzerland

K-2:IL09 **Phase-change Memory: the Role of Lone-pair Electrons**
A.V. KOLOBOV, P. FONS, J. TOMINAGA, Nanoelectronics Research Institute, National Institute for Advanced Industrial Science and Technology (AIST), Tsukuba, Japany

K-2:L10 **Integrated All-photonic Data Storage Enabled by Phase-change Materials**
C. RIOS[1], M. STEGMAIER[2], P. HOSSEINI[1], C.D. WRIGHT[3], W. PERNICE[2,4], H. BHASKARAN[1], [1]Department of Materials, University of Oxford, Oxford, UK; [2]Institute of Nanotechnology, Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany; [3]Department of Engineering, University of Exeter, Exeter, UK; [4]Department of Physics, University of Muenster, Muenster, Germany

K-2:L11 **Phase Change Material based Non-volatile Optoelectronic Interface for Optical Systems**
G. RODRIGUEZ HERNANDEZ, P. HOSSEINI, C. RIOS, H. BHASKARAN, Oxford University, Department of Materials, Oxford, UK; C.D. WRIGHT, University of Exeter, Engineering Department, Exeter, UK

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

K-3:IL01 **Nano Spintronics Devices for CMOS Integration**
HIDEO OHNO, Laboratory for Nanoelectronics and Spintronics, RIEC; Center for Spintronics Integrated Systems; Center for Innovative Integrated Electronics; WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan

K-3:IL02 **Ferroelectric HfO2 for Non-volatile Memory Devices**
U. SCHROEDER, T. SCHENK, M. HOFFMANN, C. RICHTER, M. PEŠIĆ, F. FENGLER, S. SLESAZECK, NaMLab gGmbH, Dresden, Germany; T. MIKOLAJICK, Chair of Nanoelectronic Materials, TU Dresden, Dresden, Germany; R. MATERLIK, C. KÜNNETH, A. KERSCH, Munich University of Applied Sciences, Munich, Germany; X. SANG, J.M. LEBEAU, North Carolina State University, Raleigh, NC, USA; S.V. KALININ, Oak Ridge National Laboratory, Oak Ridge, TN, USA

K-3:L03 **Hafnium Oxide based Ferroelectrics prepared by Chemical Solution Deposition**
S. STARSCHICH, U. BÖTTGER, RWTH Aachen University, Institut für Werkstoffe der Elektrotechnik II, Aachen, Germany

K-3:L04 **Toward Experimental Implementation of HfO2 based Ferroelectric Tunnel Junctions**
A. CHERNIKOVA, D. NEGROV, **A. ZENKEVICH**, Moscow Institute of Physics and Technology, Dolgopdrudny, Moscow region, Russia

K-3:L05 **Formation of Nanoscale BaTiO3 MOSCAPs for Ferroelectric Field Effect Transistor Application**
P. PONATH, A. POSADAS, University of Texas at Austin, Austin, TX, USA; M. SCHMIDT, P. HURLEY, R. DUFFY; Tyndall National Institute, University, Cork, Ireland; A.A. DEMKOV; University of Texas at Austin, Austin, TX, USA

K-3:IL06 **Nonvolatile Resistive Switching in Interface-engineered Ferroelectric Junctions**
A. SAWA, A. TSURUMAKI-FUKUCHI, Y. TOYOSAKI, H. YAMADA, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan

K-3:IL07 **Polarization-enabled Electronic Properties of Hybrid 2D-ferroelectric Structures**
A. GRUVERMAN, Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, USA

K-3:L08 **Leakage Currents in FeRAM Capacitors: Mechanisms and Correct Interpretation**
A. SIGOV, K. VOROTILOV, YU. PODGORNY, MIREA, Moscow, Russia

K-3:L09 **Memristive and Magnetoresistive Properties of SrTiO3 based Junctions**
I. BERGENTI, P. GRAZIOSI, A. RIMINUCCI, L. VISTOLI, M. CALBUCCI, F. BORGATTI, V. DEDIU, ISMN CNR, Bologna, Italy; D. MACLAREN, School of Physics and Astronomy, University of Glasgow, UK

K-3:IL10 **Advances and Challenges in STT-MRAM Technology**
V. NIKITIN, D. APALKOV, R. CHEPULSKYY, R. BEACH, S. SCHAFER, V. VOZNYUK, Z. DUAN, M. KROUNBI, Samsung Electronics, Semiconductor R&D Center, San Jose, CA, USA

K-3:IL11 **Magnetic Ratchet for Three-dimensional Spintronic Memory and Logic**
D. PETIT, R. LAVRIJSEN, J.-H. LEE, R. MANSELL, A. FERNANDEZ-PACHECO, R.P. COWBURN, University of Cambridge, Cambridge, UK

K-3:IL12 **Controlling Domain Wall Motion by Electric Field in CoFeB-MgO Devices with Perpendicular Anisotropy**
D. RAVELOSONA[1], L. HERRERA DIEZ[1], Y. LIU[1], W. LIN[1], J.P. ADAM[1], N. VERNIER[1], G. AGNUS[1], B. OCKER[2], J. LANGER[2], E.E. FULLERTON[3], [1]Institut d'Electronique Fondamentale, Université Paris-Sud - CNRS, UMR8622, Orsay, France; [2]Singulus Technologies AG, Kahl am Main, Germany; [3]Center for Magnetic Recording Research, University of California San Diego, La Jolla, CA, USA

K-3:IL13 **Integrating MTJ Devices into a 130nm CMOS Process Flow**
M. BUCHBINDER, TowerJazz, Migdal Ha'emek, Israel

K-3:IL14 **Multibit Self-referenced Thermally Assisted MRAM**
Q. STAINER[1,2], L. LOMBARD[1], K. MACKAY[1], C. DUCRUET[1], S. BANDIERA[1], R.C. SOUSA[2], G. VINAY[2], I.L. PREJBEANU[2], **B. DIENY**[2], [1]Crocus Technology SA, Grenoble, France; [2]SPINTEC, CEA/INAC, CNRS, Univ.Grenoble Alpes, Grenoble, France

K-3:L15 **Toward Sub-20 nm Magnetic Tunnel Junction for Embedded Cache Memory**
TOSHIHIRO SUGII, HIDEYUKI NOSHIRO, YUICHI YAMAZAKI, CHIKAKO YOSHIDA, YOSHIHISA IBA, Fujitsu Limited, Atsugi, Japan

K-3:L16 **Controlling of GMR Effect in MgO based Magnetic Tunnel Junctions**
K. MUJASAM BATOO, King Abdullah Institute for Nanotechnology, King Saud University, Riyadh, Saudi Arabia

Session K-4
Memristive Materials, Devices and Emerging Applications

K-4:IL01 **Recent Investigations on the Response of a Tantalum Oxide Memristor to Different Excitations**
R. TETZLAFF, Chair of Fundamentals of Electrical Engineering, Institute of Circuits and Systems, Faculty of Electrical and Computer Engineering, Technische Universität Dresden, Germany

K-4:L02 **Memory Loss in a Tantalum Oxide Memristor**
A. ASCOLI, R. TETZLAFF, Institut fuer Grundlagen der Elektrotechnik und Elektronik, TUD, Dresden, Germany; L.O. CHUA, Department of Electrical Engineering and Computer Sciences, University of California Berkeley, Berkeley, CA, USA; J.P. STRACHAN, R.S. WILLIAMS, Hewlett Packard Labs, Palo Alto, CA, USA

K-4:IL03 **Efficient Implementation of Deep Neural Network with Spike Coding and Resistive RAM based Synapses**
O. BICHLER, CEA, LIST, Gif-sur-Yvette, France; D. GARBIN, CEA, LETI, Minatec Campus, Grenoble, France; E. VIANELLO, CEA, LETI, Minatec Campus, Grenoble, France; D. ROCLIN, CEA, LIST, Gif-sur-Yvette, France; C. GAMRAT, CEA, LIST, Gif-sur-Yvette, France

K-4:IL04 **RRAM for New Computing Paradigms Beyond von Neumann Architecture**
BIN GAO, J.F. KANG, Institute of Microelectronics, Peking University, Beijing, China

K-4:IL06 **Learning Synapses and Neuromorphic Circuits using Oxide-based Resistive RAM**
D. IELMINI, DEIB, Politecnico di Milano, Italy

K-4:L07 **HfO2-based Memristive Device for Neuromorphic Computation**
S. BRIVIO[1], E. COVI[1], M. FANCIULLI[1,2], S. SPIGA[1], [1]Laboratorio MDM, IMM-CNR, Agrate Brianza, Italy; [2]Dipartimento di Scienza Dei Materiali, Università di Milano Bicocca, Milano, Italy

K-4:L08 **Synaptic Functionality of Nanoscale HfO2 based Memristors in Crossbars**
Yu. MATVEYEV, R. KIRTAEV, A. FETISOVA, D. NEGROV, A. ZENKEVICH, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia

K-4:L09 **Emulation of Neural Dynamics with Memristive Devices**
M. ZIEGLER[1], M. HANSEN[1], M. IGNATOV[1], A. PETRARU[1], K. OCHS[2], H. KOHLSTEDT[1], [1]Nanoelektronik, Technische Fakultät, Christian-Albrechts-Universität zu Kiel, Kiel, Germany; [2]Lehrstuhl für Digitale Kommunikationssysteme, Ruhr-Universität Bochum, Bochum, Germany

K-4:L10 **Bismuth Ferrite Thin Films with Mobile and Fixed Donors for Novel Memory Applications**
H. SCHMIDT[1], TIANGUI YOU[1], NAN DU[1], D. BÜRGER[1], I. SKORUPA[1,2], T. MIKOLAJICK[3], O.G. SCHMIDT[1,4], [1]Material Systems for Nanoelectronics, TU Chemnitz, Chemnitz, Germany; [2]HZDR Innovation GmbH, Dresden, Germany; [3]NaMLab gGmbH, Dresden, Germany; [4]Institute for Integrative Nanosciences, IFW Dresden, Dresden, Germany

K-4:IL11 **Phase Change Materials for Neuromorphic Computing**
M. SALINGA, RWTH Aachen University, Aachen, Germany

K-4:IL12 **Non-von Neumann Computing using Phase Change Devices**
A. SEBASTIAN, IBM Research - Zurich, Rüschlikon, Switzerland

K-4:IL13 **Artificial Synpases based on Ferroelectric Tunnel Junctions**
V. GARCIA[1], S. BOYN[1], G. LECERF[2], B. XU[3], S. FUSIL[1], L. BELLAICHE[3], M. BIBES[1], A. BARTHÉLÉMY[1], S. SAÏGHI[2], J. GROLLIER[1], [1]Unité Mixte de Physique, CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France; [2]Univ. Bordeaux, IMS, UMR 5218, Talence, France; [3]Department of Physics and Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, Arkansas, USA

K-4:IL14 **Ferroelectric Memristors for Neural Network Applications**
Y. NISHITANI, Y. KANEKO, M. UEDA, Panasonic Corporation, Seika, Kyoto, Japan

Poster Presentations

K:P01 **Direct Observation of Local Hot Electron Transport through Metal/HfO2/TiN Resistive Switching Devices**
A. GERBI, R. BUZIO, D. MARRE, E. BELLINGERI, CNR-SPIN Institute for Superconductors, Innovative Materials and Devices, Genova, Italy; G. TALLARIDA, S. BRIVIO, S. SPIGA, CNR-IMM Institute for Microelectronics and Microsystems, Laboratorio MDM-IMM-CNR, Agrate Brianza (MB), Italy

K:P02 **Impact of Electrode and Oxide Thicknesses on the ReRAM Performance of Metal/TiOx/Al2O3/Metal Nano Cross-point Structures with Oxides grown by Atomic Layer Deposition**
HEHE ZHANG, A. HARDTDEGEN, S. HOFFMANN-EIFERT, Forschungszentrum Juelich, PGI-7, and JARA-FIT, Juelich, Germany

K:P03 **Charge Transport and Characterization of Freestanding Ge1Sb2Te4 Platelets integrated in Coplanar Strip Lines**
M. MIKULICS[1], M. SCHUCK[1], P. JOST[2], R. ADAM[3], S. RIESS[1], Y.C. ARANGO[1], H. LÜTH[1], D. GRÜTZMACHER[1], H. HARDTDEGEN[1], [1]Peter Grünberg Institute (PGI 9) and JARA – Fundamentals of Future Information Technology, Forschungszentrum Juelich GmbH, Germany; [2]I. Physikalisches Institut (IA), RWTH Aachen University; [3]Peter Grünberg Institute (PGI 6) and JARA - Fundamentals of Future Information Technology

K:P04 **Iron Based Nanomaterials on Silicon: Formation, Morphology and Magnetic Properties**
N.I. PLUSNIN, IACP FEB RAS, Vladivostok, Russia; V.V. PAVLOV, P.A. USACHEV, IPTI RAS, St. Petersburg, Russia

K:P05 **Structural, Dielectric and Ferroelectric Behavior in Bi1-xLaxFe1-yNiyO3 (x = 0.0, 0.1; y = 0.0, 0.05) Multiferroic Ceramics**
A. KUMAR[1], P. SHARMA[2], QI LI[1], D. VARSHNEY[2], [1]Department of Physics, Southeast University, Nanjing, P.R. China; [2]School of Physics, Devi Ahilya University, Indore, India

K:P06 **Room Temperature Structure and Multiferroic Properties of Sm modified BiFeO3 Ceramics**
P. SHARMA[1], A. KUMAR[2], D. VARSHNEY[1], QI LI[2], [1]Materials Science Laboratory, School of Physics, Vigyan Bhawan, Devi Ahilya University, Indore, India; [2]Department of Physics, Southeast University, Nanjing, P.R. China

K:P07 **Improvement of FeRAM Capacitor Properties: Lead Excess Role and Two-step Crystallization Process**
K. VOROTILOV, A. SIGOV, D. SEREGIN, MIREA, Moscow, Russia

K:P08 **Relevant Characteristics of Magnetic, PL, and CL based on GaMnN**
JUWON LEE[1], **YOON SHON**[1], C.S. PARK[2], E.K. KIM[2], [1]Quantum-functional Semiconductor Research Center, Dongguk University-Seoul, Seoul, Republic of Korea; [2]Quantum-Function Spinics Laboratory and Department of Physics, Hanyang University, Seoul, Republic of Korea

K:P09 **Dynamic Control of Colossal Magnetoresistance and Insulator-metal Transition by a Memristive Switch**
ZHI-HONG WANG[1], Q.H. ZHANG[1,2], G. GREGORI[3], Y. YANG[1], L. GU[1], J.R. SUN[1], C.W. NAN[2], B.G. SHEN[1], H.-U. HABERMEIER[3], [1]Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, China; [2]Department of Materials Science and Engineering, Tsinghua University, Beijing, China; [3]Max-Planck-Institute for Solid State Research, Stuttgart, Germany

K:P10 **Fabrication of Floating Gates based on Al@Al2O3 Core-shell Nanoparticles and Memory Properties for Nonvolatile Applications**
JONG-HWAN YOON, Department of Physics, Kangwon National University, Chuncheon, Korea

SYMPOSIUM L
SMART AND INTERACTIVE TEXTILES

Oral Presentations

Session L-1
Adaptive/Active Textiles

L-1:IL01 **Interfacial Force Mapping by Artificial Smart Skins**
XIAOMING TAO[1,2], ZHIFENG ZHANG[1], FEI WANG[1], QIAO LI[1], [1]Institute of Textiles and Clothing, The Hong Kong Polytechnic University, Hong Kong, China; [2]Interdisciplinary Division of Biomedical Engineering, The Hong Kong Polytechnic University, Hong Kong, China

L-1:IL02 **Energy Storage Nanofibers by Centrifugal Spinning**
XIANGWU ZHANG, Polymer and Fiber Science Program, Department of Textile Engineering, Chemistry and Science, College of Textiles, North Carolina State University, Raleigh, NC, USA

L-1:IL03 **Adaptive Textile Materials**
S. MINKO, Nanostructured Materials Lab, Department of Textiles, Merchandising, and Interiors, University of Georgia, Athens, GA, USA

L-1:IL04 **Shape-memory Nanocomposite Elastomers filled with Carbon Nanomaterials**
G.C. LAMA[1,2], **G. GENTILE**[1], P. CERRUTI[1], V. AMBROGI[1,2], C. CARFAGNA[1], [1]Institute for Polymers, Composites and Biomaterials of Italian National Research Council (IPCB-CNR), Pozzuoli, Italy; [2]Department of Chemical Engineering, Materials and Industrial Production, University of Napoli, Napoli, Italy

L-1:L05 **Active Textile Materials via Polymer Grafting**
I. LUZINOV, Department of Materials Science and Engineering, Clemson University, Clemson, SC, USA

L-1:L06 **A Design: STEM Approach to Creating a Textile Platform for Programmable Structures**
A. TOOMEY, V. KAPSALI, Royal College of Art, London, UK; Northumbria University, Newcastle, UK

L-1:L07 **Temperature Responsive 3D Nitinol Textile with Adaptive Cross-section**
M. VYSANSKA, K. JANOUCHOVA, Technical University of Liberec, Faculty of Textile Engineering, Liberec, Czech Republic; L. HELLER, P. SITTNER, Institute of Physics AS CR, vi v. i., Prague, Czech Republic

L-1:IL08 **Light Emitting Textile Diffusers for a Photo Dynamic Therapy with Monitoring Possibilities**
Y. OGUZ[1,2], C. COCHRANE[1,2], S.R. MORDON[1,3], **V. KONCAR**[1,2], [1]University Lille Nord de France, Lille, France; [2]ENSAIT, GEMTEX, Roubaix, France; [3]INSERM U 703, Lille University Hospital - CHRU, France

L-1:L09 **Electromechanically Active Textiles for Soft Robotics**
A. MAZIZ[1], A. KHALDI[1], N.-K. PERSSON[2], E.W.H. JAGER[1], [1]Biosensors and Bioelectronics Centre, Dept. of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden; [2]Smart Textiles, University of Borås, Borås, Sweden

L-1:L10 **Textile Materials with SMA Elements for Active Protection against Heat and Flame**
G. BARTKOWIAK, A. DABROWSKA, Central Institute for Labour Protection, National Research Institute, Warsaw, Poland

L-1:L11 **Dispenser printed Actively Controlled Thermochromic Colour Changing Device on Fabric for Smart Fabric Applications**
YANG WEI, Z. AHMED, R. TORAH, J. TUDOR, University of Southampton, Hampshire, UK

L-1:IL12 **Advanced Microgel-functionalised Polyester Textiles Adaptive to Ambient Conditions**
P. GLAMPEDAKI, Pharmathen, R&D Dpt., Pallini, Attiki, Greece

L-1:IL13 **Advances in Photovoltaic Fabrics**
YONG K. KIM, University of Massachusetts, Dartmouth, MA, USA

Session L-2
E-textiles

L-2:IL01 **Printed Electroluminescent Fabrics**
P. CALVERT, New Mexico Tech, Socorro, NM, USA; BIN HU, Dartmouth College, Hanover, NH, USA

L-2:IL02 **Vibration Energy to Electricity Conversion of Electrospun Nanofibers**
JIAN FANG, TONG LIN, Deakin University, Institute for Frontier Materials, Geelong, Australia

L-2:IL03 **Next Generation Wearable Sensors Based on Nanostructured Materials**
A.B. DALTON, University of Surrey, Department of Physics, Guildford, UK

L-2:IL04 **Resistance-invariant Superstretchable Conductor for DC and AC Signal Transmission**
YOURACK LEE, LE VIET THONG, MIN-KYU JOO, YOUNG HEE LEE, **DONGSEOK SUH**, Department of Energy Science, and IBS Center for Integrated Nanostructure Physics (CINAP), Institute for Basic Science, Sungkyunkwan University, Suwon, Korea

L-2:IL05 **Multifunctional Energy Generation System Harnessing Natural Sources**
E. SIORES, The University of Bolton, Bolton, UK

L-2:IL06 **Wearable Biomedical Systems: Enhancing Quality of Life through Technology and Innovation**
S. JAYARAMAN, Georgia Institute of Technology, Atlanta, GA, USA

L-2:IL07 **Electronic Textiles Fabricated using Atomic Layer Deposition**
HAN-BO-RAM LEE, Department of Materials Science and Engineering, Incheon National University, Incheon, Korea

L-2:IL08 **Plastic Electronics as a Versatile Technology based on Organic Semiconductors: Perspectives for Smart Textiles**
D. VANDERZANDE, imo-imomec, Hasselt University, Hasselt, Belgium

L-2:L09 **Hybrid Large-area Thin-film / CMOS System Technology for Wearable Electronics**
S. WAGNER, W. RIEUTORT-LOUIS, J. SANZ-ROBINSON, T. MOY, L. HUANG, Y. HU, Y. AFSAR, J.C. STURM, N. VERMA, Princeton University, Princeton, NJ, USA

L-2:L11 **Organic Bioelectronic Textiles in Health Monitoring**
E. ISMAILOVA, Dep. of Bioelectronics, Ecole des Mines de St-Etienne, Gardanne, France

Session L-3
Functionality, Manufacturing, Application

L-3:IL01 **Aulana® and NgaPure®: Nanogold coloured and Antimicrobial Silver Woollen Textiles – A Journey from Discovery to Commercialisation**
J.H. JOHNSTON, School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand

L-3:IL02 **Reliable Fabric-based Organic Light-emitting Diodes**
KYUNG CHEOL CHOI, SEONIL KWON, WOOHYUN KIM, HYUN CHEOL KIM, SEUNGYEOP CHOI, School of Electrical Engineering, KAIST, Republic of Korea

L-3:IL03 **Resorbable Fibrous Polymers in Terms of Forensic Engineering of Advanced Polymeric Materials**
M. KOWALCZUK, Polish Academy of Sciences, Centre of Polymer and Carbon Materials, Zabrze, Poland; School of Biology, Chemistry and Forensic Science, Faculty of Science and Eng., University of Wolverhampton, UK

L-3:IL05 **One-way Fluid-transport Fabrics and their Functionality**
HONGXIA WANG, HUA ZHOU, TONG LIN, Australian Future Fibers Research and Innovation Centre, Deakin University, Geelong, VIC, Australia

L-3:IL06 **Design of Instructive Fibre Platforms for Tissue Engineering and Drug Delivery Applications**
V. GUARINO, V. CIRILLO, R. ALTOBELLI, L. AMBROSIO, Institute of Polymers, Composites & Biomaterials and Department of Chemical Sciences & Materials Technology, National Research Council of Italy, Naples, Italy

L-3:IL07 **Metal and Metal-oxide Nanoparticles for Textile Applications**
Z. SAPONJIC, M. RADOICIC, V. VODNIK, M. MILOSEVICA, Department of Radiation Chemistry and Physics, Vinča Institute of Nuclear Sciences, University of Belgrade, Serbia; M. RADETIC, Textile Department, Faculty of Technology and Metallurgy, University of Belgrade, Serbia; V. LAZIC, D. MARKOVIC, Innovation Center, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

L-3:IL08 **Manufacturing Nanoyarns for Conventional and Technical End Uses**
G.K. STYLIOS, Heriot Watt University, Scotland, UK

L-3:L09 **Fabrication of Silver-zinc "Battery Fabric" for Applications in SMART Textiles**
A.M. ZAMARAYEVA, I. DECKMAN, CH. CHANG, A.C. ARIAS, Department of Electrical Engineering and Computer Sciences, University of California at Berkeley, Berkeley, CA, USA; M. WANG, D.A. STEINGART, Mechanical and Aerospace Engineering, Andlinger Center for Energy and the Environment, Princeton University, Princeton, NJ, USA

L-3:L10 **New Nanogold Colours for Textiles**
E.G. WRIGGLESWORTH, J.H. JOHNSTON, School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand

L-3:L11 **The Incorporation of Phase Change Material into Soft Armour Inserts: Achieving a Level of Cooling without Compromising Ballistic Protection**
M.F. LING, K. NG, M. MAHONEY, A.P. HUNT, Defence Science and Technology Group, Department of Defence, Melbourne, VIC, Australia

L-3:L12 **Airbrushed Liquid Crystal/Polymer Fibers for Responsive Textiles**
J.L. WEST, J. WANG, A. JAKLI, Liquid Crystal Institute, Kent State University, Kent, OH, USA

L-3:IL13 **Encapsulation of Photochromic Dyes and their Application to Textile Materials**
B. VONCINA, B. NERAL, University of Maribor, Faculty of Mechanical Engineering, Institute for Engineering Materials and Design, Maribor, Slovenia; T. FECZKO, Institute of Materials and Environmental Chemistry, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Research Institute of Chemical and Process Engineering, University of Pannonia, Hungary

L-3:L14 **Highly-elastic Superhydrophobic Fibrous Membranes**
HUA ZHOU, HONGXIA WANG, HAITAO NIU, **TONG LIN**, Deakin University, Geelong, Australia

L-3:L16 **Development and Characterization of Highly Absorbent Antimicrobial Alginate Fibers for Wound Dressings**
M. ASHRAF, S. RIAZ, T.HUSSAIN, Y. NAWAB, A. REHMAN, National Textile University, Faisalababd, Pakistan; M. MUBIN, Agriculture University, Faisalabad, Pakistan

Session L-4
End Uses, Commercial and Applications

L-4:IL01 **Practical Application of Side Emitting Optical Fibres**
J. MILITKY, D. KREMENAKOVA, R. MISHRA, Textile Faculty, Dept. of Material Engineering, Liberec, Czech Republicy

L-4:L02 **Investigation of the Wetting Behaviour of Nanofunctionalised Wool Fabrics**
M.J. COOK, J.H. JOHNSTON, School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand

L-4:L03 **Composites based on Graphene Nanoplatelets in Screen-printable Textiles Electronics**
A. KURCZEWSKA, M. SŁOMA, Central Institute for Labour Protection-National Research Institute, Lodz, Poland

L-4:L04 **Color Tuning in Electroluminescent Textiles**
E. LEMPA, C. GRASSMANN, M. RABE, Niederrhein University of Applied Sciences, Research Insititute for Textile and Clothing, Moenchengladbach, Germany; A. KITZIG, E. NAROSKA, Niederrhein University of Applied Sciences, Institute for Pattern Recognition, Krefeld, Germany

L-4:L05 **Design Proposal of Space Clothes that Supports Lives in the Future Space Tourism Era**
M. OHKUBO[1], M. YAMAMURA[2], J. KANEBAKO[2], L. ISHIGAMI[2], M. XUE[1], T. NOJIMA[1], S. YAMAGUCHI[3], H. UCHIYAMA[2], N. YAMAZAKI[2,4], [1]University of Electro-Communications, Japan; [2]Joshibi University of Art and Design, Japan; [3]Filmmaker; [4]Astronaut

L-4:IL06 **Activate the Potential of your Body: The Antelope Series by Wearable Life Science**
P.G. SCHWARZ, Wearable Life Science GmbH, Nürnberg, Germany

L-4:IL07 **Electrospun Drug-loaded Textiles for Biomedical and Healthcare Applications**
I. BONADIES, Institute for Polymers, Composites and Biomaterials (IPCB), CNR, Pozzuoli (Na), Italy

L-4:L08 **Electroluminescent Textile for Therapeutic Applications**
C. GRASSMANN, E. LEMPA, M. RABE, Niederrhein University of Applied Sciences, Research Institute for Textile and Clothing, Moenchengladbach, Germany; A. KITZIG, E. NAROSKA, Niederrhein University of Applied Sciences, Institute for Pattern Recognition, Krefeld, Germany; B. NEUKIRCH, Niederrhein University of Applied Sciences, Faculty of Health Care, Krefeld, Germany

L-4:L09 **Soft Condensed Matter Hybrid Fiber Sensors for Motion Detection and Vital Funtions**
M. MELNYKOWYCZ, **F. CLEMENS**, Empa Materials Science and Technology, Dubendorf, Switzerland; M. TSCHUDIN, STBL Medical Research AG, Wilen, Switzerland

Poster Presentations

L:P01 **Preparation of Membranes for PEMFC by Electrospinning**
M.F. DE RICCARDIS, D. CARBONE, L. CAPODIECI, M. RE, Italian National Agency for New Technologies, Energy and Sustainable Economic Development Dept. SSPT – Div. PROMAS – Lab. MATAS, Brindisi, Italy

L:P04 **Smart Fabric Design and Printing Platform**
B. POPOV, T. TODOROV, V. MARINOV, S. STOYANOV, V. TODOROV, Grafixoft, Sofia, Bulgaria; R. TORAH, Y. WEI, N. GRABHAM, Y. LI, **J. TUDOR**, Department of Electronics and Computer Science, University of Southampton, Southampton, UK

L:P05 **Risk Assessment of BPA in Thermo-sensitive Textiles**
SHANSHAN HE, Key Laboratory of Textile Science & Technology, Ministry of Education, Donghua University, Shanghai, P.R. China

SYMPOSIUM M
NEXT GENERATION MICRO/NANO SYSTEMS

Oral Presentations

Session M-1
Physical MEMS/NEMS

M-1:IL01 **Fluidic Physical Sensors and Sensor Systems**
B. JAKOBY, Institute for Microelectronics and Microsensors Johannes Kepler University Linz, Austria

M-1:IL02 **Nanophotonic Structures made from Diamond**
W. PERNICE, University of Muenster, Muenster, Germany

M-1:IL03 **Emerging MEMS Devices and Exploitations in the Internet of Things Scenario**
J. IANNACCI, Fondazione Bruno Kessler-FBK, MicroSystems Technology-MST, Research Unit Center for Materials and Microsystems-CMM, Povo, Trento, Italy

M-1:L04 **Coupled Effects in Low Dimensional Nanosystems and their Applications**
R.V.N. MELNIK[1, 2], S. PRABHAKAR[1], [1]MS2Discovery Interdisciplinary Research Institute, Wilfrid Laurier University, Waterloo, ON, Canada; [2]BCAM, Bilbao, Basque Country, Spain

Session M-2
Chemical Micro/Nano-sensors and Systems

M-2:IL01 **Chemical Microsensors and Microsystems for the Food Industry**
C. JIMENEZ-JORQUERA, Instituto de Microelectrónica de Barcelona (IMB-CNM), CSIC. Campus UAB, Bellaterra, Spain

M-2:IL02 **Chemical and Physical Absorption Analysis with Nano-mechanical Resonators**
S. SCHMID, Technical University of Denmark, DTU Nanotech, Lyngby, Denmark

M-2:L03 **Fabrication of Micro Three Dimensional Structures by Two Photon Polymerization with SiO/Resin**
M.G. del R. HERRERA-SALAZAR, H. AKIYAMA, T. NAKAYAMA, H. SUEMATSU, T. SUZUKI, Y. YOSHITAKE, N. YAMADA, T. TAKAHASHI, K. NIIHARA, Nagaoka University of Technology, Nagaoka, Niigata, Japan

M-2:L04 **Nanosized Drug Delivery Biosensors**
H.A. DEHGHANIAN[1], N. HOSSEINABADI[2], [1]Dept. of Materials Engineering, Isfahan Industrial University, Isfahan, Iran; [2]Dept. of Materials Engineering and Metallurgy, Faculty of Engineering, Shiraz branch, Islamic Azad University, Iran

M-2:L05 **Transparent Optical Temperature Mo4+/V3+ co doped Si-Ga-based Nano Glass Ceramics Sensors**
N. HOSSEINABADI[1], H.A. DEHGHANIAN[2], A. RABIEEZADEH[1], S.A. KHOSRAVIFARD[1], [1]Dept. of Materials Engineering and Metallurgy, Faculty of Engineering, Shiraz branch, Islamic Azad University, Shiraz, Iran; [2]Dept. of Materials Engineering, Isfahan University of Technology, Isfahan, Iran

Session M-3
MOEMS/NOEMS

M-3:IL01 **Optical MEMS for Telecom Application**
M. NAKAJIMA, J. YAMAGUCHI, NTT Device Technology Laboratories, Atsugi-shi, Kanagawa, Japan

M-3:IL02 **Optofluidic Sensors and Actuators**
M.J. VELLEKOOP, M. OELLERS, University of Bremen, Institute for MicroSensors, -Actuators and -Systems (IMSAS), MCB, Bremen, Germany

M-3:L03 **Advanced Protective Coatings by Low Temperature Atomic Layer Deposition of HfO2 on Al Surfaces for Micro-mirror Applications**
C. WIEMER, E. CIANCI, A. LAMPERTI, G. TALLARIDA, Laboratorio MDM, IMM-CNR, Agrate Brianza (MB), Italy; M. BERDOVA, S. FRANSSILA, Aalto University, Department of Materials Science and Engineering, Espoo, Finland; M. ZANUCCOLI, C. FIEGNA, Department of Electrical, Electronic and Information Engineering (DEI), Università di Bologna and IUNET, Cesena (FC), Italy; L. LAMAGNA, S. LOSA, S. ROSSINI, R. SOMASCHINI, S. GIOVENI, STMicroelectronics, Agrate Brianza (MB), Italy

M-3:L04 **Optical MEMS Technologies for Infrared Spectroscopy, Sensing and Imaging**
D. SILVA, J. ANTOSZEWSKI, A. KEATING, J. DELL, **L. FARAONE**, The University of Western Australia, Crawley, WA, Australia

Session M-4
Smart Micro-nano System and Components Integration

M-4:IL01 **Giant Piezoelectric Materials for Microelectromechanical Systems**
M.S. RZCHOWSKI, Physics Department, University of Wisconsin-Madison, Madison, WI, USA

M-4:IL02 **MEMS Sensor for Personal Nanoparticle Monitoring**
H.S. WASISTO, W. WU, **E. PEINER**, TU Braunschweig, Inst. of Semiconductor Technology and LENA, Braunschweig, Germany; E. UHDE, Fraunhofer-WKI, MAIC, Braunschweig, Germany

M-4:L03 **Effect of Interfacial Incompatibility on the Stability of 3D Electronic Packages containing Through Silicon Vias (TSV)**
I. DUTTA, H. YANG, M. UPADHYAYULA, L. MEINSHAUSEN, T.K. LEE*, School of Mechanical and Materials Engineering, Washington State University, Pullman, WA, USA; *Dept. of Mechanical and Materials Engineering, Portland State University, Portland, OR, USA

M-4:L04 **Artificial Intelligence integrated Multiscale, Multiphysics Computational Methods for Smart and Multifunctional Materials**
A. MIYAMOTO, P. BONNAUD, R. MIURA, A. SUZUKI, N. MIYAMOTO, N. HATAKEYAMA, M. HARIYAMA, Tohoku University, Sendai, Miyagi, Japan

M-4:L05 **Shape Memory in Micro-patterned Thiol-ene Thermoset Pillars**
W. VOIT, J. SALAZAR, A. JOSHI-IMRE, The University of Texas at Dallas, Richardson, TX, USA

M-4:L06 **New Hybrid Metal-mesogenic Nanosystems**
T.I. SHABATINA, Department of Chemistry, M.V. Lomonosov Moscow State University, Moscow, Russian Federation

M-4:IL07 **Dynamic Field Sensors in Magnetoelectric Hexaferrite Films**
S. ZARE, H. IZADKHAH, **C. VITTORIA**, Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, USA

M-4:L08 **Crystalline Silicon and Colloidal Quantum Dots Heterojunction Devices**
S. MASALA, V. ADINOLFI, J.-P. SUN, S. DEL GOBBO, O. VOZNYY, I.J. KRAMER, I.G. HILL, E.H. SARGENT, University of Napoli "Federico II", Italy

Session M-5
Radio Frequency MEMS

M-5:IL01 **RF MEMS Applications to RF Tuneable Circuits**
R. SORRENTINO, University of Perugia, Perugia, Italy; A. CAZZORLA, P. FARINELLI, L. PELLICCIA, RF Microtech s.r.l. Perugia, Italy

M-5:IL02 **Metamaterials for Sensors and RF Electronics**
F. MARTIN, J. NAQUI, J. BONACHE, CIMITEC, Departament d'Enginyeria Electrònica,Universitat Autònoma de Barcelona, Bellaterra (Barcelona), Spain

Session M-6
Energy Harvesting and Power Supply MEMS

M-6:IL01 **Single-use Paper Fuel Cells**
N. SABATE, Institució Catalana de Recerca i Estudis Avançats (ICREA) and Institut de Microelectronica de Barcelona (IMB-CNM-CSIC), Campus UAB, Bellaterra-Barcelona (Spain); J.P. ESQUIVEL, Department of Bioengineering, University of Washington, Seattle, WA, USA

M-6:IL02 **Alternative Power Sources for Microdevices**
P.D. MITCHESON, Imperial College London, London, UK

M-6:L03 **Comparison between MEMS and Meso Scale Piezoelectric Energy Harvesters**
A.D.T. ELLIOTT, L.M. MILLER; E. HALVORSEN; P.K. WRIGHT; P.D. MITCHESON, Department of Electrical and Electronic Engineering, Imperial College London, London, UK; Alphabet Energy, Hayward, CA, USA; Buskerud and Vestfold University College, Drammen, Norway; University of California, Berkeley, CA, USA; Department of Electrical and Electronic Engineering, Imperial College London, London, UK

Session M-7

Micro(nano)fluidics and Lab on Chip; Bio-MEMS/NEMS

M-7:IL01 **Nanobioengineering for Medical Applications**
J. SAMITIER, IBEC-Institute for Bioengineering of Catalonia, Barcelona, Spain

M-7:IL02 **Soft-interface Design for Highly Sensitive Biosensor**
MADOKA TAKAI, The University of Tokyo, Tokyo, Japan

M-7:L04 **Gas Supply through Agarose Walls in Cell Culturing Microchips**
F. BUNGE, S. VAN DEN DRIESCHE, M.J. VELLEKOOP, Institute of Microsensors, -actuators and –systems (IMSAS), MCB, University of Bremen, Germany

Session M-8

Flexible Sensors Technology

M-8:IL01 **MEMS-based Differential Calorimetry for Biomolecular Characterization**
QIAO LIN, Y. JIA, X. FENG, B. WANG, Department of Mechanical Engineering, Columbia University, New York, NY, USA

M-8:IL02 **Flexible Solution-processed Photodetectors and their Use in X-ray Medical Imagers'**
A. KUMAR[1], D. MOET[1], J.-L. VAN DER STEEN[1], A. VAN BREEMEN[1], S. SHANMUGAM[1], J. GILOT[1], R. ANDRIESSEN[1], M. SIMON[2], W. RÜTTEN[2], A. DOUGLAS[2], R. RAAIJMAKERS[3], P.E. MALINOWSKI[4], K. MYNY[4], **G.H. GELINCK**[1,5], [1]Holst Centre/TNO, Eindhoven, The Netherlands; [2]Philips Research, Eindhoven, The Netherlands; [3]Philips Healthcare, Best, The Netherlands; [4]Department of Large Area Electronics, imec vzw, Leuven, Belgium; [5]Applied Physics Department, TU Eindhoven, Eindhoven, The Netherlands

Poster Presentations

M:P01 **Nanocolumnar VO2 Thin Films as Transducer for Thermal Biosensor**
S.D. HAN, J.S. KIM, **CHONG-YUN KANG**, Korea Institute of Science and Technology, Seoul, South Korea; S.D. HAN, B.Y. KIM, S. NAHM, C.Y. KANG, KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul, South Korea

M:P02 **A Wearable Swallowing Detecting Method based on Nanometer Materials Sensor**
YI KANG, DONG-YI CHEN, M.L. XIA, SHI-JI HOU, Sichuan, China

M:P03 **Sensors of the Surrounding Medium Refractive Index based on Nanoporous Glasses with Silver Nanoparticles**
A. PSHENOVA, O.V. ANDREEVA, D.A. KLYUKIN, A.I. SIDOROV, ITMO University, Saint-Petersburg, Russia

M:P04 **Electrochemical Deposition of Edta on Glassy Carbon Electrode for the Detection of Zinc in Water**
A. TOUATI[1,2], M. BENOUNIS[1], H. BARHOUMI[3], M. BOUROUROU[3], N. MESSAI[4], [1]LCIP, Department of Chemical Engineering, Institute of Science and Technology, University of Khenchela;Route de El Hamma, Khenchela, Algeria; [2]Laboratory of Environment(LE), Department of Chemical Engineering, University of Annaba, Algeria; [3]Laboratory of Physics and Chemistry of Interfaces, Faculty of Sciences of Monastir, Tunisia; [4]UFR SEN, CReSTIC EA3804, University of Reims Champagne-Ardenne Moulin de la Housse, Reims cedex, France

M:P05 **Sensor Sticker for Detection of Fungi Spore Contamination on Bananas**
P. PAPIREDDY VINAYAKA, S. VAN DEN DRIESCHE, R. BLANK, M. KAHALI MOGHADDAM, W. LANG, M.J. VELLEKOOP, Institute for Microsensors, -actuators and -systems (IMSAS), University of Bremen, Bremen, Germany

M:P06 **New Electrode Material: Boron-doped Diamond Compacts**
YU.V. PLESKOV, M.D. KROTOVA, V.V. ELKIN, E.A. EKIMOV*, Frumkin Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences, Moscow, Russia; *Institute for High Pressure Physics, Troitsk, Moscow, Russia

SYMPOSIUM N

PROGRESS IN WEARABLE/WIRELESS AND IMPLANTABLE BODY SENSOR NETWORKS FOR HEALTHCARE APPLICATIONS

Oral Presentations

Session N-1

Advances in Sensing Devices for Biomedical Monitoring

N-1:IL01 **A Multisensor Platform for Metabolomics**
D.R.S. CUMMMING, M. AL-RAWHANI, B.C. CHEAH, C. MARTIN, School of Engineering, Rankine Building, University of Glasgow, Glasgow, UK; M.P. BARRETT, A.I. MACDONALD, Institute of Infection, Immunity and Inflammation, Sir Graeme Davies Building, University of Glasgow, Glasgow, UK

N-1:IL02 **Carbon-ceramic Micro Electrodes for Pace Makers and Similar Biomedical Applications**
G. BLUGAN[1], F. DALCANALE[1], J. GROSSENBACHER[2], H. TEVAEARAI[3], J. BRUGGER[2], T. GRAULE[1], J. KUEBLER[1], [1]Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for High Performance Ceramics, Duebendorf, Switzerland; [2]EPFL, Microsystems Laboratory LMIS1, Lausanne, Switzerland; [3]Bern University Hospital, Department of Cardiovascular Surgery, Bern, Switzerland

N-1:IL03 **Tailoring Surfaces' Properties to Produce Materials for Sensitive Signalling of Binding Events**
S.E.J. BELL, School of Chemistry and Chem. Eng., Queen's University, Belfast, UK

N-1:L04 **Wearable Healthcare Devices based on Flexible Electronic Skins**
HYUNHYUB KO[1], HEON SANG LEE[2], MIN PARK[3], GEON-WOONG LEE[4], [1]School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan Metropolitan City, Rep.of Korea; [2]Department of Chemical Engineering, Dong-A University, Busan, Rep.of Korea; [3]Photo-Electronic Hybrids Research Center, Korea Institute of Science and Technology, Seoul, Rep.of Korea; [4]Nano Carbon Materials Research Group, Korea Electrotechnology Research Institute, Changwon, Rep.of Korea

Session N-2

Smart Fabrics and Wearable Patches

N-2:IL01 **The Development of Screen, Inkjet and Dispenser Printing Techniques for Smart Fabric Applications**
R. TORAH, Y. WEI, Y. LI, K. YANG, M. DE VOS, S. BEEBY, J. TUDOR, Department of Electronics and Computer Science, University of Southampton, Southampton, UK

N-2:IL02 **Sensing Garments for Body Segments Reconstruction and Motion Capture**
A. TOGNETTI, Research Center "E. Piaggio" and Information Engineering Department, University of Pisa, Italy

N-2:L03 **Strategic Garment Designs for Self-powered Health Monitoring**
J. JUR, M. YOKUS, A. MYERS, R. FOOTE, F. DIOMEDE, Department of Textile Engineering, Chemistry & Science, North Carolina State University, Raleigh, NC, USA

Session N-3

Wearable and Implantable Sensor Integration

N-3:IL01 **Smart Eyeglasses for Everyday Life**
O. AMFT, University of Passau, Passau, Germany

N-3:IL02 **Advances in Bioelectronics for Retinal Prosthesis**
W. MOKWA, Institute of Materials in Electrical Engineering I, RWTH Aachen University, Aachen, Germany

N-3:IL03 **Implantable Brain Pressure Sensors: State-of-the-art**
S. LEONHARDT, Philips Chair or Medical Information Technology, RWTH Aachen University, Aachen, Germany

Session N-4

Low Power Electronics, Energy Harvesting, Sensor Network Architecture

N-4:IL01 **Energy Harvesting for Wearable Sensors**
Z. LUO, J. SHI, **S.P. BEEBY**, Department of Electronics and Computer Science, University of Southampton, Southampton, UK

N-4:IL03 **Smart Implants for Monitoring Surgical Site Infection**
GUANG-ZHONG YANG, Hamlyn Centre, Imperial College London, UK

Session N-5

Materials Chemistry/Biology and Rapid Prototyping/3D Printing Additive Fabrication Technologies

N-5:IL01 **From Finger Prick Sampling to On-body and Ultimately Implantable Chem/Bio-sensors: The Key Role of Active Fluidics in Realising the Long-term Functional Platforms of the Future**
L. FLOREA, D. BRUEN, W. FRANCIS, A. DUNNE, S. COLEMAN, A. BENAZOUZ, **D. DIAMOND**, INSIGHT Centre for Data Analytics, National Centre for Sensor Research, Dublin City University, Dublin, Ireland

N-5:IL02 **Soft Composite Materials in Bioengineering for Hard Problems in Biomedicine**
JAE-WOONG JEONG, Department of Electrical, Computer, and Energy Engineering, University of Colorado, Boulder, CO, USA

N-5:IL03 **Multimaterial and Multiscale Biofabrication Process for the Future Development of Patient Specific Tissues**
G. VOZZI[1,2], F. MONTEMURRO[2], C. DE MARIA[2], [1]Dipartimento di Ingegneria dell'Informazione, University di Pisa, Pisa, Italy; [2]Research Center "E. Piaggio", University of Pisa, Pisa, Italy

Session N-6

Applications in Healthcare and Personal Health Monitoring

N-6:IL01 **The Role of Wearable Monitor for Healthcare**
TOSHIYO TAMURA, Waseda University, Tokyo, Japan

N-6:L02 **Monitoring of Firefighter's Physiological Parameters by using Advanced Wired Textiles**
G. TARTARE, H.N.M. NGO, L. KOEHL, X. ZENG, GEMTEX, Roubaix, France

N-6:L03 **Simplified 3d Mapping System for Biofied Building using Microsoft Kinect V2 mounted on a Mobile Robot following People**
M. DESTRAC, A. MITA, Department of System Design Engineering, Keio University, Yokohama, Japan

N-6:L04 **Smile Catcher – A Gamification of Smiles to Encourage Social Interaction**
N. FARVE, P. MAES, MIT Media Lab, Cambridge, MA, USA

N-6:L05 **Extraction of Stair Walking Parameters in Living Space by using Kinect v2**
AMI OGAWA, A. YOROZU, A. MITA, M. TAKAHASHI, Graduate School of Science and Technology, Keio University, Kanagawa, Japan; T. BOCK, Chair of Building Realization and Robotics, Technical University of Munich, Germany

Poster Presentation

N:P01 **A Smart Wearable and Autonomous Negative Pressure Device for Wound Monitoring**
B. MELAI[1], P. SALVO[1], N. CALISI[1], C. PAOLETTI[1], V. DINI[2], M. ROMANELLI[2], A. PAOLICCHI[3], V. CASTELVETRO[1], R. FUOCO[1], F. DI FRANCESCO[1], [1]Department of Chemistry and Industrial Chemistry, University of Pisa, Pisa, Italy; [2]Department of Clinical and Experimental Medicine, University of Pisa, Pisa, Italy; [3]Department of Translational Research and New Technologies in Medicine and Surgery, University of Pisa, Pisa, Italy

SYMPOSIUM O

MINING SMARTNESS FROM NATURE FROM BIO-INSPIRED MATERIALS TO BIONIC SYSTEMS

Oral Presentations

Session O-1

Algorithms, Mechanisms and Structures in Nature as Inspiration for Mimicking

O-1:IL01 **Biomimetic Art**
F. SCHENK, Birmingham City University, Birmingham, West Midlands, UK

O-1:IL02 **Order and Disorder in Natural Photonic Systems**
B. WILTS, Adolphe Merkle Institute, Fribourg, Switzerland

O-1:IL03 **Tuning Mechanical Properties of Spider Cuticle by its Composition and by Structural Gradients**
Y. POLITI[1], B. BAR-ON[1], F.G. BARTH[2], P. FRATZL[1], [1]Department of Biomaterial, Max-Planck-Institute of Colloids and Interfaces, Potsdam, Germany; [2]Department of Neurobiology, Faculty of Life Sciences, University of Vienna, Vienna, Austria

O-1:L04 **Introducing Self-healing in a Lattice Spring Model to simulate Bone Fracture and Repair**
F. BOSIA[1], L. BRELY[1], N.M. PUGNO[2,3,4], [1]Department of Physics, University of Torino, Torino, Italy; [2]Laboratory of Bio-Inspired & Graphene Nanomechanics, Department of Civil, Environmental and Mechanical Engineering, University of Trento, Trento, Italy; [3]Center for Materials and Microsystems, Fondazione Bruno Kessler, Povo (Trento), Italy; [4]School of Engineering and Materials Science, Queen Mary University of London, London, UK

O-1:L05 **Structural Integration Design for Enhanced Photoluminescence in Butterfly Wing**
TONGXIANG FAN, School of Materials Science and Eningeering, Shanghai Jiaotong University, Shanghai, China

Session O-2

Bio-inspired and Bio-enabled Materials and Manufacturing

O-2:IL01 **Bio-enabled, Chemically-tailored, Hierarchically-structured, 3-D Materials**
K.H. SANDHAGE, School of Materials Engineering, Purdue University, West Lafayette, IN, USA

O-2:IL02 **Novel Bio-inspired Morphing Materials**
G. LANZARA, K SAMADIKHAH, E. BARRESI, Y. CHEN, Engineering Department, University of Rome, RomaTre, Italy

O-2:IL03 **UV-absorbing Materials based on Natural Marine Sunscreens and Biopolymers**
S.C.M. FERNANDES[1], V. BULONE[1,2], [1]Division of Glycoscience, School of Biotechnology, Royal Institute of Technology (KTH), AlbaNova University Center, Stockholm, Sweden; [2]ARC Centre of Excellence in Plant Cell Walls, School of Agriculture, Food and Wine, University of Adelaide, Waite Campus, South Australia, Australia

O-2:L04 **Transport and Mechanical Properties of Ordered Biomimetic Porous Materials from Freeze Casting and Ionotropic Gelation**
M. KEUPER, K. KLANG, G. BUCK, C. LAUER, **K.G. NICKEL**, University Tuebingen, Applied Mineralogy, Tuebingen, Germany

O-2:L05 **Textile as Artificial Nature - From Synthetic Sea Grass to Fibrous Implants**
N.-K. PERSSON, Smart Textiles Technology Lab, Swedish School of Textiles, University of Borås, Borås, Sweden

O-2:L06 **Multidimensional Biomimetic Synthesis of Magnetic Materials via Selective Mineralization of Ferritin Subunits**
D. CARMONA[1], L. TRECCANI[2], S. LID[3], L. COLOMBI CIACCHI[3,4], [1]Advanced Ceramics, Faculty of Production Engineering, University of Bremen, Germany; [2]Petroceramics Spa, Kilometro Rosso Parco Scientifico Tecnologico, Stezzano, Bergamo, Italy; [3]Hybrid Materials Interfaces, Faculty of Production Engineering, University of Bremen, Germany; [4]MAPEX Center for Materials and Processes, University of Bremen, Germany

Session O-3
Functional Bio-inspired Surfaces and Interfaces

O-3:IL01 **Nanostructuring Surfaces to Control Wetting**
F. SCHELLENBERGER, S. WOOH, N. ENCINAS, P. PAPADOPOULOS, D. VOLLMER, **H.-J. BUTT**, Max Planck Institute for Polymer Research, Mainz, Germany

O-3:L02 **S-layer Lattices as Templates for Molecular Imprinting**
D. PUM, E. LADENHAUF, D.S. WASTL, U.B. SLEYTR, University of Natural Resources and Life Sciences, Vienna, Austria; P.A. LIEBERZEIT, University of Vienna, Vienna, Austria

O-3:L03 **Cell-inspired Mechanoresponsive Interfaces**
M. TIMMERMANN, S.B. GUTEKUNST, **C. SELHUBER-UNKEL**, Dept. Biocompatible Nanomaterials, University of Kiel, Germany

O-3:L04 **Bio-inspired Multifunctional Wrinkle Surface**
HIROSHI ENDO, Department of Mechanical Systems Engineering, Toyama Prefectural University, Imizu, Japan

O-3:IL05 **Biomimetic Design and Manufacturing of Anti-erosion Functional Surfaces Inspired from Desert Scorpion**
ZHIWU HAN, Key Laboratory of Bionics Engineering of Ministry of Education, Jilin University, Changchun, China

O-3:L06 **Nature-inspired Polymeric Nanofur for Environmental Applications: from Oil Spill Cleaning to Frictional Drag Reduction**
M. KAVALENKA, C. ZEIGER, F. VÜLLERS, J. KUMBERG, H. HÖLSCHER, Institute of Microstructure Technology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

O-3:L07 **Spinach Extracts for the Development of Metal Patterns onto Plastic Substrates**
D.E. WATSON, J. MARQUES-HUESO, M.P.Y. DESMULLIEZ, Heriot-Watt University, School of Engineering & Physical Sciences (EPS), Institute of Signals, Sensors and Systems, Microsystems Engineering Centre (MISEC), Edinburgh, Scotland, UK

O-3:L08 **Bioinspired Multi-gradient Surfaces with Water Collection/ Repellency**
YONGMEI ZHENG, School of Chemistry and Environment, Beihang University, Beijing, China

O-3:L09 **Nano-mechanical and Deformation Studies on Shell Structures**
E.K. AMPAW[1], E.K. ARTHUR[1,2], T.O. OWOSENI[1,2], A.I. MALIK[1,3], T. TAN[4], W.O. SOBOYEJO[1,5,6], [1]Department of Materials Science and Engineering, African University of Science and Engineering, African University of Science and Technology (AUST), Abuja Federal Capital Territory, Nigeria; [2]Department of Mechanical Engineering, Kwara State University, Malete, Ilorin, Nigeria; [3]Department of Mechanical Engineering, McGill University, Montreal, Canada; [4]Department of Civil and Environmental Engineering, Vermont University, Burlington, VT, USA; [5]Princeton Institute of Science and Technology of Materials (PRISM), Princeton, NJ, USA; [6]Department of Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ, USA

Session O-4
Bio-inspired Sensors and Actuators

O-4:IL01 **Recent Developments in Bio-inspired Sensors Fabricated by Additive Manufacturing Technologies**
G. KRIJNEN, R. SANDERS, Transducers Science & Technology Group, University of Twente, Enschede, The Netherlands

O-4:IL02 **Nature-inspired DNA-based Sensors**
F. RICCI, University of Rome, Tor Vergata, Rome, Italy

O-4:IL03 **Micromechanics of Vibration Sensors in the Spider Cuticle**
V.V. TSUKRUK, School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA, USA

O-4:L04 **A Bio-inspired Real-time Capable Artificial Lateral Line System for Freestream Flow Velocity Measurements**
C. ABELS[1,2,3], W.M. MEGILL[1], A. QUALTIERI[2], M. DE VITTORIO[2,3], F. RIZZI[2], [1]Rhine-Waal University of Applied Sciences, Faculty of Technology and Bionics, Kleve, Germany; [2]Center for Biomolecular Nanotechnologies @ UNILE, Istituto Italiano di Tecnologia, Arnesano (LE), Italy; [3]Università del Salento, Dip. di Ingegneria dell'Innovazione, Lecce, Italy

Session O-5
Biologically Inspired Systems and Robotics

O-5:IL01 **Bioinspired Micro- and Nanoswimmers**
P. FISCHER, Max Planck Institute for Intelligent Systems, Stuttgart, and Institute of Physical Chemistry, Univ. of Stuttgart, Germany

O-5:IL02 **Biologically Inspired Robots**
P. MANOONPONG, The Maersk Mc-Kinney Moller Institute, Odense, Denmark

O-5:IL03 **Biological Fundaments on Biomimetics of Gecko Locomotion**
ZHENDONG DAI, Institute of Bio-inspired Structure and Surface Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China

O-5:IL04 **Three-dimensional Needle Steering for Neurosurgery - A Biologically Inspired Approach**
R. SECOLI, F.M. RODRIGUEZ Y BAENA, Dept. Mechanical Eng., Imperial College London, London, UK

O-5:L05 **Auto-Gopher II – Wireline Deep Sampler driven by Percussive Piezoelectric Actuator and Rotary EM Motors**
Y. BAR-COHEN[1], K. ZACNY[2], M. BADESCU[1], H.J. LEE[1], S. SHERRIT[1], X. BAO[1], G.L PAULSEN[2], L. BEEGLE[1], [1]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA; [2]Honeybee Robotics Spacecraft Mechanisms Corporation, Pasadena, CA, USA

O-5:L06 **A Climbing Robots based Claws Interlocking with Flexible Material**
AIHONG JI, ZHIHUI ZHAO, NAN JIANG, ZHENDONG DAI, Institute of Bio-Inspired Structure and Surface Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China

Session O-6
Bio-inspired Optics and Photonics

O-6:IL01 **Bioinspired Optical Structure for Enhancement Infrared Absorption**
WANG ZHANG, JUNLONG TIAN, JIAJUN GU, QINGLEI LIU, DI ZHANG, State key lab of metal matrix composites, Shanghai Jiao Tong University, Shanghai, China

O-6:L02 **Omnidirectional Anti-reflection Structures Inspired by the Random Nanostructures of the Glasswing Butterfly (Greta oto)**
R.H. SIDDIQUE, G. GOMARD, **H. HÖLSCHER**, Karlsruhe Institute of Technology, Karlsruhe, Germany

O-6:L03 **Biological Inspiration in Optics and Photonics – Harnessing Nature's Light Manipulation Strategies and Manufacturing Capabilities for Multifunctional Optical Materials**
M. KOLLE, J. SANDT, S. NAGELBERG, A. MCDOUGAL, Mechanical Engineering Department, MIT, Cambridge, MA, USA; LING LI, J. AIZENBERG, School of Engineering and Applied Sciences, Harvard University, USA; P. VUKUSIC, College of Engineering, Mathematics and Physical Sciences, Exeter University, UK

O-6:L04 **Light Management in 2D Disordered Nanostructures of Black Butterfly (Pachliopta aristolochia) Scales**
R.H. SIDDIQUE, Y.J. DONIE, G. GOMARD, H. HÖLSCHER, Karlsruhe Institute of Technology, Karlsruhe, Germany

O-6:IL05 **Morpho-colored Materials having High Reflectance in Wide Angle without Color-change: Multi-developments for Practical Applications**
AKIRA SAITO, Osaka University & RIKEN (SPring-8), Osaka, Japan

O-6:IL06 **Cellulose Photonics: From Nature to Applications**
S. VIGNOLINI, Department of Chemistry, University of Cambridge, Cambridge, UK

O-6:IL07 **Bioinspired Materials Templates by Nature Species**
DI ZHANG, JIAJUN GU, WANG ZHANG, QINGLEI LIU, SHENMING ZHU, HUILAN SU, State Key Lab of Metal Matrix Composites, Shanghai Jiao Tong University, Shanghai, China

Session O-7
Biologically Inspired Functional/Smart Structures

O-7:IL01 **Bioinspired Functional Gel-shell Beads**
M. FISCHLECHNER, Inst. for Life Sciences, University of Southampton, UK

O-7:IL02 **Plant Inspired Smart Materials: Pomelos, Nuts and Metal Foams**
C. FLECK[1], P. SCHÜLER[1], M. THIELEN[2], S. FISCHER[3], P. ZASLANSKY[4], A. BÜHRIG-POLACZEK§, T. SPECK[2], [1]Materials Engineering, Institute of Technology Berlin, Germany; [2]Botanical Garden & Plant Biomechanics Group, University of Freiburg, Germany; [3]Foundry Institute, RWTH Aachen, Germany; [4]Julius Wolff Institute, Charité Berlin, Germany

O-7:IL03 **Creating Artificial Cells using Microfluidics**
O. CES, Dept. of Chemistry and Institute of Chemical Biology, Imperial College London, UK

O-7:L04 **Micro-rockets and Micro-containers obtained through Modifications of Electrospun Polymeric Microtubes**
A. SITT, J. LAHANN, Advanced polymers and bio-materials group Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany; J. SOUKUPOVA, Regional Centre of Advanced Technologies and Materials, Faculty of Science, Palacky University, Olomouc, Czech Republic; D. MILLER, D. VERDI, H. HESS, Dept. of Biomedical Engineering Columbia University, New York, NY, USA

O-7:IL05 **Bio-inspired Design and Fabrication of Multifunctional Nanocomposites**
QINGWEN LI, Suzhou Institute of Nanotech and Nanobionics, Suzhou, China

O-7:L06 **4D Textiles inspired by Hydronastic Systems**
V. KAPSALI, London College of Fashion - University of Arts London, London, UK

O-7:L07 **Tunable Self-assembled Micro/Nano Structures via Wrinkling on Shape-memory Polymers for Mimicking Iridescent Plant Surfaces**
S. SCHAUER, H. HÖLSCHER, Karlsruhe Institute of Technology, Institute of Microstructure Technology, Karlsruhe, Germany

Session O-8
Ongoing and Perspective Applications of Bio-inspired Technologies

O-8:IL01 **Discovery of New peptide Polymers that Display Aqueous Phase Behavior**
A. CHILKOTI, Department of Biomedical Engineering, Duke University, Durham NC, USA

O-8:IL02 **Parallel Computing with Molecular Motors**
H. LINKE, M. LARD, NanoLund, Lund University, Lund, Sweden; T. KORTEN, S. DIEZ, TU Dresden; A. MÅNSSON, Linné University, Kalmar; D. NICOLAU Jr., Molecular Sense; D. NICOLAU Sr., McGill University

O-8:L03 **Biomimetic Hairy Surfaces as Superhydrophobic Transparent Coatings and Translucent Films for Optical Applications**
F. VUELLERS, M.N. KAVALENKA. H. HÖLSCHER, Institute of Microstructure Technology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

Poster Presentations

O:P01 **Materials and Structures of Veins and Lamina in Leaf of Giant Water Lily**
H. KOBAYASHI[1], Y. YABUGAKI[2], K. HORIKAWA[1], T. YAMAUCHI[3], [1]Department of Mechanical Science and Bioengineering, Osaka University, Toyonaka, Japan; [2]Mitsubishi Electric Corporation, Amagasaki, Japan; [3]Department of Material Science and Technology, Niigata University, Niigata, Japan

O:P02 **Hydroxyapatite Derived from Natural Bovine Bone for Biomedical Application**
S. RAMESH, A. NIAKAN, C.Y. TAN, Center for Advanced Manufacturing & Material Processing, Department of Mechanical Engineering, Faculty of Engineering, University of Malaya, Kuala Lumpur, Malaysia

O:P03 **Superhydrophobicity of Surfaces from the Contribution of Topography**
K.A. GROSS, K. STIPRAIS, J. LUNGEVICS, E. JANSONS, L. PLUDUMA, Faculty of Material Science and Applied Chemistry, Riga Technical University, Latvia; B. ANDERSONS, H. SANSONETI, Wood Chemistry Institute, Latvia

O:P04 **Catalyst Infiltration of SOFC Electrodes Assisted by a Bio-surfactant**
O. OZMEN, **K. SABOLSKY**, J.W. ZONDLO, E.M. SABOLSKY, West Virginia University, Morgantown, WV, USA; S. LEE, K. GERDES, National Energy Technology Laboratory – Regional University Alliance (NETL-RUA), U.S. DOE, Morgantown, WV, USA

O:P05 **A Two-dimensional Biomimetic Underwater Active Electro-location Position System based on FFT Feature Extraction Cross Localization Algorithm**
JIEGANG PENG, School of Automation Engineering and Center for Robotics, University of Electronic Science and Technology of China, Chengdu, Sichuan, P.R. China

Special Session O-9/P-5
BIOMIMETIC DESIGN AND MOTION CONTROL IN AUTONOMOUS AND REMOTELY OPERATED UNDERWATER VEHICLES

Oral Presentations

O-9/P-5:IL01 **Bio-inspired Intelligent Global Diagnostic & Control Systems**
R.A. SHOURESHI, SUNWOOK LIM, New York Institute of Technology, Old Westbury, New York, USA; C.M. AASTED, Center for Pain and the Brain, Harvard Medical School P.A.I.N. Group, Boston Children's Hospital, Boston, MA, USA

O-9/P-5:IL02 **Robotic Fish Development for the Next Generation Underwater Vehicle**
IKUO YAMAMOTO, Nagasaki University, Graduate School of Engineering, Nagasaki, Japan

O-9/P-5:L04 **Investigation on the Tail Flexibility Effect by Numerical Simulation with Multi-body System**
JIANXIN HU, University of Oxford, Oxford, UK; Q. XIAO, University of Strathclyde, Glasgow, UK; M. POREZ, F. BOYER, Ecole des Mines de Nantes, Nantes, France; D. PAN, University of Zhejiang, Hangzhou, China

O-9/P-5:L05 **A Creative Approach of Modelling Self-propelled 3DoF Multi-body Fish with OpenFOAM and Coupled External Programme**
ZHENKAI ZHAO, QING XIAO, Department of Naval Architecture, Ocean & Marine Engineering, University of Strathclyde, Glasgow, UK

O-9/P-5:L06 **Numerical Simulation of Fish Swimming and Manoeuvring with their Pectoral Fins**
RUOXIN LI, **QING XIAO**, Department of Naval Architecture, Ocean and Marine Engineering, University of Strathclyde, Glasgow, UK

O-9/P-5:IL07 **An Octopus-inspired Robot**
M. CIANCHETTI, C. LASCHI, The BioRobotics Institute, Scuola Superiore Sant'Anna, Pisa, Italy

O-9/P-5:IL08 **Bionic Sonar Structure and Skin Material inspired by Dolphins**
QIJUN LIU, ZHIMING LIU, JIE YU, ZIXUAN ZHANG, **WENJIAN WU**, National University of Defense Technology, Changsha, Hunan, China

O-9/P-5:IL09 **Lateral Line inspired Pressure Sensory System for Wall Detection**
YIMING XU, **KAMRAN MOHSENI**, Department of Mechanical and Aerospace Engineering, Department of Electrical and Computer Engineering, and Institute for Networked Autonomous Systems, University of Florida, Gainesville, FL, USA

O-9/P-5:IL10 **Inspired by Fish: Evolving, Building, and Controlling Flapping Flexible Propulsive Structures for Aquatic Robots**
J.H. LONG Jr., Vassar College, Poughkeepsie, New York, USA

O-9/P-5:IL11 **Propulsive Performance of Dolphin Based on Numerical Simulation of Standing Swimming**
K. ISOGAI, Kyushu University, Fukuoka, Japan

Poster Presentation

O-9/P-5:P01 **Anthropomorphic Robotic Grasper for Atmospheric Diving Suits (ADS) and Remotely Operated Vehicles (ROV)**
B. GAJJAR, President Vishwa Robotics Robotics, Research Scientist Massachusetts Institute of Technology, Cambridge, MA, USA

Special Session O-10/P-6

BIOMIMETIC MORPHING OF UNMANNED AERIAL VEHICLES

Oral Presentations

O-10/P-6:IL01 **Bio-inspired State Sensing and Awareness for Morphing Fly-by-feel UAVs**
F. KOPSAFTOPOULOS, R. NARDARI, YU-HUNG LI, **FU-KUO CHANG**, Department of Aeronautics and Astronautics, Stanford University, Stanford, CA, USA

O-10/P-6:IL02 **Shape Memory Alloy- and Piezoelectric-based Adaptive Structures for Morphing Aircraft and Wind Turbine Rotors**
D.A. SARAVANOS, Department of Mechanical Engineering & Aeronautics, University of Patras, Patras, Greece

O-10/P-6:L03 **Vision-based Fuzzy Controller for the Quadrotor Tracking a Ground Target**
XUCHAO CHEN[1], ZHIQIANG CAO[1], YUEQUAN YANG[2], CHAO ZHOU[1], MIN TAN[1], [1]Institute of Automation, Chinese Academy of Sciences, Beijing, China; [2]College of Information Engineering,Yangzhou University, China

O-10/P-6:L04 **Parylene Flapping-wings with Self-organized Micro Wrinkles**
H. TANAKA, Tokyo Institute of Technology, Tokyo, Japan; Y. SHIMASUE, I. KITAMURA, H. LIU, Chiba University, Chiba, Japan

O-10/P-6:IL05 **Artificial Hair Sensors - Bioinspired Flight Control Feedback**
B. DICKINSON, United States Air Force Research Laboratory, Eglin Air Force Base, FL, USA

O-10/P-6:IL06 **Aquatic Micro Aerial Vehicles (AquaMAV): From Diving Birds and Flying Fish to Aerial-aquatic Robots**
M. KOVAC, Aerial Robotics Laboratory, Imperial College London, London, UK

O-10/P-6:L07 **Hybrid Fiber Reinforced Composite with Embedded Functionality**
M.H. MALAKOOTI, Department of Aerospace Engineering, University of Michigan, Ann Arbor, MI, USA; B.A. PATTERSON, HYUN-SIK HWANG, Department of Materials Science and Engineering, University of Florida, Gainesville, FL, USA; **H.A. SODANO**, Department of Aerospace Engineering, Department of Materials Science and Engineering, University of Michigan, Ann Arbor, MI, USA

O-10/P-6:L08 **Yaw Control of a Smart Morphing Tailless Aircraft Concept**
L.L. GAMBLE, **D.J. INMAN**, University of Michigan, Ann Arbor, MI, USA

O-10/P-6:IL09 **Bioinspired Morphing Systems and Multi-functionality**
J. KUDVA, NextGen Aeronautics, Inc., Torrance, CA, USA; G. SPEDDING, University of Southern California; R. KORNBLUH, SRI International

O-10/P-6:IL10 **Morphing Aircraft Skin Based on a Woven Strip Structure**
H. TOKUTAKE, Kanazawa University, Kanazawa, Japan

O-10/P-6:L11 **Aerodynamic Performance of a Manduca Sexta Inspired Engineered Wing**
A.M. DELUCA, R.P. O'HARA, Department of Aeronautics and Astronautics, Air Forse Institute of Technology, WPAFB, OH, USA

SYMPOSIUM P

EMBODYING INTELLIGENCE IN STRUCTURES AND INTEGRATED SYSTEMS

Oral Presentations

Session P-1
Smart Materials/Sensors/Actuators/MEMS/NEMS

P-1:IL01 **CNT Transduction for Measuring Composite Shear and Air Flow: Triggering of Autonomous Response**
K. SLINKER[1,2], C. KONDASH[1,2], G. REICH[3], **J. BAUR**[1], [1]Materials and Manufacturing Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, OH, USA; [2]Universal Technology Corporation, Beavercreek, OH, USA; [3]Aerospace Systems Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, OH, USA

P-1:IL02 **Piezoceramic MFC Thin Films Experimental Shear Sensing Response Simulation**
A. BENJEDDOU, Institut Supérieur de Mécanique de Paris, Saint Ouen, France

P-1:IL03 **Shape control by PZT**
H. IRSCHIK, Johannes Kepler University of Linz, Linz, Austria; M. KROMMER, Vienna University of Technology, Vienna, Austria; C. ZEHETNER, Linc Center of Mechatronics, Linz, Austria

P-1:IL04 **Shape Memory Alloys Wires for Engineering Applications. Particular Characteristics of NiTi SMA: From Small to Medium Diameter**
S. CASCIATI, DICA Dept., University of Catania, Siracusa, Italy; M. VECE, Structural Mechanics Dept., Pavia University, Italy; **V. TORRA**, Applied Physics Dept. Polytechnic University of Catalonia, Barcelona, Spain

P-1:L05 **Nano-carbon Cement based Sensors for Smart Structures**
G. AKRAS, G. NOISEUX-LAUZE, J. ORELLANA, Royal Military College of Canada, Kingston, Ontario, Canada

P-1:L06 **Carbon Nanotube Nanocomposites with Enhanced Strength and Damping Capabilities**
G. LANZARA, S. CHAKRABARTI, G. FORMICA, University of Rome, RomaTre, Italy; M. TALÒ, **W. LACARBONARA**, Sapienza University of Rome, Italy

P-1:L07 **Vibroacoustic Behaviour of Periodic Smart Structures**
M. ICHCHOU, C. ZHOU, J.P. LAINE, A. ZINE, Ecole Central de Lyon, Ecully, France

P-1:IL08 **Perspectives of TiNi-based and Fe-based SMA in Vibration Protection of Structures**
A. VOLKOV, F.S. BELYAEV, M.E. EVARD, N.A. VOLKOVA, Saint Petersburg State University, Saint Petersburg, Russia

P-1:L09 **In Situ Monitoring of CFRP's Fatigue Damage due to Manufacturing Flaws using Carbon Nanotube-embedded Spatial Strain Sensor**
YINGJUN ZHAO, S. HOERRMANN, M. SCHAGERL, Institute of Constructional Lightweight Design, Johannes Kepler University Linz, Linz, Austria; C. DOPPLER, Laboratory for Structural Strength Control of Lightweight Constructions, Linz, Austria

P-1:L10 **FBG-Galfenol Integrated Magnetic Field Sensors for Harsh Environments**
D. DAVINO, **C. VISONE**, University of Sannio, Benevento, Italy; M.A. CAPONERO, C. CIANFARANI, A. POLIMADEI, ENEA C.R. Frascati, Frascati, RM, Italy

P-1:L11 **The BaO-B2O3-2AlF3*3LaF3 System as a Basis for Obtaining of a New Class of Ferroelectric Glass-ceramics**
K.A. NALBANDYAN, N.B. KNYAZYAN, Institute of General and Inorganic Chemistry of NAS RA, Yerevan, Armenia

P-1:IL12 **Nonlinear Modeling and Analysis of Electro-active Plates: Stability, Post-buckling Behavior and Nonlinear Vibrations**
M. KROMMER, E. STAUDIGL, Y. VETYUKOV, Institute of Mechanics and Mechatronics, Vienna University of Technology, Vienna, Austria

P-1:IL13 **Dynamics of Shallow Arched Microstructures**
M.I. YOUNIS, Physical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia

Session P-2
Integration Technologies

P-2:IL01 **Development and Application of Some Hybrid Nonlinear Dissipative Devices**
Z. LU, D. ZHANG, Tongji University, China; **S.F. MASRI**, University of Southern California, Los Angeles, CA, USA; X. LU, Tongji University, China

P-2:IL02 **Model Order Reduction in Nonlinear Systems**
L. FARAVELLI, University of Pavia, Pavia, Italy

P-2:IL03 **Bridge Deflection Estimation under Unknown Moving Loads by Fusion of Measured Acceleration and Strain Data**
YING LEI, WEI HUA, Department of Civil Engineering, Xiamen University, Xiamen, China

P-2:IL04 **Advances in Ultrasonic Defect Detection and Imaging in Structures**
T. NGUYEN, S. STERNINI, **F. LANZA DI SCALEA**, Department of Structural Engineering, University of California San Diego, La Jolla, CA, USA

P-2:L05 **A Magnetostrictive Energy Harvesting System for Bridge Structural Health Monitoring**
C.S. CLEMENTE, **D. DAVINO**, A. IELARDI, M.R. PECCE, C. VISONE, University of Sannio, Benevento, Italy

P-2:IL06 **Integrating Modeling Tools with Measurements in Predictions**
C. PAPADIMITRIOU, C. ARGYRIS, Department of Mechanical Engineering, University of Thessaly, Volos, Greece

Session P-3
Smart Structures and Integrated Systems

P-3:IL01 **Multifunctional Design of Materials & Structures: Critical Issues**
B.-L. ("LES") LEE, U.S. Air Force Office of Scientific Research, Arlington, VA, USA

P-3:IL02 **Monitoring of Building for Safety, Security and Soundness**
AKIRA MITA, Department of System Design Engineering, Keio University, Yokohama, Japan

P-3:IL03 **Smart Monitoring System Based on Electromechanical Impedance and Guided Ultrasonic Waves**
A. NASROLLAHI[1], V. GULIZZI[2], **P. RIZZO**[1], [1]University of Pittsburgh, Department of Civil & Environmental, Pittsburgh, PA, USA; [2]Department of Civil, Environmental, Aerospace, and Materials Engineering, University of Palermo, Palermo, Italy

P-3:IL04 **Data Science and Engineering for Structural Health Monitoring**
HUI LI, YUEQUAN BAO, SHUNLONG LI, School of Civil Engineering, Harbin Institute of Technology, Harbin, China

P-3:IL05 **Verification of the Rotation Algorithm with Data from a Three Story Stee Frame Test**
K. BALAFAS, **A. KIREMIDJIAN**, YIZHANG LIAO, R. RAJAGOPAL, Stanford University, Stanford, CA, USA; C.H. LOH, National Taiwan University, Taipei, Taiwan

P-3:IL06 **Structural Control for Large Civil Infrastructure**
S. CASCIATI, University of Catania, Siracusa, Italy; L. ELIA, University of Pavia, Italy

P-3:IL07 **Mobile Wireless Sensor Networks for the Assessment of Civil Infrastructure System Performance: Truck and UAV-based Sensing Systems**
J.P. LYNCH, Department of Civil and Environmental Engineering, Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI, USA

P-3:IL08 **Sparse Solution Techniques in Load and Damage Monitoring Systems**
C.-P. FRITZEN, D. GINSBERG, Dept. of Mechanical Engineering, University of Siegen, Siegen, Germany

P-3:L09 **Wind Turbine Fault Detection through Principal Component Analysis and Statistical Hypothesis Testing**
F. POZO, Y. VIDAL, CoDAlab, Departament de Matemàtiques, Escola Universitària d'Enginyeria Tècnica Industrial de Barcelona (EUETIB), Universitat Politècnica de Catalunya (UPC), Barcelona, Spain

P-3:IL11 **On-line Monitoring of High Speed Rail Systems**
YI-QING NI, Hong Kong Branch of National Rail Transit Electrification and Automation Engineering Technology Research Center, Hong Kong; Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

P-3:IL12 **Adapting Fault-tolerant Control to Integration**
J. RODELLAR, Ch. TUTIVEN, Y. VIDAL, L. ACHO, Universitat Politècnica de Catalunya, Department of Mathematics, Barcelona College of Industrial Engineering, Control Dynamics and Applications Research Group (CoDAlab), Barcelona, Spain

P-3:IL13 **Embodying Inspection and Monitoring Intelligence into Structural Systems**
HOON SOHN, HYUNG JIN LIM, SU YOUNG YANG, JI MIN KIM, JUN LEE, SANG MIN LEE, YOUNG TAK KIM, Department of Civil and Environmental Engineering, KAIST, Daejeon, South Korea

P-3:IL14 **Piezoelectrically Actuated Bimorph Deformable Mirrors for Adaptive Optics**
A. PREUMONT, D. ALALUF, Université Libre de Bruxelles, ULB, Brussels, Belgium

P-3:IL15 **Composite Structures with Nerves of Glass Fibers**
A. GUEMES, Dept. Aeronautics, Universidad Politécnica de Madrid, Madrid, Spain

P-3:L16 **Data Evaluation in Smart Sensor Networks using Inverse Methods and Artificial Intelligence (AI): Towards Real-time Capability and Enhanced Flexibility**
S. BOSSE, Department of Mathematics and Computer Science, University of Bremen, Bremen, Germany; A. LECHLEITER, Center for Industrial Mathematics (ZeTeM), University of Bremen, Bremen, Germany; **D. LEHMHUS**, ISIS Sensorial Materials Scientific Centre, University of Bremen, Bremen, Germany

P-3:L17 **Integrated Sensing, Monitoring and Healing of Composite Systems**
O.S. KUPONU, V. KADIRKAMANATHAN, The University of Sheffield, Sheffield, UK; B. BHATTACHARYA, Indian Institute of Technology Kanpur, Kanpur, India; S.A. POPE, The University of Sheffield, Sheffield, UK

P-3:L18 **Controllable Truss-frame Nodes in Semi-active Damping of Vibrations**
B. POPLAWSKI, C. GRACZYKOWSKI, L. JANKOWSKI, Institute of Fundamental Technological Research (IPPT PAN), Warsaw, Poland

Session P-4
Ongoing and Perspective Applications

P-4:IL01 **Structural Monitoring and Assessment of Composite Structure**
W. OSTACHOWICZ, Polish Academy of Sciences (IMP PAN) and Warsaw University of Technology, Poland

P-4:L03 **Intelligent Materials - Enabling Internet of Things in Steel Industry**
E. HAKANEN, V. ELORANTA, Department of Industrial Engineering and Management, School of Science, Aalto University, Espoo, Finland; T. TURUNEN, Department of Management Studies, School of Business, Aalto University, Helsinki, Finland and Cambridge Service Alliance, University of Cambridge, Cambridge, UK

P-4:IL04 **New Directions of Health Monitoring for Building Structures**
AKIRA NISHITANI, PING XIANG, SHOHEI MARUTANI, Waseda University, Tokyo, Japan; TOMOHIKO HATADA, RYUUTA KATAMURA, Kajima Corporation, Japan

P-4:IL05 **Nonlinear Performance of Hybrid Carbon Fiber Composites embedded with ZnO Nanorods**
M.Y. AL-HAIK, A.Y. BOROUJENI, M. ZAKARIA, **M.R. HAJJ**, Virginia Tech, Blacksburg, VA, USA

P-4:IL06 **Adaptive Self-protection against Shock and Vibrations**
L. JANKOWSKI, C. GRACZYKOWSKI, P. PAWLOWSKI, G. MIKUŁOWSKI, B. POPLAWSKI, R. FARAJ, J. HOLNICKI-SZULC, Institute of Fundamental Technological Research (IPPT PAN), Warsaw, Poland

Special Session O-9/P-5

BIOMIMETIC DESIGN AND MOTION CONTROL IN AUTONOMOUS AND REMOTELY OPERATED UNDERWATER VEHICLES

Oral Presentations

O-9/P-5:IL01 **Bio-inspired Intelligent Global Diagnostic & Control Systems**
R.A. SHOURESHI, SUNWOOK LIM, New York Institute of Technology, Old Westbury, New York, USA; C.M. AASTED, Center for Pain and the Brain, Harvard Medical School P.A.I.N. Group, Boston Children's Hospital, Boston, MA, USA

O-9/P-5:IL02 **Robotic Fish Development for the Next Generation Underwater Vehicle**
IKUO YAMAMOTO, Nagasaki University, Graduate School of Engineering, Nagasaki, Japan

O-9/P-5:L04 **Investigation on the Tail Flexibility Effect by Numerical Simulation with Multi-body System**
JIANXIN HU, University of Oxford, Oxford, UK; Q. XIAO, University of Strathclyde, Glasgow, UK; M. POREZ, F. BOYER, Ecole des Mines de Nantes, Nantes, France; D. PAN, University of Zhejiang, Hangzhou, China

O-9/P-5:L05 **A Creative Approach of Modelling Self-propelled 3DoF Multi-body Fish with OpenFOAM and Coupled External Programme**
ZHENKAI ZHAO, QING XIAO, Department of Naval Architecture, Ocean & Marine Engineering, University of Strathclyde, Glasgow, UK

O-9/P-5:L06 **Numerical Simulation of Fish Swimming and Manoeuvring with their Pectoral Fins**
RUOXIN LI, **QING XIAO**, Department of Naval Architecture, Ocean and Marine Engineering, University of Strathclyde, Glasgow, UK

O-9/P-5:IL07 **An Octopus-inspired Robot**
M. CIANCHETTI, C. LASCHI, The BioRobotics Institute, Scuola Superiore Sant'Anna, Pisa, Italy

O-9/P-5:IL08 **Bionic Sonar Structure and Skin Material inspired by Dolphins**
QIJUN LIU, ZHIMING LIU, JIE YU, ZIXUAN ZHANG, **WENJIAN WU**, National University of Defense Technology, Changsha, Hunan, China

O-9/P-5:IL09 **Lateral Line inspired Pressure Sensory System for Wall Detection**
YIMING XU, **KAMRAN MOHSENI**, Department of Mechanical and Aerospace Engineering, Department of Electrical and Computer Engineering, and Institute for Networked Autonomous Systems, University of Florida, Gainesville, FL, USA

O-9/P-5:IL10 **Inspired by Fish: Evolving, Building, and Controlling Flapping Flexible Propulsive Structures for Aquatic Robots**
J.H. LONG Jr., Vassar College, Poughkeepsie, New York, USA

O-9/P-5:IL11 **Propulsive Performance of Dolphin Based on Numerical Simulation of Standing Swimming**
K. ISOGAI, Kyushu University, Fukuoka, Japan

Poster Presentation

O-9/P-5:P01 **Anthropomorphic Robotic Grasper for Atmospheric Diving Suits (ADS) and Remotely Operated Vehicles (ROV)**
B. GAJJAR, President Vishwa Robotics Robotics, Research Scientist Massachusetts Institute of Technology, Cambridge, MA, USA

Special Session O-10/P-6

BIOMIMETIC MORPHING OF UNMANNED AERIAL VEHICLES

Oral Presentations

O-10/P-6:IL01 **Bio-inspired State Sensing and Awareness for Morphing Fly-by-feel UAVs**
F. KOPSAFTOPOULOS, R. NARDARI, YU-HUNG LI, **FU-KUO CHANG**, Department of Aeronautics and Astronautics, Stanford University, Stanford, CA, USA

O-10/P-6:IL02 **Shape Memory Alloy- and Piezoelectric-based Adaptive Structures for Morphing Aircraft and Wind Turbine Rotors**
D.A. SARAVANOS, Department of Mechanical Engineering & Aeronautics, University of Patras, Patras, Greece

O-10/P-6:L03 **Vision-based Fuzzy Controller for the Quadrotor Tracking a Ground Target**
XUCHAO CHEN[1], ZHIQIANG CAO[1], YUEQUAN YANG[2], CHAO ZHOU[1], MIN TAN[1], [1]Institute of Automation, Chinese Academy of Sciences, Beijing, China; [2]College of Information Engineering,Yangzhou University, China

O-10/P-6:L04 **Parylene Flapping-wings with Self-organized Micro Wrinkles**
H. TANAKA, Tokyo Institute of Technology, Tokyo, Japan; Y. SHIMASUE, I. KITAMURA, H. LIU, Chiba University, Chiba, Japan

O-10/P-6:IL05 **Artificial Hair Sensors - Bioinspired Flight Control Feedback**
B. DICKINSON, United States Air Force Research Laboratory, Eglin Air Force Base, FL, USA

O-10/P-6:IL06 **Aquatic Micro Aerial Vehicles (AquaMAV): From Diving Birds and Flying Fish to Aerial-aquatic Robots**
M. KOVAC, Aerial Robotics Laboratory, Imperial College London, London, UK

O-10/P-6:L07 **Hybrid Fiber Reinforced Composite with Embedded Functionality**
M.H. MALAKOOTI, Department of Aerospace Engineering, University of Michigan, Ann Arbor, MI, USA; B.A. PATTERSON, HYUN-SIK HWANG, Department of Materials Science and Engineering, University of Florida, Gainesville, FL, USA; **H.A. SODANO**, Department of Aerospace Engineering, Department of Materials Science and Engineering, University of Michigan, Ann Arbor, MI, USA

O-10/P-6:L08 **Yaw Control of a Smart Morphing Tailless Aircraft Concept**
L.L. GAMBLE, **D.J. INMAN**, University of Michigan, Ann Arbor, MI, USA

O-10/P-6:IL09 **Bioinspired Morphing Systems and Multi-functionality**
J. KUDVA, NextGen Aeronautics, Inc., Torrance, CA, USA; G. SPEDDING, University of Southern California; R. KORNBLUH, SRI International

O-10/P-6:IL10 **Morphing Aircraft Skin Based on a Woven Strip Structure**
H. TOKUTAKE, Kanazawa University, Kanazawa, Japan

O-10/P-6:L11 **Aerodynamic Performance of a Manduca Sexta Inspired Engineered Wing**
A.M. DELUCA, R.P. O'HARA, Department of Aeronautics and Astronautics, Air Forse Institute of Technology, WPAFB, OH, USA

Session P-7

Security Devices

P-7:L01 **SPARTACUS: Enabling Space Technologies in Security Research**
C. FUGGINI, I. TESFAI, D'Apollonia, Milan, Italy

P-7:L02 **SPARTACUS: Positioning Units for Critical Asset Tracking and Emergency Management**
L. VITTUARI, B. PAVKOVIC, A. GUINAMARD, F. CASCIATI, M. ZANZI, A. GHETTI, L. BERBAKOV, M. VECE, University of Bologna, Bologna, Italy

P-7:L03 **Satellite and Inertial Navigation Solution in Crises Management Operation for First Responders Applications**
A. GHETTI, L. VITTUARI, M. ZANZI, University of Bologna, Bologna, Italy

P-7:L04 **Satellite and Inertial Navigation Solution in Crises Management Operation for Transport and Relief Goods Applications**
F. CASCIATI, S. CASCIATI, L. FARAVELLI, **M. VECE**, University of Pavia, Pavia, Italy

11th International Conference
MEDICAL APPLICATIONS OF NOVEL BIOMATERIALS AND NANOTECHNOLOGY

Oral Presentations

Session Q-1
Advances in Stimuli Responsive, Active and Multi-functional Biomaterials

Q-1:IL01 **Biodegradable Thermoplastic Elastomeric Composites**
P.T. MATHER, E. MCMULLIN, J.M. ROBERTSON, P.A. FALCONE, Syracuse Biomaterials Institute and Biomedical and Chemical Engineering Department, Syracuse University, Syracuse, NY, USA

Q-1:IL02 **Bioinspired and Multifunctional Phospholipid Polymer Nanoparticles**
KAZUHIRO ISHIHARA, The University of Tokyo, Tokyo, Japan

Q-1:IL03 **Nanostructured Biomaterials for Medical and Biological Applications**
J.Y. YING, Institute of Bioengineering and Nanotechnology, Singapore

Q-1:IL04 **Design of Biodegradable Injectable Polymer Systems Exhibiting Temperature-responsive Covalent Hydrogel Formation**
YUICHI OHYA, YASUYUKI YOSHIDA, KEISUKE KAWAHARA, AKINORI KUZUYA, Department of Chemistry and Mterials Engineering, Kansai University, Suita, Osaka, Japan

Q-1:IL05 **Multifunctional Organic Electronics for Cell Sensing and Manipulation**
PEILIN CHEN, Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan

Q-1:L06 **Non-adhesive, Slippery, Antimicrobial Surfaces using Dynamic Surface Lubricant Layers**
B.D. HATTON[1], N. LAVIELLE[2], D. ASKER[1], [1]University of Toronto, Toronto, ON, Canada; [2]ESPCI ParisTech and Ecole Polytechnique, France

Q-1:IL07 **Nitric Oxide -A Key Player for Novel Anti-cancer Immuno-therapeutics-**
YUKIO NAGASAKI, Department of Materials Science and Medical Sciences, Satellite Laboratory, International Center for Materials Nanoarchitectonics (WPI-MANA), University of Tsukuba, Japan

Q-1:IL08 **Design of Nanogel Particles for Capture and/or Release of Target Molecules/Ions**
YU HOSHINO, Kyushu University, Fukuoka, Japan

Q-1:L09 **In Vitro Bioactivity Study of TiCaPCO(N) and Ag-doped TiCaPCO(N) Films in Simulated Body Fluid**
E.V. LEVASHOV, D.V. SHTANSKY, I.V. SUKHORUKOVA, A.N. SHEVEYKO, PH.V. KIRYUKHANTSEV-KORNEEV, E.I. ZAMULAEVA, National University of Science and Technology "MISIS", Moscow, Russia

Q-1:L10 **Translation of Basic Materials Research into Orthopedic Medicine**
K. GALL, Duke University, Durham, NC, USA

Q-1:L11 **Polymer Brushes Grafted Conjugated Polymers for Biomedical Applications**
J. TRAVAS-SEJDIC, J. MALMSTRÖM, A.J. HACKETT, D.E. WILLIAMS, Polymer Electronics Research Centre, School of Chemical Sciences, University of Auckland, New Zealand and MacDiarmid Institute for Advanced Materials and Nanotechnology, New Zealand

Session Q-2
Multifunctional Materials in Tissue Engineering and Regenerative Medicine

Q-2:IL01 **Engineering Anisotropy at Nano- to Macroscale: Towards Bioactive Biomaterials**
S. SANT, Department of Pharmaceutical Sciences, Department of Bioengineering, McGowan Institute for Regenerative Medicine, Pittsburgh, PA, USA

Q-2:IL02 **Cell Encapsulation and Printing**
C. MIGLIARESI, N. CAGOL, D.MANIGLIO, V. LIADUNSKAYA, A. MOTTA, Department of Industrial Engineering and BIOtech Research Center, University of Trento, Italy

Q-2:L03 **Robust Regenerative Engineering of the Shoulder**
R. JAMES, **C.T. LAURENCIN**, Department of Orthopaedic Surgery and The Raymond and Beverly Sackler Center for Biomedical, Biological, Physical and Engineering Sciences, University of Connecticut Health Center, Farmington, CT, USA

Q-2:L04 **Fabrication of Interconnected Porous Calcite from Calcium Sulfate and its Tissue Response**
KUNIO ISHIKAWA, KANJI TSURU, Dept. of Biomaterials, Faculty of Dental Science, Kyushu University, Fukuoka, Japan

Q-2:L05 **Progress in Calcium-magnesium Phospho-silicate Hydraulic Bio-cements**
T. TROCZYNSKI, M. YAGHTIN, Materials Engineering, University of British Columbia, Vancouver B.C., Canada

Q-2:IL06 **Developmentally Inspired Approach to Cartilage Tissue Engineering**
E. JABBARI, University of South Carolina, Columbia, SC, USA

Q-2:IL07 **Supramolecularly Movable Polyrotaxane Surfaces Directing Stem Cell Differentiation**
N. YUI, J.-H. SEO, Tokyo Medical and Dental University, Tokyo, Japan; T. YAMAOKA, S. KAKINOKI, M. HIRATA, National Cerebral and Cardiovascular Center Research Institute, Osaka, Japan

Q-2:IL08 **Enhanced Tissue Infiltration into Porous Scaffolds by Active Growth Factor-immobilizing Technology**
T. YAMAOKA, S. KAKINOKI, National Cerebral and Cardiovascular Center Research Institute, Suita, Osaka, Japan; Y. HASHIMOTO, S. BABA, Osaka Dental University, Chuo-ku, Osaka, Japan

Q-2:L09 **Fabrication of Polylactic Acid (PLA) Scaffolds via Nonsolvent induced Phase Separation Technique**
E. REZABEIGI, P.M. WOOD-ADAMS, **R.A.L. DREW**, Department of Mechanical and Industrial Engineering, Concordia University Montreal, Canada

Q-2:L10 **Synthesis and Characterization of an Innovative Radially-compliant Scaffold for Large Osteochondral Defects: The Honey**
F. SCALERA, B. PALAZZO, A.N. CANCELLI, S. SCIALLA, A. SANNINO, **F. GERVASO**, University of Salento, Lecce, Italy; D. IZZO, Dhitech S.c.a.r.l, Lecce, Italy; A. BARCA, IRCCS San Raffaele Scientific Institute (Section of Lecce), Lecce, Italy; G. PERETTI, IRCCS Istituto Ortopedico Galeazzi, Milan, Italy

Q-2:L11 **Preparation of Gradient-type Decellularized Tissue-polymer Complex for Soft Tissue-polymer Interlinking Device**
A. KISHIDA, Y. ZHANG, K. NAM, T. KIMURA, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan

Q-2:L12 **Collagen Fiber Bio-composite Laminates and Constructs**
M. SHARABI, R. HAJ-ALI, The Fleischman Faculty of Engineering, D. BENAYAHU, Sackler School of Medicine, Y. BENAYAHU, George S. Wise Faculty of Life Sciences,Tel Aviv University, Tel Aviv, Israel

Q-2:L13 **Photoactive Nanofiber Materials**
J. MOSINGER, P. HENKE, J. DOLANSKY, Faculty of Science, Charles University in Prague, Prague, Czech Republic

Q-2:L14 **Nanoporous TiO2 Films produced by Anodizing of Ti-6Al-4V Alloy and their Tribocorrosion Performances for Biomedical Application**
L. BENEA[1], E. DANAILA[1], J.-P. CELIS[2], [1]Competences Center: Interfaces-Tribocorrosion-Electrochemical Systems (CC-ITES), Faculty of Engineering, Dunarea de Jos University of Galati, Galati, Romania; [2]Department of Materials Engineering, Faculty of Engineering, Katholieke Universiteit Leuven, Leuven, Belgium

Session Q-3
Smart Drug/Gene Delivery and Release Systems

Q-3:IL01 **Manipulation of Lipid Bilayer Membranes by Peptide/Cationic Copolymer Complex**
A. MARUYAMA, Tokyo Institute of Technology, Yokohama, Japan

Q-3:IL02 **Injectable Calcium Phosphate Cements for Bone Regeneration: to Aid is to Degrade!**
J.J.J.P. VAN DEN BEUCKEN, Radboudumc, Nijmegen, The Netherlands

Q-3:L03 **Antibacterial Bioglass Coatings for Orthopaedics by HVSFS Suspension Spraying**
I. ARHIRE, R. GADOW, A. KILLINGER, Institute for Manufacturing Technologies of Ceramic Components and Composites, University of Stuttgart, Stuttgart, Germany; A. BERNSTEIN, Musculoskeletal research lab, Clinics of Orthopedics and Trauma Surgery, University of Freiburg, Freiburg, Germany

Q-3:L04 **PolyEthylene (Glycol) Microneedles Devices for Drug Delivery and Diagnostic Applications**
P. DARDANO, A. CALIÒ, J. POLITI, I. REA, L. DE STEFANO, IMM-CNR uos Napoli, Italy; V. DI PALMA, M.F. BEVILACQUA, A. DI MATTEO, ST Microelectronics, Italy

Q-3:L05 **BN Nanoparticles with a Petal-like Surface as Anticancer Drug-delivery System**
D.V. SHTANSKY[1], I.V. SUKHORUKOVA[1], I.V. ZHITNYAK[2], A.M. KOVALSKII[1], A.T. MATVEEV[1], O.I. LEBEDEV[3], X. LI[4], N.A. GLOUSHANKOVA[2], D. GOLBERG[3], [1]National University of Science and Technology "MISIS", Moscow, Russia; [2]N.N. Blokhin Russian Cancer Research Center, Moscow, Russia; [3]CRISMAT, UMR 6508, CNRS-ENSICAEN, Caen, France; [4]National Institute for Materials Science (NIMS), Tsukuba, Ibaraki, Japan

Q-3:IL06 **Advances in Delivery of Stimuli-sensitive Combination Nanopreparations of siRNA and Chemotherapeutic Drugs to Treat Multidrug Resistant Tumors**
V. TORCHILIN, Center for Pharmaceutical Biotechnology and Nanomedicine, Northeastern University, Boston, MA, USA

Q-3:IL07 **Engineering of Enzyme Nano-capsules for Biomedical Applications**
A. KISHIMURA, Department of Applied Chemistry, Faculty of Engineering, Kyushu University, and Center for Molecular Systems, Kyushu University, Japan

Q-3:L08 **Novel Sol Gel Antibiotic Release Coatings for Cementless Arthroplasty Fixations**
R. AKID[1], T. NICHOL[2], **T.J. SMITH**[2], J.T. CALLAGHAN[3], P.V. HATTON[3], [1]School of Materials, University of Manchester, UK; [2]BioMedical Research Centre, Sheffield Hallam University, UK; [3]School of Clinical Dentistry, University of Sheffield, UK

Q-3:L09 **Liposome Loaded Chitosan Hydrogels. A Promising Delayed Release Biomaterial and Related Mechanism**
J. DESBRIERES[1], M. POPA[2], C. PEPTU[2], S. BACAITA[3], [1]Université de Pau et des Pays de l'Adour, IPREM (UMR CNRS 5254), Hélioparc Pau Pyrénées, Pau cedex, France; [2]Department of Natural and Synthetic Polymers, "Gheorghe Asachi" Technical University of Iasi, Iasi, Romania; [3]Department of Physics, "Gheorghe Asachi" Technical University of Iasi, Iasi, Romania

Q-3:L10 **Calcium Phosphate Coatings with Therapeutic Drug Release for Prosthetic Devices in Orthopaedics**
R. GADOW[1], **P. KRIEG**[1], I. ARHIRE[1], A. KILLINGER[1], A. BERNSTEIN[2], [1]Institute for Manufacturing Technologies of Ceramic Components and Composites (IMTCCC), University of Stuttgart, Stuttgart, Germany; [2]Musculoskeletal research lab, Department of Surgery, Clinics of Orthopedics and Trauma Surgery, University of Freiburg - Medical Centre, Freiburg, Germany

Q-3:L11 **Study on the Magnetic Fe3O4 with Cyclodextrin Composite for Drug Delivery**
C.L. WANG, Y.H. ZHOU, W.T. LIANG, Y. ZHANG, Y.J. GUO, C. DONG, **S.M. SHUANG**, Department of Chemistry and Chemical Engineering and Institute of Environmental Science, Shanxi University, Taiyuan, P.R. China

Q-3:L12 **Macroporous BaO·6Fe2O3-Based Nanostructured Vehicle for Drug Delivery**
S. TORRES, V.S. LOPEZ, M.E. CONTRERAS, IIMM UMSNH, Morelia, Michoacan, Mexico; A. BRAVO, CMEB UMSNH, Tarimbaro, Michoacán, Mexico

Q-3:L13 **Prodigious Loaded PLGA-based Composites: for Extended Localized Drug Release**
Y. DANYUO[1,2], O. OBERIAFOR[3], J.D. OBAYEMI[1,4], S. DOZIE-NWACHUKWU[1,3], C.J. ANI[5,6], O.S. ODUSANYA[3], M.G. ZEBAZE KANAB[2], K. MALATESTA[7], W.O. SOBOYEJO[1,7,8], [1]Dept. of Materials Science and Eng., African University of Science and Tech. (AUST), Abuja, Federal Capital Territory, Nigeria; [1]Dept. of Materials Science and Eng., Kwara State University, Nigeria; [3]Biotechnology and Genetic Eng. Advanced Lab., Sheda Science and Technology Complex (SHESTCO), Abuja, Federal Capital Territory, Nigeria; [4]Dept. of Materials Science and Eng., Kwara State University, Nigeria; [5]Dept. of Theoretical Physics, African University of Science and Tech. (AUST), Abuja, Federal Capital Territory, Nigeria; [6]Dept. of Physics, Salem University, Lokoja-Ajakuta Road, Kogi, Nigeria; [7]Dept. of Mechanical and Aerospace Eng., Princeton, NJ, USA; [8]Princeton Inst. for the Science and Technology of Materials (PRISM), Princeton, NJ, USA

Session Q-4
Nanomaterials Systems for Bio-imaging and Therapy

Q-4:IL01 **Dynamic Culturing Systems for Cell-seeded Functionalized Implantable Scaffolds**
V. SIKAVITSAS[1,2], C. WILLIAMS[2], A. SIMMONS[1], Z. MUSSETT[2], [1]Schools of Chemical, Biological, and Materials Engineering, [2]Stephenson School of Biomedical Engineering, The University of Oklahoma, Norman, OK, USA

Q-4:IL02 **Interaction of Noble Nanoparticles of Different Morphology with Human Skin and Skin Cells**
C. GRAF, D. NORDMEYER, E. RÜHL, Freie Universität Berlin, Berlin Germany; F. RANCAN, S. AHLBERG, A. VOGT, J. LADEMANN, Charité - Universitätsmedizin, Berlin, Germany; C. SENGSTOCK, M. KÖLLER, Bergmannsheil University Hospital, Bochum, Germany; J. DIENDORF, M. EPPLE, University of Duisburg Essen, Essen, Germany; J. RAABE, Paul Scherrer-Institut, Villigen, Switzerland

Q-4:IL03 **Stealth Liposomes Conferred with Light-triggered Cargo Release for Theranostic Applications**
D. LUO, K.A. CARTER, A. RAZI, J. GENG, S. SHAO, D. GIRALDO, U. SUNAR, J. ORTEGA, **J.F. LOVELL**, University at Buffalo, State University of New York, Buffalo, NY, USA

Q-4:IL04 **15 Years of Commercializing Nanomedicine into Real Medical Products**
T.J. WEBSTER, Department of Chemical Engineering, Northeastern University, Boston, MA, USA, and Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah, Saudi Arabia

Q-4:IL05 **Dendrimer-nanoparticle Conjugates as Efficient Tools for in Vivo Cancer Targeting**
S. BEGIN-COLIN, **D. FELDER-FLESCH**, Institut de Physique et Chimie des Matériaux de Strasbourg, IPCMS UMR CNRS-UdS-ECPM 7504, Strasbourg cedex, France

Q-4:IL06 **Genomic Nanomedicines for Cancer Therapy**
S. SRIDHAR, Northeastern University and Harvard Medical School, Boston, MA, USA

Q-4:L07 **Functional Nanoparticles for Tumor Imaging**
MINGYUAN GAO, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China

Q-4:L08 **Fluorescent Nanoparticles of Silicon and Carbon for Breast Cancer Imaging**
J.S. KANATHASAN, **V. SWAMY**, U.D. PALANISAMY, Monash University Malaysia, Bandar Sunway, Selangor, Malaysia; A.K. RADHAKRISHNAN, International Medical University, Bukit Jalil, Kuala Lumpur, Malaysia

Q-4:IL09 **Centimeter-deep Tissue Fluorescence Microscopy for Biomedical Applications**
BAOHONG YUAN, BINGBING CHENG, University of Texas at Arlington, Department of Bioengineering, Arlington, TX, USA

Q-4:IL10 **Design of Functionalized Iron Oxide Nanoparticles for Theranostics**
D. FELDER-FLESCH, D. MERTZ, **S. BEGIN**, IPCMS UMR CNRS Unistra 7504, Strasbourg Cedex, France

Q-4:IL11 **3D Chiral Nanostructure for High-sensitivity Molecular Imaging with Optical Coherence Tomography**
NANGUANG CHEN, KALPESH MEHTA, PENGFEI ZHANG, Department of Biomedical Engineering, National University of Singapore, Singapore

Q-4:L13 **Ultrasensitive in Vivo Detection of Primary Gastric Tumor and Lymphatic Metastasis Using Upconversion Nanoparticles**
R.R. QIAO[1], C.H. LIU[2], K.C. WU[2], M.Y. GAO[1], [1]Institute of Chemistry, the Chinese Academy of Sciences, Beijing, China; [2]State Key Laboratory of Cancer Biology, Xijing Hospital of Digestive Diseases, Fourth Military Medical University, Xi'an, China

Q-4:L14 **A Protease-activated Ratiometric Fluorescent Probe for pH-mapping of Malignant Tumor**
YI HOU[1], J. ZHOU[1], ZHENYU GAO[2], X.Y. SUN[1], C.Y. LIU[1], D.H. SHANGGUAN[1], W.S. YANG[2], M.Y. GAO[1], [1]Institute of Chemistry, the Chinese Academy of Sciences, Zhong Guan Cun, Beijing, China, [2]College of Chemistry, Jilin University, Changchun, China

Q-4:L15 **Relaxor Single-crystal Plates with Nano Size Ferroelectric Domains Applied to Ultrasonic Probe for Medical Uses**
TOSKIO OGAWA, TAIKI IKEGAYA, Department of Electrical and Electronic Engineering, Shizuoka Institute of Science and Technology, Fukuroi, Japan

Poster Presentations

Q:P01 **Cryochemical Synthesis and Antibacterial Activity of Hybrid Compositions based on Ag and Cu Nanoparticles included in Nanocrystals of Antibiotics**
O.I. VERNAYA[1], D.I. KHVATOV[2], A.N. BORODINA[1], M.A. MARKOV[1], V.P. SHABATIN[1], A.M. SEMENOV[2], T.I. SHABATINA[1], Moscow State University, [1]Chemical Department, [2]Biological Department, Moscow, Russian Federation

Q:P02 **Preparation of Bone-hemostasis Materials with Sugar-containing Hydroxyapatite and Natural Plant-derived Polymer**
YEONJEONG NOH[1], T. UMEDA[1], T. MUSHA[2], K. ITATANI[1], [1]Department of Materials and Life Sciences, Sophia University, Tokyo, Japan; [2]2nd Department of Orthopaedic Surgery, Toho University, Tokyo, Japan

Q:P03 **Antibacterial Property of Chitosan/poly(vinyl alcohol) Blend Nanofibers**
S. HABIBI, M. RAZAGHPOUR, Islamic Azad University, Yadegar e Imam Khomeini(RAH) Shahr-e-Rey Branch, Tehran, Iran

Q:P04 **Sintering and Characterization of Submicron Zirconia-(0-30 vol%) Alumina Composites**
R.E. PRESTES SALEM, E.M.J.A. PALLONE, Sao Paulo University, Pirassununga, SP, Brazil; F.R. MONTEIRO, A.S.A. CHINELATTO, A.L. CHINELATTO, Ponta Grossa State University, Ponta Grossa, PR, Brazil

Q:P05 **Synthesis, Characterization and SERS Activity of Silver Nanoparticles using Hibiscus Cannabinus Flower and Leaf Extracts**
K. THARANI, **L.C. NEHRU**, Department of Medical Physics, Bharathidasan University, Trichirappalli, Tamilnadu, India

Q:P06 **MOF@Activated Carbon: A New Material for Adsorption of Aldicarb in Biologic Systems**
C.A. FERNANDES DE OLIVEIRA, F.F. SILVA, D.M.B. SOUZA, I.A. SOUZA, S.A. JÚNIOR; Universidade Federal de Pernambuco, Recife, Brazil; G.C. JIMENEZ, J.F.S. NETO; Universidade Federal Rural de Pernambuco, Recife, Brazil

Q:P07 **Functionalizing Surface Electrical Potential of Hydroxyapatite Coatings**
L. PLUDUMA, K.A. GROSS, E. FREIMANIS, I. DAENKE, Faculty of Materials Science and Applied Chemistry, Riga Technical University, Latvia; P. VUORISTO, H KOIVULUOTO, Department of Materials Science, Tampere Univeristy of Technology, Finland

Q:P08 **Clinical Investigation and Bio-compatibility Evaluation of Novel Synthetic Bone Graft Substitute, OsvehOss@**
M. STIRI[1], H. KHADIVI AYASK[1], **N. SASANI**[1], M. GOLESTANIPOUR[2], A. MOLOUDI[2], M. ZAREPOUR[1], [1]Osveh Asia Medical Instrument Co., Mashhad, Iran; [2]Materials Research Group, Iranian Academic Center for Education, Culture and Research (ACECR), Mashhad Branch, Iran

Q:P09 **Sol-gel Synthesis of Biocompatible Glasses: A Study of Particle Growth Kinetics using Dynamic Light Scattering**
R. BORGES, **J. MARCHI**, Federal University of ABC, Santo André, Brazil

Q:P10 **Drilling Quantification and Bioactivity of Novel Machinable Hydroxyapatite : Yttrium Phosphate Bioceramic Composite**
R. GHOSH, R. SARKAR, S.K. PAL, Department of Ceramic Engineering, National Institute of Technology, Rourkela, Odisha, India; S. PAUL, Department of Mechanical Engineering, Indian Institute of Technology, Kharagpur, West Bengal, India

Q:P11 **Nanocomposites of PLLA and WS2 Nanotubes for Bioresorbable Vascular Scaffolds**
T. DI LUCCIO, ENEA Centro Ricerche Portici, Portici (NA), Italy and California Institute of Technology, Pasadena, CA, USA; K. RAMACHANDRAN, J.A. KORNFIELD, California Institute of Technology, Pasadena, CA, USA

Q:P12 **Electrospun Gelatin Nanofibrous Scaffolds for Cartilage Tissue Engineering**
Sh. ALIAKBARSHIRAZI, M.A. TALEBIAN, Guilan University, Rasht, Iran Islamic Azad University, Yadegare Imam Khomeini (RAH) Branch, Tehran, Iran

Q:P13 **Synthesis of Mesoporous Magnesium Ferrite (MgFe2O4) using Porous Silica Templates**
M. BAGHERI, M.A. BAHREVAR, Department of Semiconductors, Materials and Energy Research Center (MERC), Karaj, Iran; A. BEITOLLAHI, Ceramic Division, Iran University of Science and Technology (IUST), Tehran, Iran

Q:P14 **Lipid Coated Chitosan Nano- and Microparticles for Pulmonary Application**
A. SOMMERWERK, S.R. PINNAPIREDDY, J. BRÜSSLER, J. SCHÄFER, **U. BAKOWSKY**, Marburg University, Pharmaceutical Technology und Biopharmaceutics, Marburg, Germany

Q:P15 **Investigation on the Cholic Acid Derivative Functionalized Fe3O4 Magnetic Nanoparticles for Drug Delivery**
WENTING LIANG, TAO GONG,CHUAN DONG, SHAOMIN SHUANG, Department of Chemistry and Chemical Engineering and Institute of Environmental Science, Shanxi University, Taiyuan, P.R. China

Q:P16 **Antibacterial Activation of Magnesium doped Hydroxyapatite and Loaded by Ciprofloxacin**
S. ZIANI[1,2], S. MESKI[2], H. KHIREDDINE[2], [1]Département de Pétrochimie et de Génie des Procédés, Faculté de Technologie, Université 20 Aout 1955, Skikda, Algerie; [2]Laboratoire de Génie de l'Environnement (LGE), Faculté de Technologie, Université A.MIRA, Bejaia, Algérie

Q:P17 **Ketorolac Tromethamine Release contained in SBA-15 and CMK-3 Mesoporous Materials**
J.M. JUAREZ, J. CUSSA, M.B. GÓMEZ COSTA, O.A. ANUNZIATA, Centro de Investigación en Nanociencia y Nanotecnología (NANOTEC), Facultad Regional Córdoba, Universidad Tecnológica Nacional, Córdoba, Argentina

Q:P19 **Magnetic Nanocomposite Thermoseeds for Post Operative Treatment of Breast Cancer**
K. KAN-DAPAAH, Dept. of Biomedical Engineering, University of Ghana, Accra, Ghana; N. RAHBAR, D. CROSSON, A. TAHLIL, Dept. of Civil and Env. Eng., Worcester Polytechnic Institute, USA; N. YAO, W. SOBOYEJO, Dept. of Mechanical and Aerospace Eng., Princeton University, USA

Q:P20 **Green Synthesis with Microwave Surface Passivation of Carbon Quantum Dots from Citrus Microcarpa Bunge Peels**
P.A.N. DE YRO, M.A. CHUA II, B.T. SALON, Materials Science Division, Industrial Technology Development Institute, Department of Science and Technology, Bicutan, Taguig City, Philippines; School of Graduate Studies, Mapúa Institute of Technology, Muralla St, Intramuros, Manila, Philippines

Q:P21 **Use of Nanodiamonds Platforms to Evaluate Gamma Irradiated Red Blood Cells**
M. ACOSTA-ELIAS[1], A. ANGULO-MOLINA[1], A. SARABIA-SAINZ[1], E. SILVA-CAMPA[1], A. BURGARA-ESTRELLA[1], B. CASTANEDA[2], K. SANTACRUZ-GOMEZ[2], R. MELENDREZ[1], M. BARBOZA-FLORES[1], D. SOTO-PUEBLA[1], S. ALVAREZ-GARCÍA[1], **M. PEDROZA-MONTERO**[1], [1]Departamento de Investigación en Física, Universidad de Sonora, México; [2]Departamento de Física, Universidad de Sonora, México

Q:P22 **Photobactericidal Activity of FeFe2O4&Au0 Core & Shell Nanocomposite**
O.M. LAVRYNENKO, Y.S. SHCHUKIN, G.A. DOLYNSKYI, F.D. Ovcharenko Institute of Bio-Colloid Chemistry, Kyiv, Ukraine; R.E. KAVETSKY, Institute of Experimental Pathology, Oncology and Radiobiology, National Ukrainian Academy of Sciences, Kyiv, Ukraine

Q:P23 **Magnetic Properties and Relaxivities of Stabilized Colloidal Solutions of Mg-Zn Ferrite as Potential Contrasting Agents for Magnetic Resonance Imaging**
V. PANKOV[1], E. PETROVA[1], D. KOTSIKAU[1], V. NATAROV[1], T. SHUTAVA[2], [1]Belarusian State University, Minsk, Belarus; [2]The Institute of Chemistry of New Materials of the National Academy of Sciences of Belarus, Belarus

Focused Session Q-5

BIOMEDICAL APPLICATIONS OF CARBON NANOTUBES AND GRAPHENE: OPPORTUNITIES AND CHALLENGES

Oral Presentations

Q-5:IL01 **Graphene in Biomedical Applications**
A. ZURUTUZA, Graphenea S.A., Donostia - San Sebastian, Spain

Q-5:IL02 **Multifunctional Carbon Nanotubes for Anticancer Therapy**
C. MENARD-MOYON, L. MUZI, A. BIANCO, CNRS, Institut de Biologie Moléculaire et Cellulaire, Laboratoire d'Immunopathologie et Chimie Thérapeutique, UPR 3572, Strasbourg, France; I. MARANGON, F. GAZEAU, Laboratoire Matière et Systèmes Complexes, UMR 7057 CNRS-Université Paris-Diderot, Paris, France; G. PASTORIN, Department of Pharmacy, National University of Singapore, Singapore

Q-5:IL03 **Graphene Water Dispersions! Preparation and Applications**
E. VAZQUEZ, Universidad de Castilla-La Mancha, Ciudad Real, Spain

Q-5:IL04 **Light Weight and Flexible High-performance Sensor Platforms for Medical Diagnostics**
M. MEYER[1], L. BARABAN[1], F. PUMP[1,2], **G. CUNIBERTI**[1,2,3], [1]Institute for Materials Science, TU Dresden, Germany; [2]Dresden Center Computational Materials Science, TU Dresden, Germany; [3]Center for Advancing Electronics Dresden (cfaed), TU Dresden, Germany

Q-5:IL05 **Immunosensor based on Carbon Nanotubes and Graphene**
M. HOLZINGER, Département de Chimie Moléculaire, University of Grenoble-Alpes, Grenoble, France

Q-5:IL06 **Towards NanoMRI with Mechanical Resonators based on Nanotubes and Graphene**
A. BACHTOLD, ICFO - The Institute of Photonic Sciences, Castelldefels (Barcelona), Spain

Q-5:IL07 **Graphene-based Optoelectronic Liquid Sensing Platform**
M. STEINER[1], M. ENGEL[2], R. GIRO[1], P.W. BRYANT[1], R.F. NEUMANN[1], P. AVOURIS[2], C. FEGER[2], [1]IBM Research, Rio de Janeiro, Brazil; [2]IBM Research, Yorktown Heights, NY, USA

Q-5:IL08 **Graphene Interfaced with Bio-components: Sensors, Wraps, Wrinkles and Flap-valves**
V. BERRY, Department of Chemical Engineering, University of Illinois at Chicago, Chicago, IL, USA

Q-5:L09 **Graphene and Graphene Oxide Sensors for Monitoring Chronic Wounds**
N. CALISI, B. MELAI, P. SALVO, C. PAOLETTI, R. FUOCO, V. MOLLICA, **F. DI FRANCESCO**, Department of Chemistry and Industrial Chemistry, University of Pisa, Pisa, Italy

Q-5:IL10 **Carbon Nanohorns for Targeted Therapy**
EIJIRO MIYAKO, Nanomaterial Research Institute (NMRI), National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

Q-5:IL11 **Carbon-based Substrates for Stem Cell Differentiation**
T. NAYAK, C. ZHAO, H. ANDERSEN, H.K. HO, B. OEZYILMAZ, **G. PASTORIN**, National University of Singapore, Pharmacy Department, Singapore

Q-5:IL12 **Anodic-electrophoretic Deposited Graphene Oxide onto Anodized Titanium for Orthopaedic Applications**
S. SIRIVISOOT, Biological Engineering Program, Faculty of Engineering, King Mongkut's University of Technology Thonburi, Bangkok, Thailand

Q-5:IL13 **Fate of Functionalized Carbon Nanotubes In the Brain: From the in Vitro Interactions to the in Vivo Response**
C. BUSSY, Centre for Tissue Injury and Repair, Faculty of Biology, Medicine and Health & National Graphene Institute, University of Manchester, Manchester, UK

Q-5:IL14 **Graphene in Medicine: Immune Cell Interactions**
L.G. DELOGU, Department of Chemistry and Pharmacy, University of Sassari, Sassari, Italy

Q-5:IL15 **Risk of Altered Respiratory Immunity Associated with Exposure to Carbonaceous Nanomaterials**
A.A. SHVEDOVA, CDC/NIOSH and Dept. Physiology & Pharmacology, WVU, Morgantown, WV, USA; V.E. KAGAN, University of Pittsburgh, Pittsburgh, PA, USA

Focused Session Q-6

MATERIALS NANOTECHNOLOGIES FOR IMPLANTABLE NEURAL INTERFACES

Oral Presentations

Q-6:IL01 **Semiconductor Nanowires for Neural Interface Applications**
C.N. PRINZ, Division of Solid State Physics, NanoLund and Neuronano Research Center, Lund University, Lund, Sweden

Q-6:IL02 **Carbon Nanotube Technology for Flexible Neuronal Interfacing**
Y. HANEIN, School of Electrical Engineering, Tel Aviv University, Tel Aviv, Israel

Q-6:IL03 **Biomimetic Surface Modifications for a Seamless and Stable Neural Electrode-tissue Interface**
X. TRACY CUI, University of Pittsburgh, Pittsburgh, PA, USA

Q-6:IL05 **Tissue Engineering Conducting Polymer Coatings for Implantable Neural Interfaces**
R. GREEN, Biomedical Engineering, UNSW, Sydney, Australia

Q-6:L06 **A Direct Comparison of Glassy Carbon and PEDOT-PSS for High Charge Injection and Low Impedance Neural Interfaces**
M. VOMERO[1], E. CASTAGNOLA[2], S. DE FAVERI[2], E. MAGGIOLINI[2], I. REMBADO[2], L. FADIGA[2,3], S. KASSEGNE[1], D. RICCI[2], [1]MEMS Research Lab., Department of Mechanical Engineering, College of Engineering, San Diego State University, San Diego, CA, USA; [2]CTNS@UniFe, Istituto Italiano di Tecnologia, Ferrara, Italy; [3]Section of Human Physiology, University of Ferrara, Ferrara, Italy

Q-6:L07 **Nanostructured Diamond for the Attachment and Proliferation of Human Stem Cells and Functional Neural Networks**
A. TAYLOR[1], B. VAGASKA[2], R. EDGINGTON[1], P. FERRETTI[2], C. HEBERT[3], G. PIRET[3], P. BERGONZO[3], **R. JACKMAN**[1], [1]London Centre for Nanotechnology and Department of Electronic and Electrical Engineering, University College London, London, UK; [2]Institute of Child Health, University College London, London, UK; [3]Diamond Sensors Group, CEA-LIST, Saclay, France

Q-6:L08 **Investigation of HfO2-based Capacitive Transducers for Neuron Interfacing**
G. TALLARIDA[1], S. SPIGA[1], A. CORNA[2], L. GELMI[1], A. LAMPERTI[1], M. FANCIULLI[1,2], [1]Laboratorio MDM - CNR-IMM, Agrate Brianza, Italy; [2]Dipartimento di Scienza dei Materiali, Università degli Studi di Milano Bicocca, Milano, Italy

Q-6:L09 **Ti/HAP Biocomposite Coatings Synthesised by Means of Laser Metal Deposition Technique**
M. TLOTLENG, Department of Mechanical Engineering Science, University of Johannesburg, Auckland Park Campus, Johannesburg, South Africa, and Laser Materials Processing Group, National Laser Center, Council for Scientific and Industrial Research, Pretoria, South Africa

Q-6:IL10 **Stretchable Hydrogel Bioelectronics: From 3D Printing to Neural Applications**
XUANHE ZHAO, Soft Active Materials Laboratory, MIT, Cambridge, MA, USA

Q-6:L11 **Novel Bioceramics and Composite Structures for Intelligent Neuroimplantation**
R. GADOW[1], F. KERN[1], A. KILLINGER[1], A. GHARABAGHI[2], [1]Institute for Manufacturing Technologies of Ceramic Components and Composites (IMTCCC), University of Stuttgart, Stuttgart, Germany; [2]Klinik für Neurochirurgie, Universitätsklinikum Tübingen, Tübingen, Germany

Q-6:L12 **Soft and Leaky Encapsulation Materials for Neural Interface Devices**
A. JOSHI-IMRE, A. GARCIA SANDOVAL, R. MODI, S. COGAN, W. VOIT, The University of Texas at Dallas, Richardson, TX, USA

Q-6:L13 **3D Diamond Electrode Arrays for In-vivo Neural Networks Interfacing**
C. HÉBERT, E. SCORSONE, **P. BERGONZO**, CEA LIST, Diamond Sensors Laboratory, Gif-sur-Yvette, France; L. ROUSSEAU, M. COTTANCE, G. LISSORGUES, ESIEE-Paris, ESYCOM University Paris-EST, Cité Descartes, Noisy le Grand Cedex, France; A. BENDALI, A. SBARTAI, S. PICAUD, INSERM, U968 Institut de la vision Paris, France; G. PIRET, B. YVERT, INSERM, UA01, Clinatec lab, Biomedical Research Center E J. Safra, Grenoble, France; J.-P. MAZELLIER, Thales Research and Technology, Palaiseau, France; F. SAUTER-STARACE, CEA/LETI, MINATEC Campus, CLINATEC, Grenoble, France; A. TAYLOR, R.B. JACKMAN, London Centre for Nanotechnology, University College London, London, UK

Q-6:IL15 **Systemic Inhibition of Innate Immunity Pathways Improves Intracortical Microelectrode Performance**
J.R. CAPADONA, J.K. HERMANN, M. RAVIKUMAR, Department of Biomedical Engineering, Case Western Reserve University, Cleveland, OH, USA; Advanced Platform Technology Center, L. Stokes Cleveland VA Medical Center, USA

Q-6:L16 **Recording High Frequency Neural Signals using Conformable and Low-impedance ECoG Electrodes Arrays coated with PEDOT-PSS-PEG**
E. CASTAGNOLA[1], M. MARRANI[2], E. MAGGIOLINI[1], S. DE FAVERI[1], F. MAITA[2], L. PAZZINI[2], D. POLESE[2], A. PECORA[2], L. MAIOLO[2], L. FADIGA[1,3], D. RICCI[1], [1]CTNS@UniFe, Istituto Italiano di Tecnologia, Ferrara, Italy; [2]CNR-IMM Istituto per la Microelettronica e i Microsistemi, Rome, Italy; [3]Section of Human Physiology, University of Ferrara, Ferrara, Italy

Q-6:L17 **Interface Investigation of Electrogenic Cells on 3D Laser-patterned PEDOT Structures**
F. SANTORO[1], G.C. FARIA[2,3], Y. VAN DE BURGT[2], A. SALLEO[2], B. CUI[1], [1]Department of Chemistry, Stanford University, Stanford, CA, USA; [2]Department of Material Science and Engineering, Stanford University, Stanford, CA, USA; [3]Sao Carlos Physics Institute, Sao Paulo University, Sao Carlos, Brazil

Q-6:L18 **A Nanoscale Interface Directs Alignment of a Cell-assembled Extracellular Matrix to Template Neurite Outgrowth**
J. SCHWARTZ[1], S.B. BANDINI[1], G.M. HARRIS[2], L.S.F. ADLER[1], A.O. PARIKH[1], J. SPECHLER[3], C.B. ARNOLD[3], H. WANG[4], J.E. SCHWARZBAUER[2], [1]Department of Chemistry, Princeton University, Princeton, NJ, USA; [2]Department of Molecular Biology, Princeton University, Princeton, NJ, USA; [3]Department of Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ, USA; [4]Department of Neurologic Surgery, Mayo Clinic, Rochester, MN, USA

Q-6:IL19 **Narrowing the Physical Mismatch between Neural Implants and Neural Tissues**
S.P. LACOUR, Laboratory for Soft Bioelectronics Interfaces, Centre for Neuroprosthetics, School of Engineering, EPFL, Lausanne, Switzerland

Q-6:IL20 **Ultracompliant Electrodes for Next-generation Brain-machine Interfaces**
C.J. BETTINGER, Carnegie Mellon University, Pittsburgh, PA, USA

Q-6:IL21 **Combined Strategies to Aid Nerve Repair**
S. THOMSON[1], F. GESELLCHEN[1], T. DEJARDIN[1], C. MARTIN[1], A. HART[1], A. BERNASSAU[2], P. KINGHAM[3], D. CUMMING[1], **M. RIEHLE**[1], [1]University of Glasgow, Glasgow, UK; [2]Herriot Watt University, Edinburgh, UK; [3]University of Umeå, Sweden

Q-6:IL22 **Organic Electronics for Interfacing with the Brain**
G. MALLIARAS, Ecole des Mines, Gardanne, France

Q-6:IL23 **SiC-based Neural Interfaces for the Central Nervous System**
C.L. FREWIN, **S.E. SADDOW**, University of South Florida, Tampa, FL, USA

Poster Presentations

Q-6:P01 **pHEMA Hydrogel Encapsulation of High-Selectivity-Micro-EcoG-Arrays for In-vivo Recording**
E. MAGGIOLINI[1], E. CASTAGNOLA[1], S. DE FAVERI[1], D. RICCI[1], L. FADIGA[1,2], [1]CTNS@UniFe, Istituto Italiano di Tecnologia, Ferrara, Italy; [2]Section of Human Physiology, University of Ferrara, Ferrara, Italy

Q-6:P02 **Biologically Integrated and Soft Neural Interfaces: A Progress toward the Long Term Acceptance of Microelectrodes by the Organism**
S. DE FAVERI[1], E. CASTAGNOLA[1], E. MAGGIOLINI[1], L. CESERACCIU[2], F. BENFENATI[3], D. RICCI[1], L. FADIGA[1,4], [1]CTNS@UniFe,Istituto Italiano di Tecnologia, Ferrara, Italy; [2]Smart Materials, Istituto Italiano di Tecnologia, Genova, Italy; [3]IIT@CBA, Genova, Italy; [4] Section of Human Physiology, University of Ferrara, Ferrara, Italy