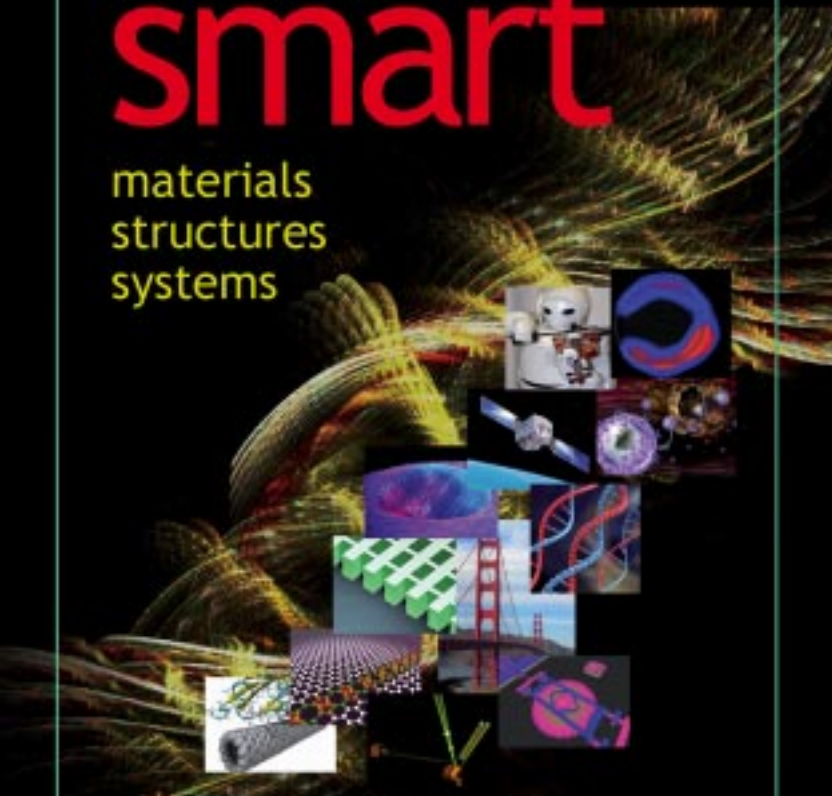
Sessions by Day

4th International Conference

smart

materials
structures
systems



Montecatini Terme, Italy • June 10-14, **2012**

CIMTEC
2012

4th International Conference

smart materials structures systems

"PALAZZO DEI CONGRESSI"

Via Amendola, 2

Symposium A
Adaptive, Active & Multifunctional Smart Materials Systems

Symposium C
Electroactive Polymers: Advances in Materials & Devices

Symposium D
Smart & Interactive Textiles

Symposium E
Next Generation Micro/Nano Systems

Symposium F
Smart & Adaptive Optics

Symposium G
Emboding Intelligence in Structures & Integrated Systems

"VITTORIA CONGRESSI"

Via Baccelli, 2

Symposium B
State-of-the-art Research & Application of SMAs Technologies

Symposium H
Mining Smartness from Nature

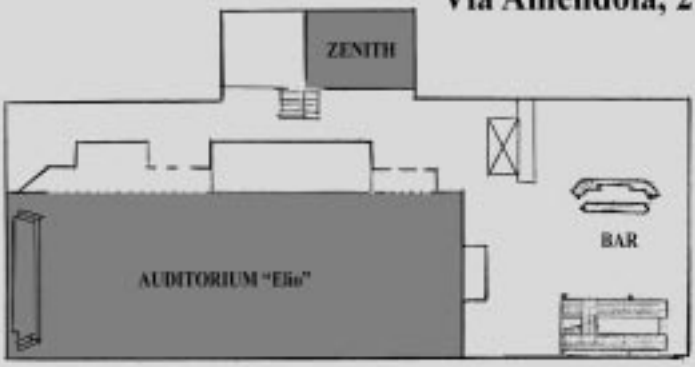
Symposium I
Progress in Wearable/ Wireless and Implantable Body Sensor Networks for Healthcare Applications

Symposium J
Biomedical Applications of "Smart" Technologies

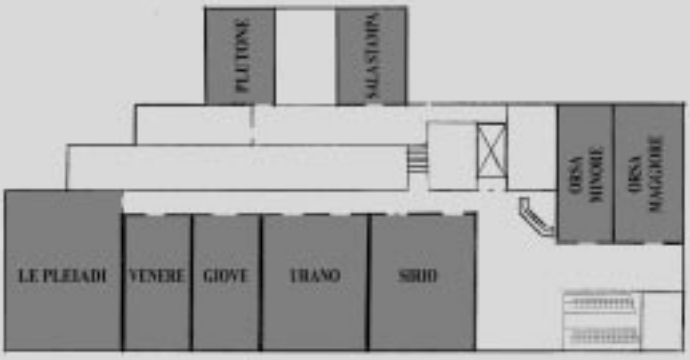
INDEX

PALAZZO DEI CONGRESSI

Via Amendola, 2



2nd FLOOR



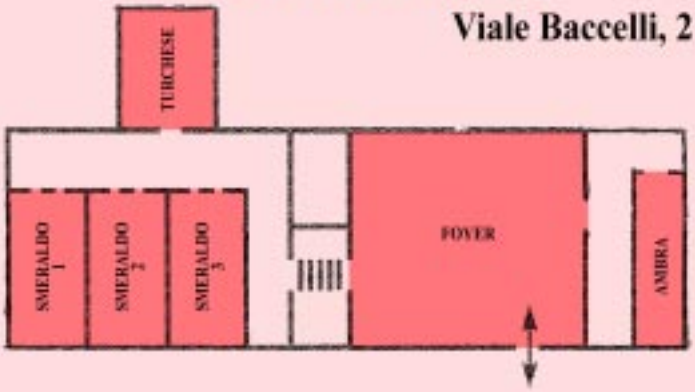
1st FLOOR

GROUND FLOOR

VITTORIA CONGRESSI

Congress Centre Hotel Vittoria

Viale Baccelli, 2



Symposia held at
“PALAZZO DEI CONGRESSI”

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Symposium A
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Viale Baccelli 2

4 min walking distance from the “Palazzo dei Congressi”

Symposium B
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Symposium J
Biomedical Applications of “Smart” Technologies

CONFERENCE OUTLINE

SYMPOSIUM A

Adaptive, Active & Multifunctional Smart Materials Systems

Special Session ***A-10***
Emerging Non-volatile Memory Devices

Focused Session ***A-11***
Multiferroics

Focused Session ***A-12***
Progress in Metamaterials Research

Focused Session ***A-13***
Graphene: From Science to Technology

Special Session ***A-14***
Multifunctional Smart Materials for Energy Harvesting

Focused Session ***A-15***
Actively Moving Polymers

SYMPOSIUM B

State-of-the-art Research & Application of SMAs Technologies

SYMPOSIUM C

Electroactive Polymers: Advances in Materials & Devices

SYMPOSIUM D

Smart & Interactive Textiles

SYMPOSIUM E

Next Generation
Micro/Nano Systems

SYMPOSIUM F

Smart & Adaptive
Optics

SYMPOSIUM G

Emboding Intelligence in
Structures & Integrated Systems

Special Session ***G-6***

Advances and Challenges in the SHM of Civil and Aerospace Structures

SYMPOSIUM H

Mining Smartness
from Nature

Special Session ***H-7***

Biomimetic Flow Control in Aquatic and Aerial Systems and its Application to Bioinspired Autonomous Vehicles

SYMPOSIUM I

Progress in Wearable/Wireless and
Implantable Body Sensor Networks for
Healthcare Applications

SYMPOSIUM J

Biomedical Applications of
“Smart” Technologies

Meeting Rooms

PALAZZO DEI CONGRESSI

OPENING SESSION ..... AUDITORIUM

Symposium A ..... AUDITORIUM
..... VENERE
..... GIOVE

Special Session A-10 ..... PLUTONE

Focused Session A-11 ..... ZENITH

Focused Session A-12 ..... ORSA MAGGIORE

Focused Session A-13 ..... ORSA MINORE

Special Session A-14 ..... ZENITH

Focused Session A-15 ..... VENERE
..... SIRIO
..... URANO

Symposium C ..... URANO
..... ALBA 2

Symposium D ..... ALBA 2

Symposium E ..... SIRIO

Symposium F ..... GIOVE

Symposium G ..... LE PLEIADI

Special Session G-6 ..... LE PLEIADI

VITTORIA CONGRESSI

Symposium B ..... SMERALDO 1
..... TURCHESE

Symposium H ..... SMERALDO 2
..... TURCHESE

Focused Session H-7 ..... AMBRA

Symposium I ..... TURCHESE

Symposium J ..... SMERALDO 3

Events by Day

Sunday June 10

11.00-13.00 15.00-19.00

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

15.00-19.00
POSTER MOUNTING

Monday June 11

Morning: 10.15-13.00

Opening Session
Welcome Address

Plenary Lectures (PL1-PL3)

8.30-13.00
POSTER MOUNTING

Monday June 11

Afternoon: 14.55-19.30

Symposium A	(A-6.1:IL01-IL05) (A-6.1:IL06-L09)
	(A-12.1:IL01-L05) (A-12.1:IL06-L09)
	(A-13:KL; A-13.5:IL01-L03) (A-13.1:IL02-L04)
	(A-14.1:IL01-L09)
	(A-15.1:IL01-IL04) (A-15.1:L06-L09)
Symposium B	(B-1:IL01-IL03) (B-2:IL01-IL04)
Symposium C	(C:KL; C-1:IL01-IL02) (C-1:IL04-L06)
Symposium D	(D-1:IL01-IL06) (D-1:IL07-L09)
Symposium E	(E-9:IL01-IL02) (E-1:IL01-IL04)
Symposium F	(F-1:IL01-IL05) (F-1:IL06-L08)
Symposium G	(G-1:IL01-IL04) (G-1:IL05-IL07) (G-5:IL02)
Symposium H	(H:KL; H-1:IL01-IL06) (H-4:IL05)
Symposium I	(I-1:IL01-L04) (I-2:IL01-L04)
Symposium J	(J-1:IL01-IL03) (J-1:IL04-IL05)

15.00-19.00
POSTER MOUNTING

21.30-23.30
Opening Concert
Teatro Verdi

Tuesday June 12

Morning: 8.30-13.00

Symposium A	(A-1.1:IL01-IL04) (A-1.1:L05-L10) (A-6.1:IL11-IL12) (A-6.2:L02-L06)
	(A-10:IL01-L04) (A-10:IL05-IL09)
	(A-12.2:IL01-L07)
	(A-13.1:IL06-L10) (A-13.2:IL01-IL03)
	(A-14.1:IL11-L15) (A-14.2:IL01-L04)
Symposium B	(B-1:IL05-L08) (B-2:IL05-IL08)
Symposium C	(C-1:IL08-L12) (C-1:IL13-L16; C-1:IL03)
Symposium D	(D-1:IL10-IL13) (D-2:IL01-L05)
Symposium E	(E-2:IL04-L08) (E-5:IL01-IL03) (E-8:IL03)
Symposium F	(F-1:IL09-L12) (F-2:IL01-L05)
Symposium G	(G-2:IL01-IL04) (G-2:IL05-L09)
Symposium H	(H-1:IL07-IL09) (H-2.1:IL01-L16) (H-7:IL01-IL03)
Symposium I	(I-1:IL05-L08) (I-2:IL05-IL06)
Symposium J	(J-1:IL06-IL09) (J-2:IL01-IL04)

Tuesday June 12

Afternoon: 15.00-19.30

Symposium A	(A-1.1:IL11-IL12) (A-1.1:IL13-L23) (A-6.2:IL07-L12) (A-6.1:L13-L15) (A-7:IL01)
	(A-12.2:IL09-L12) (A-12.4:IL02-L04)
	(A-13.2:IL04-L07)
	(A-14.2:IL06-L12) (A-14.3:IL01-L02) (A-14.1:L03)
	(A-15.2:IL01-L05) (A-15.5:IL01-L04)
Symposium B	(B-2:IL09-L12) (B-3:IL01-IL05)
Symposium C	(C-2:IL01-IL07)
Symposium D	(D-1:L14-L16) (D-2:IL06-L10)
Symposium F	(F-2:IL06-L11) (F-3:IL02-L04)
Symposium G	(G-1:L10-L12) (G-3:L13-L18) (G-4:IL02-IL07)
Symposium H	(H-2.1:IL04-IL07) (H-2.1:IL07b-IL10)
	(H-7:IL09-IL11) (H-7:L12-L16)
Symposium I	(I-3:KL; I-3:IL01-IL02) (I-3:IL03-IL04)
Symposium J	(J-2:L06-L07) (J-3:IL01-IL04)

Wednesday June 13

Morning: 8.30-13.00

Symposium A	(A-1.1:IL16-IL18) (A-2:IL01-L05) (A-4:IL02-L07) (A-6.1:IL19-L22)
	(A-10:IL11-IL13) (A-10:IL15-IL16)
	(A-11.1:IL01-IL04) (A-11.1:IL07-L09)
	(A-12.1:L10-L12) (A-12.3:IL01-L06)
	(A-13.2:IL08-IL10) (A-13.3:IL02-L04)
	(A-15.3:IL01-L06) (A-15.4:IL01-L04)
Symposium B	(B-3:IL06-IL09) (B-4:IL01-IL02) (B-5:IL01-IL02)
Symposium D	(D-3:IL01-L05) (D-3:IL06-L10)
Symposium E	(E-2:IL01-IL03) (E-4:IL01-L06) (E-6:IL05)
Symposium F	(F-4:IL01-IL04) (F-4:IL05-L07) (F-7:IL03)
Symposium G	(G-3:IL01-IL04 + L21) (G-3:IL05-IL07) (G-4:IL01)
Symposium H	(H-3:IL02-IL04) (H-4:IL01-L04)
	(H-7:IL05-L08)
Symposium I	(I-4:IL01-IL03) (I-4:IL04-L07)
Symposium J	(J-3:IL07-L11) (J-4:IL01-L05)

Wednesday June 13

Afternoon: 15.00-19.30

Symposium A	(A-1.2:IL02-L04) (A-1.2:IL05-IL06) (A-2:IL06-IL15) (A-5.1:IL01-L04) (A-5.2:IL01-IL03)
	(A-11.2:IL01-L05)
	(A-12.4:IL05-L10)
	(A-13.3:IL06-L09)
Symposium B	(B-1:L09-L13) (B-2:L13-L18) (B-5:IL03-L06)
Symposium C	(C-3:IL01-L04) (C-3:IL05-L09)
Symposium D	(D-3:IL11-L14) (D-3:L15-IL17)
Symposium E	(E-3:IL01-L03) (E-6:IL01-IL04)
Symposium G	(G-3:IL09-IL12) (G-6:IL01-L05)
Symposium H	(H-2.2:IL01-L06) (H-3:L06-L11) (H-5:IL01-IL03)
Symposium J	(J-4:IL06-L09) (J-5:IL02-L03)

21.30-23.30 *Concert by "Caffé Concerto Strauss"*
Palazzo dei Congressi - Auditorium

Thursday June 14

Morning: 9.00-13.00

Symposium A	(A-7:IL02-L05) (A-7:IL06-L10) (A-8:IL01-IL04) (A-8:IL05-L08)
	(A-11.3:IL01-IL04) (A-11.4:IL01-L04)
	(A-12.5:IL01-IL03) (A-12.6:IL02-L04)
	(A-13.3:IL10-L13) (A-13.4:IL01-L03)
	(A-15.6:IL01-IL04) (A-15.6:L05-L07) (A-15.7:L03)
Symposium B	(B-6:IL01-IL04) (B-6:L06-L09)
Symposium D	(D-3:IL21-L24) (D-3:L25-IL27)
Symposium E	(E-7:IL01-L04) (E-7:L05-L09) (E-8:IL02-IL04)
Symposium F	(F-6:IL01-IL03) (F-7:IL01-IL04)
Symposium G	(G-5:IL01-IL05) (G-5:IL07-L09)
Symposium H	(H-4:IL06-IL08) (H-4:IL09-L12)
Symposium I	(I-4:IL09) (I-5:IL01-IL03) (I-5:L04-IL05)
Symposium J	(J-5:IL04-IL09) (J-5:IL10-L13)

Thursday June 14

Afternoon: 15.00-19.30

Symposium A	(A-3:IL01-L03) (A-5.2:IL06-L08) (A-11.5:IL01-L03) (A-12.6:IL05-L08) (A-15.7:IL01-L08)
Symposium B	(B-2:L19-L24) (B-3:L10-L14) (B-3:L15-L19)
Symposium C	(C-2:IL10-L13) (C-4:IL01-IL02)
Symposium F	(F-5:IL01-IL03) (F-7:IL05-IL06)
Symposium G	(G-6:IL06-L09) (G-6:L10-L13)
Symposium H	(H-6:IL01-L04)
Symposium J	(J-6:IL01-L04)

18.30-19.45

POSTER DISCUSSION

21.00-23.30

Conference Dinner

Lidò Le Panteraie

SESSIONS FLOWSHEET

June 10-14

4th International Conference

Smart Materials, Structures, Systems

Chair

Pietro Vincenzini
World Academy of Ceramics
National Research Council, Italy

Programme Chairs

Symposium A: **Salvatore Iannotta**, Italy

Special Session A-10: **Shashi Paul**, UK

Focused Session A-11: **Gopalan Srinivasan**, USA

Focused Session A-12: **Concita Sibilia**, Italy

Focused Session A-13: **Vincenzo Palermo**, Italy

Special Session A-14: **Yoon-Bong Hahn**, Korea / **S.R.P. Silva**, UK

Focused Session A-15: **Andreas Lendlein**, Germany

Symposium B: **Stefano Besseghini**, Italy

Symposium C: **Steen Skaarup**, Denmark

Symposium D: **Cosimo Carfagna**, Italy

Symposium E: **Leandro Lorenzelli**, Italy

Symposium F: **Giancarlo Righini**, Italy

Symposium G: **Fabio Casciati**, Italy

Special Session G-6: **Piervincenzo Rizzo**, USA

Symposium H: **Nadrian C. Seeman**, USA /
Friedrich Simmel, Germany

Special Session H-7: **Luca Schenato**, Italy

Symposium I: **Dermot Diamond**, Ireland

Symposium J: **E. Pasquale Scilingo**, Italy

OPENING SESSION

AUDITORIUM

Chair:
Vijay VARADAN, USA

10.15 - 10.30
Welcome Address

Plenary Lectures

10.30 - 13.00

PL-1

Report on the 2011 off the Pacific Coast Tohoku Earthquake: Its Impact and Control/Monitoring Performances

A. NISHITANI
Waseda University, Tokyo, Japan

PL-2

MEMS Sensors and Actuators: From Actual Market Explosion to New Frontiers

B. MURARI
ST Microelectronics, Agrate Brianza, Italy

PL-3

DNA: Not Merely the Secret of Life

N.C. SEEMAN
Department of Chemistry, New York University, New York, NY, USA

Session A-6.1 - Multifunctional Materials, Hybrids and Nanocomposites

Room: **AUDITORIUM**

Chair: Salvatore IANNOTTA, Italy *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *A-6.1:IL01* **Bottum up Strategies to Nanostructured and Hierarchically Structured Functional Solids**
C. SANCHEZ, Laboratoire de Chimie de la Matière Condensée de Paris, CNRS, Université Pierre et Marie Curie, Collège de France, Paris, France

15.30 *A-6.1:L03* **Sol-gel Derived Multifunctional Layered Hybrid Films for Anti-corrosive Coating**
C. URATA, D.F. CHENG, A. HOZUMI, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan

15.50 *A-6.1:IL05* **Smart Morphology Control of Metal Oxide Nano/ Micro-crystals in Aqueous Solution**
Y. MASUDA, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan

16.20 *Break*

Chair: Clement SANCHEZ, France

16.50 *A-6.1:IL06* **Polymer Nanocomposites for Functional Applications**
F. FAUPEL, V. ZAPOROJTCHENKO, T. STRUNSKUS, Christian-Albrechts University at Kiel, Institute for Materials Science - Multicomponent Materials, Kiel, Germany; M. ELBAHRI, Christian-Albrechts University at Kiel, Institute for Materials Science - Nanochemistry and Nanoengineering, Kiel, Germany and Institute of Polymer Research, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany

17.20 *A-6.1:L08* **New Silver Chloride - Silver Hybrid Polymers with Nylon and Polyurethane Showing Enhanced Antimicrobial and Photocatalytic Properties**
M. PARRY, J.H. JOHNSTON, School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand

17.40 *A-6.1:L09* **Fabrication of Carbon Nanotube-alumina Composite and Coating with Graphite Film**
M. OMORI, G. YAMAMOTO, K. SHIRASU, T. HASHIDA, Graduate School of Mechanical Engineering, Tohoku University, Sendai, Japan

Session A-12.1 - Microwave & THz Metamaterials

Room: **ORSA MAGGIORE**

Chair: Concita SIBILIA, Italy *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *A-12.1:IL01* **Terahertz Metamaterial Response at High Fields**
R.D. AVERITT, Department of Physics, Boston University, Boston, MA, USA

15.30 *A-12.1:IL02* **Analytical Modelling of Microwave/Millimeter Wave 1D and 2D Gratings and Fishnets**
F. MEDINA, Dept. of Electronics and Electromagnetism, University of Seville, Seville, Spain; F. MESA, R. RODRIGUEZ-BERRAL, Dept. of Applied Physics 1, University of Seville, Seville, Spain

16.00 *A-12.1:L03* **On the Lateral Confinement of Surface Waves in the Microwave Regime**
E.M.G. BROCK, E. HENDRY, A.P. HIBBINS, Electromagnetic Materials Group, Physics Building, University of Exeter, Exeter, England

16.20 *A-12.1:L04* **Design and Optimization of Microwave Triangular Meta-material Resonators in Coplanar Configuration**
R. MARCELLI[1], E. PROIETTI[1], G BARTOLUCCI[1, 2], A. LUCIBELLO[1,2], G. DE ANGELIS[1, 2], G. MUZI[3], J. SOLYMOSI[4]; [1]CNR-IMM Roma, Italy; [2]University of Roma "Tor Vergata", Dept. of Electronic Engineering, Italy; [3]VMC Engineering, Rieti, Italy; [4]Bohn Electronic Ltd, Budapest, Hungary

16.40 *A-12.1:L05* **Electromagnetic Shielding using Nanoparticles Embedded in Polymer Matrix Composites**
N. MORA[1], F. RACHIDI, Swiss Federal Institute of Technology-EPFL, Lausanne Switzerland; M. DADRAS, Centre Suisse d'Électronique et de Microtechnique - CSEM, Neuchâtel, Switzerland

17.00 *Break*

Chair: Richard AVERITT, USA

17.30 *A-12.1:IL06* **Enhanced Microwave Transmission at Microwave Frequencies through Omega Particles**
F. BILOTTI, L. DI PALMA, D. RAMACCIA, A. TOSCANO, "Roma Tre" University, Rome, Italy; D. ATES, E. OZBAY, Bilkent University, Turkey

18.00 *A-12.1:IL07* **Bulk Millimeter Wave and Terahertz Metamaterial Design**
M. BERUETE, Millimeter and Terahertz Waves Laboratory, Public University of Navarre, Pamplona, Spain

18.30 *A-12.1:L08* **Surface Wave Resonances Supported on a Square Array of Square Metallic Pillars**
S.J. BERRY[1], A.P. HIBBINS[1], T. CAMPBELL[2], J.R. SAMBLES[1], [1]Electromagnetic Materials Group, Physics Building, University of Exeter, Exeter, England; [2]BAE Systems, Warton Aerodrome, Warton, Preston, England

18.50 *A-12.1:L09* **Influence of Dielectric Loss and Permittivity Variation on Metamaterial Performance**
P. CLEM[1], M.P. RYE[1], **EUNG SOO KIM**[2], CHANG JUN JEON[2], [1]Sandia National Laboratories, Albuquerque, NM, USA; [2]Kyonggi University, Suwon, Korea

Focused Session A-13 - Graphene: from Science to Technology

(Endorsed by European Science Foundation)

Room: **ORSA MINORE**

Chair: Vincenzo PALERMO, Italy *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *A-13:KL* **Graphene-based and Graphene-derived Materials**
R. RUOFF, Cockrell Family Regents Chair, The University of Texas at Austin, USA; **L. COLOMBO**, Texas Instruments, Dallas, USA

Session A-13.5 - Graphene Composites

15.40 *A-13.5:IL01* **The Potential of Graphene Composites: Interfacial Stress Transfer in an Ideal System**
I. KINLOCH, L. GONG, A. RAJU, I. RIAZ, R. JALIL, K. NOVOSELOV, R.J. YOUNG, School of Materials and the School of Physics and Astronomy, University of Manchester, UK

16.10 *A-13.5:L02* **Shape Memory Polyurethane with Graphene-iron Hybrid Nanoparticles for Helical Stents**
JUNG-HWAN JUNG, IL-KWON OH, School of Mechanical, Aerospace and Systems Engineering, KAIST, Daejeon, Republic of Korea

16.30 *A-13.5:L03* **Multifunctional Spark Plasma Sintered Graphene Nanoplatelets / Ceramic Composites**
C. RAMIREZ, P. MIRANZO, E. GARCIA, M.I. OSENDI, Instituto de Cerámica y Vidrio (ICV-CSIC), Madrid, Spain; F. FIGUEIREDO, Centre for Research in Ceramics and Composite Materials (CICECO), Aveiro, Portugal

16.50 *Break*

Session A-13.1 - Graphene Production, Processing and Chemistry

Chair: Cinzia CASIRAGHI, UK / Germany

17.20 *A-13.1:IL02* **Assembly of Graphene-Based Two-dimensional Nanosheets**
XINLIANG FENG, Max-Planck Institute for Polymer Research, Mainz, Germany & Shanghai Jiao Tong University, Shanghai, China

17.50 *A-13.1:IL03* **Preparation of Graphene and Its Electronic Properties**
YUNQI LIU, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China

18.20 *A-13.1:L04* **Epitaxial Graphene Grown by High-temperature Sublimation on 3C-SiC**
V. DARAKCHIEVA[1], A. BOOSALIS[2], T. HOFMANN[2], M. SCHUBERT[2], T. IAKIMOV[1], R. VASILIAUSKAS[1], Y. REZA[1], C. BOUHAFS[1], R. YAKIMOVA[1], [1]Linköping University, Sweden; [2]University of Nebraska-Lincoln, USA

Session A-14.1 - Smart Materials for High Efficiency Solar Cells

Room: **ZENITH**

Chairs: Yoon-Bong HAHN, South Korea & S.Ravi P. SILVA, UK *(Programme Chairs)*

14.55 *Welcome by Programme Chairs*

15.00 *A-14.1:IL01* **Carbon Nanotube-organic Hybrid Solar Cells for Energy Harvesting**
S.R.P. SILVA, Nanoelectronics Centre, Advanced Technology Institute, University of Surrey, Guildford, UK

15.30 *A-14.1:IL02* **Light Harvesting Schemes for High-performance Polymer Solar Cells**
FANG-CHUNG CHEN, JYH-LIH WU, CHIA-LING LEE, YI HONG, MING-KAI CHUANG, KIM-SHIH TAN, Department of Photonics and Display Institute, National Chiao Tung University, Hsinchu, Taiwan

16.00 *A-14.1:L04* **Effective Harvesting of Photons Using Smart Material Systems for Solar Energy Conversion**
I.M. DHARMADASA, Materials & Engineering Research Institute, Sheffield Hallam University, Sheffield, UK

16.20 *A-14.1:L05* **Bi2S3 Nanoparticles Supported on CNT-TiO2 Matrices for Photovoltaic Applications: a Comparative Study of Preparation Methods**
M.E. RINCON, **J.C. CALVA**, M. SOLÍS, Centro de Investigación en Energía- UNAM, Temixco, Morelos, Mexico

16.40 *Break*

17.10 *A-14.1:IL07* **Organic Solar Cells: How they Work and How to Improve them**
D. FICHOU, Université Pierre et Marie Curie - Paris 6, Institut Parisien de Chimie Moléculaire, UMR CNRS 7201, Paris, France

17.40 *A-14.1:L09* **Influence of the Indium Precursors on ITO Properties Grown by Metal-organic Chemical Vapor Deposition**
P.D. SZKUTNIK, M. CARRILLO, F. WEISS, C. JIMÉNEZ, Laboratoire des Matériaux et du Génie Physique, UMR 5628 CNRS - Grenoble INP, Grenoble, France; V. LAHOOTUN, Advanced Materials for Semiconductor and Photovoltaics - AMSP Air Liquide - R&D CRCD; X. MESCOT, Institut de la Micréolectronique, Electromagnétisme, Photonique, Hyperfréquences UMR5130 CNRS - Grenoble INP, Grenoble, France

Session A-15.1 - Shape Memory Polymers

Room: **VENERE**

Chair: Andreas LENDLEIN, Germany *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *A-15.1:IL01* **Shape Memory Elastomers Based on Ionomer Compounds**
R.A. WEISS, J. DONG, University of Akron, Akron, OH, USA

15.30 *A-15.1:IL02* **Tunable Shape-Memory Media from Physically Modified Thermoplastic Elastomers**
R.J. SPONTAK, Depts of Chemical & Biomolecular Engineering and Materials Science & Engineering, North Carolina State University, Raleigh, NC, USA

16.00 *A-15.1:L03* **Multiple Shape-memory Behavior of Polyethylene/ Polycyclooctene Blends Cross-linked by Electron Irradiation**
H.-J. RADUSCH[1], I. KOLESOV[1], U. GOHS[2], G. HEINRICH[2], [1]University of Halle-Wittenberg, Department of Engineering Sciences, Halle (Saale), Germany; [2]Leibniz Institute of Polymer Research Dresden, Dresden, Germany

16.20 *A-15.1:IL04* **Biocompatible and Degradable Polydepsipeptide based Multiblock Copolymers with Shape-memory Capability**
M. BEHL[1, 2], Y. FENG[2, 3], A. LENDLEIN[1, 2], [1]Center for Biomaterial Development and Berlin Brandenburg Center for Regenerative Therapies, Institute of Polymer Research, Helmholtz-Zentrum Geesthacht, Teltow, Germany; [2]Tianjin University-Helmholtz-Zentrum Geesthacht, Joint Laboratory for Biomaterials and Regenerative Medicine, Tianjin, China; [3]School of Chemical Engineering and Technology, Tianjin University, Tianjin, P. R. China

16.50 *Break*

Chair: Patrick MATHER, USA

17.20 *A-15.1:L06* **Mechanically-driven Recovery in Amorphous Polymer Networks Programmed for Shape Memory**
C.M. YAKACKI, The University of Colorado at Denver, Denver, CO, USA; K.A. GALL, The Georgia Institute of Technology, Atlanta, GA, USA; T.D. NGUYEN, Johns Hopkins University, Baltimore, MD, USA

17.40 *A-15.1:L07* **On the Validity of Time-Temperature Equivalence for Wide Frequency Band Analysis of Shape Memory Polymers**
X. GABRION, E. FOLTETE, V. PLACET, M. COLLET, **M. OUISSE**, FEMTO-ST Applied Mechanics, Besançon, France

18.00 *A-15.1:L08* **Synthesis and Characterization of Monofunctionalized Poly(ω-pentadecalactone) with Isocyanato Ethylmethacrylate and Polymers based thereof**
M. BALK, U. NÖCHEL, M. BEHL, A. LENDLEIN, Centre for Biomaterial Development, Institute of Polymer Research, Helmholtz-Zentrum Geesthacht, Teltow, Germany

18.20 *A-15.1:L09* **Molecular Dynamics Simulations for Micro-Vascular Shape Memory Composites**
J.D. DAVIDSON, Y. LI, **N.C. GOULBOURNE**, Aerospace Engineering, University of Michigan, Ann Arbor, MI, USA

Symposium B - State-of-the-art Research & Application of SMAs Technologies

Room: **SMERALDO 1**

Chair: Stefano BESSEGHINI, Italy *(Programme Chair)*

14.55 *Welcome by Programme Chair*

Session B-1 - Materials

15.00 *B-1:IL01* **Development of Ni-free Beta-Titanium Shape Memory Alloys**
S. MIYAZAKI, HEE YOUNG KIM, Division of Materials Science, University of Tsukuba, Tsukuba, Japan

15.30 *B-1:IL02* **Nanostructured Shape Memory Alloys: Processing, Martensitic Phase Transformations, Properties**
T. WAITZ, C. MANGLER, G. STEINER, A. KOMPATSCHER, University of Vienna, Physics of Nanostructured Materials, Vienna, Austria; M. PETERLECHNER, University of Münster, Institute of Materials Physics, Münster, Germany; T. ANTRETTER, F.D. FISCHER, Montanuniversität Leoben, Institute of Mechanics, Leoben, Austria; P. MÜLLNER, Boise State University, Materials Sciende & Engineering, Boise, Idaho, USA

16.00 *B-1:IL03* **High Temperature Shape Memory Alloys**
J. PONS, R. SANTAMARTA, C. PICORNELL, E. CESARI, Dept. Fisica, Universitat de les Illes Balears, Palma de Mallorca, Spain

16.30 *Break*

Session B-2 - Phase Transformation and Microstructure

Chair: Shuichi MIYAZAKI, Japan

17.00 *B-2:IL01* **Microstructure, Mechanism and Mesoscopic Modeling of Shape Memory Alloys**
A. SAXENA, Los Alamos National Lab., Los Alamos, NM, USA

17.30 *B-2:IL02* **Mechanisms of Twinning and Twin Structures in Ni-Mn-Ga**
P. MÜLLNER, B. MUNTIFERING, Boise State University, Boise, ID, USA; R.C. POND, University of Exeter, UK

18.00 *B-2:IL03* **Magnetic Shape Memory Materials: Martensitic Structures and Transformation Behaviour**
L. RIGHI, Dipartimento di Chimica GIAF, Università di Parma, Parma, Italy; S. FABBRICI, F. ALBERTINI, IMEM-CNR, Parma, Italy

18.30 *B-2:IL04* **TEM Analyses of Various Domain Structures in Shape Memory Alloys**
Y. MURAKAMI, D. SHINDO, IMRAM, Tohoku University, Sendai, Japan

Symposium C - Electroactive Polymers: Advances in Materials and Devices

Room: **URANO**

Chair: Steen SKAARUP, Denmark *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *Key-note Lecture*

C:KL **Soft Active Polymer and Applications**
JINSONG LENG, Centre for Composite Materials, Science Park of Harbin Institute of Technology (HIT), Harbin, P.R. China

Session C-1 - Advances in EAP Materials

15.40 *C-1:IL01* **Characteristic Electrical Actuation of Plasticized Poly(vinyl chloride) - Various Electrical Functions in Relation with the Dielectric Plasticizers -**
T. HIRAI, M. ALI, T. OGIWARA, D. TSURUMI, K. YAMAMOTO, T. UEKI, H. XIA, M. HASHIMOTO, Faculty of Textile Science and Technology, Shinshu University, Ueda-shi, Japan

16.10 *C-1:IL02* **Ferrorelaxor Polymers for Compact and Efficient Electro-mechanical Transducers**
Q.M. ZHANG, The Pennsylvania State University, University Park, PA, USA

16.40 *Break*

Chair: Toshihiro HIRAI, Japan

17.10 *C-1:IL04* **Smart Soft Actuators and Energy Harvesters**
S. BAUER, S. BAUER-GOGONEA, C. KEPLINGER, **I. GRAZ**, R. SCHWÖDIAUER, Soft Matter Physics, Johannes Kepler University, Linz, Austria

17.40 *C-1:L05* **Flexible and Stretchable Electrodes Based on Wrinkles for Dielectric Elastomer Actuators**
CHANGWOON NAH[1], Il-SOU YOO[1], GI-BBEUM LEE[2], A.N. GENT[1], CHANG YOON[3], [1]Energy Harvesting WCU Research Team, [2]BK-21 Polymer BIN Fusion Research Team, Department of Polymer-Nano Science and Technology, College of Engineering, Chonbuk National University, Jeonju, Republic of Korea; [3]Department of Animal Biotechnology, College of Agriculture and Life Sciences, Chonbuk National University, Jeonju, Republic of Korea

18.00 *C-1:L06* **Synthesis of Stable Polyaniline and Polypyrrole Nanospheres**
J.R. LAMB, A.J. SURYAWANSHI, **V.J. GELLING,** Department of Coatings and Polymeric Materials, North Dakota State University, Fargo, ND, USA

Session D-1 - Adaptive/Active Textiles

Room: **ALBA 2**

Chair: Cosimo CARFAGNA, Italy *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *D-1:IL01* **Biomimicry in Textiles: Past, Present and Potential**
T.K. GHOSH, L. EADIE, College of Textiles, North Carolina State University, Raleigh, NC, USA

15.30 *D-1:IL02* **Photovoltaics go Textile: Fundamental Considerations and Materials Aspects to Realize Dye-sensitized Solar Cells on Textile Electrodes**
D. SCHLETTWEIN, Justus-Liebig-University Gießen, Institute of Applied Physics, Gießen, Germany

16.00 *D-1:L04* **Development of Piezoresistive Fibre Sensors, Based on Carbon-thermoplastic Elastomer Compounds, for Textile Application**
F. CLEMENS[1], B. KOLL[1], T. GRAULE[1], T. WATRAS[1, 2], M. BINKOWSKI[2], [1]Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; [2]University of Silesia, Faculty of Computer and Materials Science, Poland

16.20 *D-1:IL06* **Integration of OLEDs in Textiles**
S. JANIETZ, Fraunhofer Institute for Applied Polymer Research, Potsdam, Germany

16.50 *Break*

Chair: Tushar GHOSH, USA

17.20 *D-1:IL07* **Application of Melt-blown Technology for Manufacturing the Sensor Non-woven Fabrics Composed of Polymers Loaded with Multi-wall Carbon Nanotubes**
I. KRUCINSKA, B. SURMA, M. CHRZANOWSKI, E. SKRZETUSKA, M. PUCHALSKI, Department of Material and Commodity Sciences and Textile Metrology, Faculty of Material Technologies and Textile Design, Technical University of Lodz, Lodz, Poland

17.50 *D-1:L08* **The Concept of Mood Changing Garments Made from Luminescent Woven Fabrics and Flexible Photovoltaics**
G. STYLIOS, DANYING, Research Institute for Flexible materials (RIFleX), Heriot Watt University, Edinburgh, Scotland, UK

18.10 *D-1:L09* **Production of PEDOT Coated Conductive Fibers for Smart & Interactive Textile Applications**
T. BASHIR, M. SKRIFVARS, School of Engineering, University of Boras, Boras, Sweden; N.-K. PERSSON, The Swedish School of Textiles, University of Boras, Boras, Sweden

MONDAY JUNE 11 AFTERNOON

Symposium E - Next Generation Micro/Nano Systems

Room: **SIRIO**

Chair: Leandro LORENZELLI, Italy *(Programme Chair)*

14.55 *Welcome by Programme Chair*

Session E-9 - Emerging MEMS / NEMS Technologies

15.00 *E-9:IL01* **Atomic Layer Deposition for MEMS & NEMS**
P.M. SARRO, G. FIORENTINO, G. PANDRAUD, Y. HUANG, Delft University of Technology, DIMES, The Netherlands

15.30 *E-9:IL02* **Functional RF Devices Powered by MEMS Technologies**
K. HASHIMOTO, Chiba University, Chiba, Japan; S. TANAKA, M. ESASHI, Tohoku University, Sendai, Japan

16.00 *Break*

Session E-1 - Physical MEMS / NEMS

Chair: Ken-ya HASHIMOTO, Japan

16.30 *E-1:IL01* **Wet Process Innovation in MEMS 3-D Structuring on a Silicon Wafer**
K. SATO, Nagoya University, Nagoya, Japan

17.00 *E-1:IL02* **GaN Resonant MEMS**
M. FAUCHER, V. BRANDLI, B. GRIMBERT, M. FRANCOIS, P. TILMANT, A. BEN-AMAR, L. BUCHAILLOT, C. GAQUIERE, D. THÉRON, CNRS, IEMN, Lille, France; Y. CORDIER, F. SEMOND, CNRS CRHEA, Valbonne, France

17.30 *E-1:IL03* **History and Recent Progress of MEMS Physical Sensors**
H. MURO, Chiba Institute of Technology, Narashino, Japan

18.00 *E-1:IL04* **Towards Flexible Integrated Systems over Large Areas**
R.S. DAHIYA, Centre for Materials and Microsystems, Fondazione Bruno Kesseler, Trento, Italy

Session F-1 - Nanophotonics and Smart Optical Nanostructures

Room: **GIOVE**

Chair: Giancarlo RIGHINI, Italy *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *F-1:IL01* **Nonlinear and Switchable Plasmonic Metamaterials**
N.I. ZHELUDEV, **K. MacDONALD**, Optoelectronics Research Centre & Centre for Photonic Metamaterials, University of Southampton, Southampton, UK

15.30 *F-1:IL03* **Realization of Optical Components and Planar-light-wave-circuits with CMOS Technology**
G. PUCKER, Y. JESTIN, M. GHULINYAN, Advanced Photonics and Photovoltaics Unit, Bruno Kessler Foundation, Trento, Italy

16.00 *F-1:IL04* **Gas Cluster Ion Beam Technology for Nanofabrication**
N. TOYODA, I. YAMADA, Graduate School of Engineering, University of Hyogo, Himeji, Japan

16.30 *F-1:IL05* **Enhanced Broadband Light-matter Interaction with Quantum Dots**
B.D. GERARDOT, Department of Physics, Heriot-Watt University, Edinburgh, UK

17.00 *Break*

Chair: Brian D. GERARDOT, UK

17.30 *F-1:IL06* **Diffractive Control of Femtosecond Pulses with Programmable Spatial Light Modulators**
P. ANDRES, Departamento de Óptica, Universitat de Valencia, Burjassot, Spain; J. LANCIS, Instituto de Nuevas Tecnologías de la Imagen, Universitat Jaume I de Castellón, Castelón, Spain

18.00 *F-1:IL07* **Passive and Active Nanophotonics**
Y. FAINMAN, D. TAN, S. ZAMEK, O. BONDARENKO, A. SIMIC, A. MIZRAHI, M. NEZHAD, V. LOMAKIN, Q. GU, J. LEE, M. KHAJAVIKHAN, B. SLUTSKY, Dept. of Electrical and Computer Engineering, University of California, San Diego, La Jolla, CA, USA

18.30 *F-1:L08* **Magneto-optical and Plasmonic Properties of Thin Film Ternary Alloy Sensors**
J.R. SKUZA, National Institute of Aerospace, Hampton, VA, USA; S.H. CHOI, NASA Langley Research Center, Hampton, VA, USA

MONDAY JUNE 11 AFTERNOON

Symposium G - Emboding Intelligence in Structures and Integrated Systems

Room: **LE PLEIADI**

Chairs: Costas PAPADIMITRIOU, Greece
André PREUMONT, Belgium

14.55 *Welcome by Programme Chair Fabio Casciati*

Session G-1 - Smart Materials, Sensors, Actuators

15.00 *G-1:IL01* **Development of Some Smart Sensors for Monitoring Civil Infrastructures**
XINCHUN GUAN, HUI LI, JINPING OU, Harbin Institute of Technology, Harbin, China

15.30 *G-1:IL03* **Optimal Sensor Placement for Parameter Estimation in Dynamic Systems**
C. PAPADIMITRIOU, D.-C. PAPADIOTI, University of Thessaly, Volos, Greece

16.00 *G-1:IL04* **Wavefront Control of Future Large Thin Shell Space Telescopes**
A. PREUMONT, R. BASTAITS, E. ROMNEE, I. SURDEJ, ULB, Active Structures Laboratory, Brussels, Belgium; G. RODRIGUES, ESA-ESTEC, Structures Section, Noordwijk, The Netherlands

16.30 *Break*

17.00 *G-1:IL05* **Fatigue of NiTi for Dampers and Actuators**
A. ISALGUE, V. TORRA, Dep. Fisica Aplicada, Universitat Politecnica Catalunya, Barcelona, Spain; F. CASCIATI, Dip. Mec. Str., Università Pavia, Italy; S. CASCIATI, DARC, Università Catania, Italy

17.30 *G-1:IL06* **Smart, Active Fiber Devices and Approaches to Realizing Textile Composites for Sensing and Energy Harvesting**
M. SHTEIN, K. PIPE, S. MORRIS, S. BISWAS, B. O'CONNOR[1], A. YADAV[1], University of Michigan, Ann Arbor, MI, USA; [1]Currently at North Carolina State University, USA

18.00 *G-1:IL07* **Modeling of Multifunctional Hybrid SMA-ceramic Composites**
D.C. LAGOUDAS, B.T. LESTER, Y. CHEMISKY, A. PARRINELLO, Texas A&M University, Dept. of Aerospace Engineering, College Station, TX, USA

Session G-5 - Ongoing and Perspective Applications

18.30 *G-5:IL02* **On the Use of Statistical Pattern Recognition Methods for Structural Health Monitoring**
A. KIREMIDJIAN, H.Y. NOH, D. JAISWAL, R. RAJAGOPAL, Department of Civil and Environmental Engineering, Stanford University, Stanford, CA, USA

Symposium H - Mining Smartness from Nature

Room: **SMERALDO 2**

Chair: Nadrian C. SEEMAN, USA *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *Keynote Lecture*

H:KL **Biomimetics: Lessons from Nature**
B. BHUSHAN, Ohio Eminent Scholar and The Howard D. Winbigler Professor Director, Nanoprobe Laboratory for Bio- & Nanotechnology and Biomimetics The Ohio State University, OH, USA

Session H-1 - Algorithms, Mechanisms and Structures in Nature as an Inspiration for Mimicking

15.40 *H-1:IL01* **Biologically-inspired Reversible Adhesives: Where are we now?**
S.N. GORB, Department of Functional Morphology and Biomechanics, Zoological Institute at the University of Kiel, Kiel, Germany

16.10 Break

16.40 *H-1:IL05* **How to Control Bacteria to Act like Microrobots**
S. MARTEL, Nanorobotics Laboratory, Department of Computer and Software Engineering, Ecole Polytechnique de Montreal (EPM), Montreal, Canada

17.10 *H-1:IL06* **Cellulose Nanowhiskers: Orienting, Assembling and Interfacial Control**
S.J. EICHHORN, School of Physics College of Engineeering, Mathematics and Physical Sciences, University of Exeter, Exeter, UK

Session H-4 - Biologically Inspired Systems and Robotics

17.40 *H-4:IL05* **Bio-inspired Gecko-mimicking Robot: From Locomotion Behaviour and Dynamics to Robot Design**
ZHENDONG DAI, ZHIWEI YU, HAO ZHANG, AIHONG JI, ZHOUYI WANG, Institute of Bio-inspired Structure and Surface Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China

Symposium I - Progress in Wearable/Wireless Body Sensor Networks for Healthcare Applications

Room: **TURCHESE**

Chair: Dermot DIAMOND, Ireland *(Programme Chair)*

14.55 *Welcome and Introductive Remarks by Programme Chair*

Session I-1 - Sensor Technology

15.15 *I-1:IL01* **Techniques for Contact-free Monitoring - Current Applications and Challenges**
S. LEONHARDT, Philips Chair for Medical Information Technology, Helmholtz-Institute, RWTH Aachen University, Aachen, Germany

15.45 *I-1:IL02* **Continuous Monitoring of Functional Activities using Wearable, Wireless Gyroscope and Accelerometer Technology**
R.C. WAGENAAR, I. SAPIR, Y. ZHANG, S. MARKOVIC, L.M. VAINA, T.D.C. LITTLE, Boston University, Boston, MA, USA

16.15 *I-1:IL03* **Sensing Biological Signals under Ambient Assisted Living**
KWANG SUK PARK, Seoul National University, Seoul, Korea

16.45 *I-1:L04* **Smart Hydrogel-based Biochemical Microsensor Array for Medical Diagnostics**
M. GUENTHER, G. GERLACH, T. WALLMERSPERGER, Technische Universität Dresden, Dresden, Germany; M.N. AVULA, S.H. CHO, X. XIE, B.V. DEVENER, F. SOLZBACHER, P. TATHIREDDY, J.J. MAGDA, University of Utah, Salt Lake City, UT, USA; C. SCHOLZ, R. OBEID, T. ARMSTRONG, University of Alabama in Huntsville, Huntsville, AL, USA

17.05 *Break*

Session I-2 - Smart Fabrics and Wearables

Chair: Steffen LEONHARDT, Germany

17.35 *I-2:IL01* **Upperlimb Gesture Reconstruction through Textile and Inertial Sensory Fusion**
F. LORUSSI, A. TOGNETTI, N. CARBONARO, G. ANANIA, **D. DE ROSSI**, Centro Interdipartimentale di Ricerca "E. Piaggio", Università di Pisa, Pisa, Italy

18.05 *I-2:IL02* **Adhesive Bonding Technology for Reliable Interconnections of Smart Embedded Electronic Modules and Various Textile Circuits**
M. VON KRSHIWOBLOZKI, T. LINZ, Fraunhofer IZM, Berlin, Germany; A. NEUDECK, TITV, Greiz, Thüringen, Germany

18.35 *I-2:L03* **A Wearable Remote Brain Machine Interface Using a Smartphone and the Mobile Network**
P. SHYAMKUMAR, S. OH, N. BANERJEE, V.K. VARADAN, Department of Electrical Engineering & Department of Computer Science and Computer Engineering, University of Arkansas, Fayetteville, AR, USA

18.55 *I-2:L04* **A Novel Wearable System for Elderly Monitoring**
T. FAETTI, R. PARADISO, Smartex srl, Navacchio (PI), Italy

Session J-1 - Active and Stimuli Responsive Biomaterials

Room: **SMERALDO 3**

Chair: E. Pasquale SCILINGO, Italy *(Programme Chair)*

14.55 *Welcome by Programme Chair*

15.00 *J-1:IL01* **Design and Development of Light Sensitive Chitosan Based Nanocarriers for Gene Delivery**
N. DUCEPPE, **M. TABRIZIAN**, Biomedical Engineering Department, McGill University, Montreal, Quebec, Canada

15.30 *J-1:IL02* **Movable Polyrotaxanes for Enhancing Mutivalent Interaction with Receptor Proteins**
N. YUI, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan

16.00 *J-1:IL03* **Smart Nano-bio Materials within Cellular Machinery**
E.A. ROZHKOVA, Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL, USA

16.30 *Break*

Chair: Maryam TABRIZIAN, Canada

17.00 *J-1:IL04* **Design of Biodegradable Injectable Polymers Exhibiting Temperature-responsive Sol-gel Transition**
Y. OHYA, Department of Chemistry and Materials Engineering, Kansai University, Suita, Osaka, Japan

17.30 *J-1:IL05* **Ureido-polymers Exhibiting UCST-type Phase Transition Behavior under Physiologically Relevant Conditions**
N. SHIMADA, M. NAKAYAMA, A. KANO, **A. MARUYAMA**, Institute for Materials Chemistry and Engineering, Kyushu University, Fukuoka, Japan

Session A-1.1 - Electroceramics

Room: **VENERE**

Chair: Katsuhisa TANAKA, Japan

9.00 *A-1.1:IL01* **Multifunctional Thin Films and Heterostructures by MOCVD and Combined Chemical Routes**
F. WEISS, A. BARTASYTE, C. JIMENEZ, J.L. DESCHANVRES, E. SARIGIANNIDOU, M. AUDIER, S. PIGNARD, J. KREISEL, V. CONSONNI, G. REY, E. PUYOO, G. GIUSTI, D. BELLET, LMGP - Grenoble INP - CNRS - Minatec, Grenoble, France

9.30 *A-1.1:IL02* **Unusual Higher Order Coupling in Piezoelectric and Ferroelectric Materials**
W.S. OATES, Department of Mechanical Engineering Florida A&M/ Florida State University Tallahassee, FL, USA

10.00 *A-1.1:IL04* **Charge Density Studies of Piezoelectric Ceramics: Characteristic Chemical Bonding and Thermal Motion**
Y. KUROIWA, Department of Physical Science, Hiroshima University, Kagamiyama, Higashi-Hiroshima, Hiroshima, Japan

10.30 *Break*

Chair: François WEISS, France

11.00 *A-1.1:L05* **Impact of Sputter Deposition Parameters on the Leakage Current Behaviour of Aluminum Nitride Thin Films**
M. SCHNEIDER, T. STRUNZ, A. BITTNER, U. SCHMID, Vienna University of Technology, Institute of Sensor and Actuator Systems, Vienna, Austria

11.20 *A-1.1:L06* **Study of Piezoelectric Actuation in Flexible AlN Cantilevers**
S. PETRONI, M. AMATO, Center for Biomolecular Nanotechnologies @UNILE, Istituto Italiano di Tecnologia, Arnesano (LE), Italy; G. MARUCCIO, F. GUIDO, M. DEVITTORIO, Dip. Ingegneria dell'Innovazione of Università del Salento, Lecce, Italy; M.T. TODARO, A. CAMPA, A. PASSASEO, National Nanotechnology Laboratory of CNR-INFM, Lecce, Italy

11.40 *A-1.1:L09* **Dielectric and Ferroelectric Analysis of Nanoparticle/ Nanocrystalline Barium Titanate and PLZT for use in Smart Inorganic Materials Systems**
C.B. DIANTONIO, T. MONSON, M.R. WINTER, T.P. CHAVEZ, P. YANG, Sandia National Laboratories, Albuquerque, NM, USA

12.00 *A-1.1:L10* **Controlled Assembly of Two-dimensional Oxide Nanosheets for Tailored Dielectric Materials**
M. OSADA, T. SASAKI, International Center for Materials Nanoarchitectonics, National Institute for Materials Science, Tsukuba, Japan, & CREST, Japan Science and Technology Agency (JST), Japan

Room: **AUDITORIUM**

Session A-6.2 - Functional Porous Materials

Chair: Shinji INAGAKI, Japan

9.00 *A-6.2:L02* **Long-range Ordered Hierarchical Mesoporous Films for Energy Saving Applications by Rational Selection of the Templating Agent**
R. BUONSANTI, T.E. PICK, N. KRINS, L. ZHU, B.A. HELMS, D.J. MILLIRON, The Molecular Foundry, Inorganic Nanostructures, Lawrence Berkeley National Laboratory Berkeley, California, USA

9.20 *A-6.2:L03* **Polybenzoxazine-based Porous Carbon: Pore Structure Design and its Application**
U. THUBSUANG, S. WONGKASEMJIT, T. CHAISUWAN, The Petroleum and Petrochemical College Chulalongkorn University, Bangkok, Thailand

9.40 *A-6.2:L04* **Preparation of Microporous Carbon Fibers Through Carbon-ization of Al-based Porous Coordination Polymer with Furfuryl Alcohol**
J. REBOUL[1, 2], L. RADHAKRISHNAN[5], S. FURUKAWA[1, 2], S. KITAGAWA[1, 2], P. SRINIVASU[5], Y. YAMAUCHI[3, 4, 5]; [1]ERATO Kitagawa Integrated Pores Project, JST, Shimogyo, Kyoto, Japan; [2]iCeMS, Kyoto University, Yoshida, Sakyo, Kyoto, Japan; [3]WPI, Research Center for Materials Nanoarchitectonics (MANA), NIMS, Namiki, Tsukuba, Ibaraki, Japan; [4]Fac. of Science and Engineering, Waseda University, Okubo, Shinjuku, Tokyo, Japan; [5]PRESTO, JST, Honcho, Kawaguchi, Saitama, Japan

10.00 *A-6.2:L05* **Combination of Porous Polymer Membrane and Novel Membrane Separation Technique for High Energy Conversion Efficiency**
T. URAGAMI, Department of Chemistry and Materials Engineering, Kansai University, Osaka, Japan

10.20 *A-6.2:L06* **Development of New Non Oxide Hybrid and Ceramic Membranes for Hydrogen Separation**
L. CHAREYRE, S. CERNEAUX, V. ROUESSAC, A. JULBE, D. CORNU, Institut Européen des Membranes (I.E.M.)-E.N.S.C.M., Montpellier, France

10.40 *Break*

Session A-6.1 - Multifunctional Materials, Hybrids and Nanocomposites

Chair: Sanjay MATHUR, Germany

11.10 *A-6.1:IL11* **Organic-inorganic Hybrid Materials for Green Photonics**
L.D. CARLOS, Department of Physics and CICECO, University of Aveiro, Aveiro, Portugal

11.40 *A-6.1:IL12* **Light-weight, Transparent, and Hard Mmultifunctional Materials Based on Nanocellulose-inorganic Nanoparticle Hybrids**
G. SALAZAR-ALVAREZ, Department of Materials and Environmental Chemistry, Stockholm University, Stockholm, Sweden, & Wallenberg Wood Science Center, Royal Institute of Technology, Stockholm, Sweden

Special Session A-10 - Emerging Non-volatile Memory Devices

Room: **PLUTONE**

Chair: Shashi PAUL, UK *(Programme Chair)*

9.25 *Welcome by Programme Chair*

9.30 *A-10:IL01* **Towards Charge Storage Memory Devices Based on Electroactive Organic Molecules**
J. VECIANA[1], C. SIMÃO[1], M. MAS-TORRENT[1], N. CRIVILLERS[1], V. LLOVERAS[1], J.M. ARTÉS[2], P. GOROSTIZA[2], C. ROVIRA[1], [1]Institut de Ciència de Materials de Barcelona (CSIC)-Networking Research Center on Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN), Bellaterra, Spain; [2]Institute for Bioengineering of Catalonia (IBEC), Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain, Networking Research Center on Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN), Universitat de Barcelona, Barcelona, Barcelona, Spain

10.00 *A-10:IL02* **Nanosecond Timescale Characterization of FeRAMs with Fast-speed Charge Injection**
A.Q. JIANG, State Key Lab of ASIC & System, Department of Microelectronics, Fudan University, Shanghai, China

10.30 *A-10:L04* **Organic and Oxide Ferroelectric Transistor and Diode Arrays for Non-volatile Memories**
A. VAN BREEMEN, F. GONZALEZ-RODRIGUEZ, B. VAN DER PUTTEN, G. GELINCK, Holst Centre/TNO, Eindhoven, The Netherlands; A. MARRANI, M. BASSI, Solvay Specialty Polymers s.p.a., Bollate (MI), Italy

10.50 *Break*

Chair: Jaume VECIANA, Spain

11.20 *A-10:IL05* **Working Model for Electronic Polymer Memory Devices**
S. PAUL, Emerging Technologies Research Centre, De Montfort University, Leicester, UK

11.50 *A-10:IL08* **Self-rectifying Unipolar HfOx Based RRAM**
HONGYU YU, South University of Science and Technology of China; X.A. TRAN, Nanyang Technological University, Singapore

12.20 *A-10:IL09* **Ultrafast MRAM Data Storage**
S. SERRANO-GUISAN, N. LIEBING, H.W. SCHUMACHER, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany

Session A-12.2 - Photonic, Nanophotonic, Plasmonic and Infrared Metamaterials

Room: **ORSA MAGGIORE**

Chair: Martti KAURANEN, Finland

9.00 *A-12.2:IL01* **Taming the Blackbody with Infrared Metamaterials**
XIANLIANG LIU, **W.J. PADILLA**, Boston College, Newton, MA, USA

9.30 *A-12.2:IL02* **Enhancement of Light-matter Interactions in Slow-wave Meta-surfaces**
LEI ZHOU, State Key Laboratory of Surface Physics and Physics Department, Fudan University, Shanghai, China

10.00 *A-12.2:IL04* **Active Nanodevices: the Next Challenge for Plasmonics**
G. WURTZ, A.V. ZAYATS, Department of Physics, King's College London, London, UK

10.30 *A-12.2:L07* **Imaging the Local Field Enhancements in Metamaterial Unit Cells with Femtosecond Laser Pulses**
V.K. VALEV, T. VERBIEST, Molecular Electronics and Photonics, INPAC, K.U. Leuven, Leuven, Belgium; A.V. SILHANEK, V.V. MOSHCHALKOV, Superconductivity and Magnetism & Pulsed Fields Group, INPAC, Katholieke Universiteit Leuven, Belgium; B. DE CLERCQ, M. AMELOOT, University Hasselt and Transnational University Limburg, BIOMED, Diepenbeek, Belgium; O.A. AKTSIPETROV, Dept. of Physics, Moscow State University, Moscow, Russia; A.I. KUZNETSOV, C. REINHARDT, B.N. CHICHKOV, Laser Zentrum Hannover e.V., Hanover, Germany; E.J. OSLEY, P.A. WARBURTON, London Centre for Nanotechnology, University College London, London, UK; Dept. of Electronic and Electrical Engineering, University College London, London, UK; X. ZHENG, V. VOLSKIJ, G.A.E. VANDENBOSCH, SAT-TELEMIC, Katholieke Universiteit Leuven, Leuven, Belgium

Room: **ORSA MINORE**

Session A-13.1 - Graphene Production, Processing and Chemistry

Chair: Luigi COLOMBO, USA

9.00 *A-13.1:IL06* **Exploring the Synthesis and Applications of Graphene**
J. WASSEI, S. DUBIN, J. TORRES, **R.B. KANER**, Department of Chemistry & Biochemistry, Department of Materials Science and Engineering and California NanoSystems Institute, University of California, Los Angeles, California

9.30 *A-13.1:L07* **Graphene Growth on Non-metallic Substrates: Approaches and Perspectives**
H. SACHDEV, R. RENNER, K. MÜLLEN, Max Planck Institute for Polymer Research, Mainz, Germany

9.50 *A-13.1:L08* **Systematic Comparative Study of Thermally and Extreme-UV Reduced Graphene Oxide**
F. PERROZZI, S. PREZIOSO, M. DONARELLI, F. BISTI, M. NARDONE, S. SANTUCCI, **L. OTTAVIANO**, Dipartimento di Fisica, Università dell'Aquila, L'Aquila, Italy; E. TREOSSI, V. PALERMO, CNR-ISOF, Bologna, Italy

10.10 *A-13.1:L10* **Study of Na Intercalation of Ex-situ Grown Graphene on 6H-SiC(0001) by SPELEEM**
C. XIA[1], S. WATCHARINYANON[1], A.A. ZAKHAROV[2], L.I. JOHANSSON[1], R. YAKIMOVA[1], C. VIROJANADARA[1], [1]Department of Physics, Chemistry, and Biology (IFM), Linköping University, Linköping, Sweden; [2]MAX-lab, Lund University, Lund, Sweden

10.30 *Break*

Session A-13.2 - Electronic and Optical Properties

Chair: Xinliang FENG, China

11.00 *A-13.2:IL01* **Electronic Structure of Nanographene; Edge State and Electron Wave Interference**
T. ENOKI, Tokyo Institute of Technology, Tokyo, Japan

11.30 *A-13.2:IL02* **Molecular Functionalization for Engineering Transport Properties of Graphene**
REN-JYE SHIUE[1], HUNG-CHIEH CHENG[2], SHAO-YU CHEN[1], PO-HSUN HO[2], CHUN-WEI CHEN[2], YIT-TSONG CHEN[1, 2], **WEI-HUA WANG**[1], [1]Academia Sinica, Taiwan; [2]National Taiwan University, Taiwan

12.00 *A-13.2:IL03* **Electronic Structure Calculations of Self-assembled Monolayers on Graphene and Graphene Nanoribbons**
D. BELJONNE, S. OSELLA, LIPING CHEN, University of Mons, Mons, Belgium

Room: **ZENITH**

Session A-14.1 - Smart Materials for High Efficiency Solar Cells

Chair: Fang-Chung CHEN, Taiwan

9.00 *A-14.1:IL11* **All-polymer Solar Cells Based on Perylene-diimide Copolymers: From Material Design to Photovoltaic Performances**
S. LUZZATI, E. KOZMA, D. KOTOWSKI, M. CATELLANI, Istituto per lo Studio delle Macromolecole, Consiglio Nazionale delle Ricerche, Milan, Italy

9.30 *A-14.1:IL14* **New Catalysts for Production of Solar Fuels**
IB CHORKENDORFF, Danish National Research Foundation's Center for Individual Nanoparticle Functionality (CINF), Dept. of Physics, Technical University of Denmark, Kongens Lyngby, Denmark

10.00 *A-14.1:L15* **Polarizing Field Effect on Charge Transfer in Hybrid Photovoltaic Cells with Ferroelectric Bi-layers**
SOUMEN DAS, DAAN LIU, YOON BONG HAHN, School of Semiconductor and Chemical Engineering, Chonbuk National University, Jeonju, South Korea

10.20 *Break*

Session A-14.2 - Smart Materials for Self-power Generators

Chair: Keon Jae LEE, Korea

10.50 *A-14.2:IL01* **Energy Harvesting on Vibration: A Performance Comparison Between Ferroelectric and Electrostricive Polymer Material**
D. GUYOMAR, P.-J. COTTINET, M. LALLART, L. LEBRUN, Universite de Lyon, INSA-LYON, Villeurbanne, France

11.20 *A-14.2:IL02* **Highly Efficient Power Generation Using Piezoelectric and Semiconducting Coupled Properties**
SANG-WOO KIM, Sungkyunkwan University (SKKU), Suwon, South Korea

11.50 *A-14.2:L04* **Thermoelectric Generating Properties of Aurivillius Compounds**
H. KOHRI, T. YAGASAKI, Kogakuin University, Hachioji, Tokyo, Japan

Room: **SMERALDO 1**

Session B-1 - Materials

Chair: Eckard QUANDT, Germany

8.30 *B-1:IL05* **New Trends in Research and Applications of SMA Technologies**
K. AKATYEVA, V. AFONINA, F. ALBERTINI, S. VON GRATOWSKI, A. IRZHAK, S. FABBRICI, R. GIZATULLIN, V. KHOVAYLO, **V. KOLEDOV**, V. SHAVROV, A. SHELYAKOV, KOTELNIKOV, IRE RAS, Moscow, Russia

9.00 *B-1:IL06* **Development of Ni- and Fe-based Magnetic Shape Memory Alloys**
R. KAINUMA, Department of Material Science, Graduate School of Engineering, Tohoku University, Sendai, Japan

9.30 *B-1:IL07* **Magnetostructural Transition Related Multifunctionality in Martensitic Heuslers**
M. ACET, L. MAÑOSA, A. PLANES, Experimentalphysik, Universität Duisburg-Essen, Duisburg, Germany; Dept. Estructura i Constituents de la Matèria, Facultat de Fìsica, Universitat de Barcelona, Barcelona, Catalonia, Spain

10.00 *B-1:L08* **Giant Effects Under High Pressure and High Magnetic Field in Co- and In- Doped NiMnGa Multifunctional Alloys**
F. ALBERTINI, S. FABBRICI, IMEM-CNR, Parma, Italy; J. KAMARAD, Z. ARNOLD, Institute of Physics, AS CR, Prague, Czech Republic; L. RIGHI, University of Parma, Chemistry Dep., Parma, Italy; D. SERRATE, P. ALGARABEL, University of Zaragoza, Inst. de Ciencia de Materiales de Aragon, Zaragoza, Spain, M. DOERR, Tech University of Dresden, Inst. Festkorperphys, Dresden, Germany; E. VAN ELFEREN, Radboud University of Nijmegen, High Field Magnet Lab, Nijmegen, Netherlands

10.20 *Break*

Session B-2 - Phase Transformation and Microstructure

Chair: Avadh B. SAXENA, USA

10.50 *B-2:IL05* **Self-accommodation of B19' Martensite in Ti-Ni Shape Memory Alloys**
M. NISHIDA, M. MITSUHARA, M. ITAKURA, Interdisciplinary Graduate School of Science and Eng., Kyushu University, Japan; T. INAMURA, Precision and Intelligence Lab., Tokyo Inst. of Technology, Japan; T. HARA, National Institute of Materials Science, Japan

11.20 *B-2:IL06* **Elasticity and Damping Characteristics of SMA Single Crystals, Polycrystals and Thin Films**
M. LANDA, H. SEINER, P. SEDLÁK, L. BODNÁROVÁ, Laboratory of Ultrasonic Methods, Institute of Thermomechanics, ASCR, Praha, Czech Republic

11.50 *B-2:IL07* **Isothermal Nature of Martensitic Transformations in Some SMAs**
T. KAKESHITA, **T. FUKUDA**, Dept. of Materials Science and Eng., Graduate School of Engineering, Osaka University, Osaka, Japan

12.20 *B-2:IL08* **Twinning in Ni-Mn-Ga Martensites**
YANLING GE, I. AALTIO, O. SÖDERBERG, S-P. HANNULA, Aalto University School of Chemical Technology, Dept. of Materials Science and Engineering, Aalto, Finland; N. ZÁRUBOVÁ, Institute of Physics, ASCR v.v.i., Prague, Czech Republic

Session C-1 - Advances in EAP Materials

Room: **URANO**

Chair: Mohsen SHAHINPOOR, USA

9.00 *C-1:IL08* **One Actuator and Several Sensors in One Device with Only Two Connecting Wires. Mimicking Muscle/brain Feedback**
T.F. OTERO[1], J.G. MARTINEZ[1], L. VALERO[1], K. ASAKA[2], I. YAHYA[3], [1]Univ. Politénica de Cartagena. Lab. of Electrochemistry Intelligent Materials and Devices, Cartagena. Spain; [2]Health Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Ikeda, Osaka, Japan; [3]Dept. of Biological Sciences and Chemistry, Univ. of Nizwa, Nizwa, Oman

9.30 *C-1:L10* **Multi-modal Stimuli Responsive Molecular Switches**
M. ZANONI[1], K.J. FRASER[1], K. WAGNER[2], R. BYRNE[1], S. GAMBHIR[2], A. GELMI[2], P. MOLINO[2], M. HIGGINS[2], P. WAGNER[2], G.G. WALLACE[2], D.L. OFFICER[2], D. DIAMOND[1]; [1]CLARITY Centre for Sensor Web Technologies, National Centre for Sensor Research, Dublin City University, Dublin, Ireland; [2]Intelligent Polymer Research Institute, University of Wollongong, Wollongong NSW, Australia

9.50 *C-1:L11* **Ultra-soft Foam-based Capacitive Sensors**
H. VANDEPARRE, T. OPPENHEIM, S.P. LACOUR, Laboratory for soft bioelectronic interfaces, EPFL, Lausanne, Switzerland

10.10 *C-1:L12* **Effect of Crack Formation on Stretchable Silver Electrode for Dielectric Elastomer Actuators**
S.H. LOW, G.K. LAU, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

10.30 *Break*

Chair: Elisabeth SMELA, USA

11.00 *C-1:IL13* **Chitosan/IPMCs Artificial Muscles**
M. SHAHINPOOR, Biomedical Engineering Laboratory Mechanical Engineering Department, University of Maine, Orono, ME, USA

11.30 *C-1:L15* **Properties of a Dielectric Elastomer Actuator Modified by Dispersion of Functionalised Carbon Nanotubes**
F. GALANTINI[1], S. BIANCHI[2], V. CASTELVETRO[1], G. GALLONE[1, 3], [1]Interdepartmental Research Centre "E. Piaggio", University of Pisa, Italy; [2]Dept. of Chemistry and Industrial Chemistry, University of Pisa, Italy; [3]Dept. of Chemical Engineering, Industrial Chemistry and Material Science, University of Pisa, Italy

11.50 *C-1:L16* **Bimodal Networks as Candidates for Electroactive Polymers**
F. BAHRT, A.E. DAUGAARD, A.G. BEJENARIU, J.M. MARIN, S. HVILSTED, **A. LADEGAARD SKOV**, Department of Chemical and Biochemical Engineering, DTU, Kgs Lyngby, Denmark

12.10 *C-1:IL03* **Microstructured Dielectric Elastomer Stack Actuator Arrays: Technology and Applications**
H.F. SCHLAAK, P. LOTZ, H. MOESSINGER, K. FLITTNER, H. HAUS, Technische Universität Darmstadt, Darmstadt, Germany

TUESDAY JUNE 12 MORNING

Room: **ALBA 2**

Session D-1 - Adaptive/Active Textiles

Chair: George K. STYLIOS, UK

9.00 *D-1:IL10* **Shape Memory Polymers in Textiles**
JINLIAN HU, The Hong Kong Polytechnic University, Hong Kong

9.30 *D-1:IL11* **Interactive Electronic Yarns by Novel Electrochemical and Plasma Treatment**
A. NEUDECK, Y. ZIMMERMANN, U. MÖHRING, TITV Greiz, Textile Research Institute Thuringia-Vogtland e.V., Greiz, Germany

10.00 *D-1:IL12* **Cosmeto-textiles: State of the Art and Future Perspectives**
P. PERSICO, C. CARFAGNA, Institute of Chemistry and Technology of Polymers - National Research Council of Italy, Pozzuoli (NA), Italy

10.30 *D-1:IL13* **Additive Colour Mixing on Textiles with Liquid Crystal Dye Systems**
S. ROBERTSON, R. CHRISTIE, W. IBRAHIM, Heriot-Watt University, Galashiels, Scotland

11.00 *Break*

Session D-2 - e-textiles

Chair: Kap Jin KIM, Korea

11.30 *D-2:IL01* **An Elastomeric Ionic Hydrogel Sensor for Large Strains**
P. MANANDHAR, **P. CALVERT**, J.R. BUCK, University of Massachusetts Dartmouth, North Dartmouth, MA, USA

12.00 *D-2:L03* **The Power Conversion Characteristics of Woven Organic Photovoltaic Wire Fabrics**
A. AGRAWAL, **YONG K. KIM**, P. CALVERT, Bioengineering Department, University of Massachusetts-Dartmouth, North Dartmouth, MA, USA; M. LEE, Konarka Technology Inc., Lowell, MA, USA

12.20 *D-2:L04* **Textile Sensor Applications with Composite Monofilaments of Polymer / Carbon Nanotubes**
A. FERREIRA, **F. FERREIRA**, Department of Textile Engineering, M.C. PAIVA, Department of Polymer Engineering, University of Minho, Portugal

12.40 *D-2:L05* **Feasibility of Printing Woven Humidity and Temperature Sensors for Integration into Electronic Textiles**
T. KINKELDEI, G. TRÖSTER, Eidgenössische Technische Hochschule Zürich (ETHZ), Electronics Laboratory, Zurich, Switzerland; C. ATAMAN, G. MATTANA, F. MOLINA LOPEZ, D. BRIAND, N.F. DE ROOIJ, Ecole Polytechnique Fédérale de Lausanne (EPFL), Institute of Microengineering (IMT), Sensors, Actuators and Microsystems Laboratory (SAMLAB), Neuchâtel, Switzerland; D. LEUENBERGER, G. NISATO, Centre Suisse d'Electronique et de Microtechnique SA (CSEM SA), Muttenz, Switzerland

Room: **SIRIO**

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

Chair: Masayoshi ESASHI, Japan

8.30 *E-2:IL04* **Stimuli Responsive Materials and Next Generation Chemical Sensors**
D. DIAMOND, CLARITY Centre for Sensor Web Technologies, National Centre for Sensor research, Dublin City University, Dublin, Ireland

9.00 *E-2:IL05* **Micro and Nanocantilevers: Technology and Application**
P. DATSKOS, Oak Ridge National Laboratory, Oak Ridge, TN, USA

9.30 *E-2:L06* **Novel Plasmonic Bio-sensing System Based on Two-dimensional Gold Patch Arrays for Linear and Nonlinear Regimes**
M. GRANDE[1], M.A. VINCENTI[2], T. STOMEO[3], G. MOREA[1], R. MARANI[1], V. MARROCCO[1, 5], V. PETRUZZELLI[1], A. D'ORAZIO[1], M. DE VITTORIO[3, 4], D. DE CEGLIA[2], M. SCALORA[6]; [1]Dipartimento di Elettrotecnica ed Elettronica, Politecnico di Bari, Bari, Italy; [2]AEgis Technologies Inc., Huntsville, AL, USA; [3]Italian Institute of Technology (IIT), Center for Bio-Molecular Nanotechnology, Arnesano (Lecce), Italy; [4]National Nanotechnology Laboratory (NNL), CNR-Istituto di Nanoscienze, Dip. Ingegneria dell'Innovazione, Università Del Salento, Lecce, Italy; [5]Istituto di Tecnologie Industriali ed Automazione ITIA-CNR, Bari, taly; [6]Charles M. Bowden Research Center, RDECOM, Redstone Arsenal, AL, USA

9.50 *E-2:L07* **Fabrication of Gas Sensing Devices from Nanowires: Techniques and Integration**
R. JIMÉNEZ-DÍAZ[1], J.D. PRADES[1], F. HERNÁNDEZ-RAMÍREZ[2], J. SANTANDER[3], C. CALAZA[3], L. FONSECA[3], C. CANÉ[3], **A. ROMANO-RODRÍGUEZ**[1], [1]MIND-IN2UB, Departament d'Electrònica, Universitat de Barcelona (UB), Barcelona, Spain; [2]IREC, Catalonia Institute for Energy Research, Barcelona, and Departament d'Electrònica, Universitat de Barcelona (UB), Barcelona, Spain; [3]Institut de Microelectrònica de Barcelona, IMB-CNM-CSIC, Bellaterra, Spain

10.10 *E-2:L08* **Wafer-level Fabrication and Gas Sensing Properties of Miniaturized Gas Sensors Based on Inductively Coupled Plasma Deposited Tin Oxide Nanorods**
A. FORLEO, L. FRANCIOSO, S. CAPONE, F. CASINO, P. SICILIANO, CNR-Istituto per la Microelettronica ed i Microsistemi,via Monteroni, Lecce, Italy; H. HUANG, O.K. TAN, Sensors and Actuators Lab, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

10.30 *Break*

continued on next page

Session E-5 - Radio Frequency MEMS

Chair: Kazuo SATO, Japan

11.00 *E-5:IL01* **Reliability of RF MEMS**
W.M. VAN SPENGEN, TU Delft / Falco Systems, Delft, The Netherlands

11.30 *E-5:IL02* **RF-MEMS Components and Networks for High-performance Reconfigurable Telecommunication and Wireless Systems**
J. IANNACCI, Fondazione Bruno Kessler - FBK, Center for Materials and Microsystems - CMM, MEMS Research Unit, Povo, Trento, Italy

12.00 *E-5:IL03* **Integrated Microsystems**
M. ESASHI, S. TANAKA, Tohoku University, Sendai, Japan

Session E-8 - Flexible MEMS Technology

12.30 *E-8:IL03* **The Potential and Challenges of Printing Sensors and MEMS on Flexible Foil**
D. BRIAND, F. MOLINA LOPEZ, A. VASQUEZ QUINTERO, G. MATTANA, N.F. DE ROOIJ, Ecole Polytechnique Fédérale de Lausanne (EPFL), Institute of Microengineering (IMT), Sensors, Actuators and Microsystems Laboratory (SAMLAB), Neuchâtel, Switzerland

Room: **GIOVE**

Session F-1 - Nanophotonics and Smart Optical Nanostructures

Chair: Noriaki TOYODA, Japan

8.30 *F-1:IL09* **Towards Three-dimensional Isotropic Metamaterials**
T. TANAKA, RIKEN Metamaterials Laboratory, Wako, Saitama, Japan

9.00 *F-1:IL10* **THz Switchable Metamaterials**
H.-T. CHEN, A.K. AZAD, J.F. O'HARA, R. SINGH, J. ZHOU, M.T. REITEN, D.R. CHOWDHURY, L. HUANG, S. RAMANI, Q. JIA, S.A. TRUGMAN, **A.J. TAYLOR**, Materials Physics and Applications Division, Los Alamos National Laboratory, Los Alamos, NM, USA

9.30 *F-1:L11* **Controlling Plasmonic Coupling: Highly Organized Structures for Biodiagnosis**
N. PAZOS-PEREZ, A. FERY, Department of Physical Chemistry II, University of Bayreuth, Bayreuth, Germany; R. ÁLVAREZ-PUEBLA, Department of Physical Chemistry, University of Vigo, Vigo, Spain

9.50 *F-1:L12* **Surface Topography Effect on Plasmonic Characteristics**
G.C. KING[1], H.-J. KIM[2], Y. PARK[2], K.D. SONG[3], S.H. CHOI[1], [1]NASA Langley Research Center, Hampton, VA, USA; [2]National Institute of Aerospace, Hampton, VA, USA; [3]Norfolk State University, Norfolk, VA, USA

10.10 *Break*

Session F-2 - Active and Responsive Optical Materials and Devices

Chair: Iam Choon KHOO, USA

10.40 *F-2:IL01* **Magnetic Properties of All-organic Nitroxide Radical Ferroelectric Liquid Crystals**
R. TAMURA, Kyoto University, Kyoto, Japan

11.10 *F-2:IL02* **Raman Gain in Nanostructured and Nanocomposites Materials**
L. SIRLETO[1], M.A. FERRARA[1], I. RENDINA[1], G.C. RIGHINI[2], [1]National Research Council (CNR) Istituto per la Microelettronica e Microsistemi, Napoli, Italy; [2]National Research Council (CNR) Istituto di Fisica Applicata Nello Carrara, Sesto Fiorentino, Italy

11.40 *F-2:IL03* **Flying with Optical Lift**
G.A. SWARTZLANDER, Center for Imaging Science & Dept. of Physics Rochester Institute of Technology, Rochester, NY, USA

12.10 *F-2:L05* **Spodumene Used as Thermoluminescent Dosimeter for High Doses**
R.A.P.O. D'AMORIM, **S.O. SOUZA**, Physics Department, Federal University of Sergipe, São Cristóvão, SE, Brazil

Session G-2 - Integration Technologies

Room: **LE PLEIADI**

Chairs: José RODELLAR, Spain / Tsu T. SOONG, USA

8.30 *G-2:IL01* **Actuator & Sensor Integration for Adaptronic Applications**
THILO BEIN, Fraunhofer LBF, Darmstadt, Germany

9.00 *G-2:IL02* **Digital Implementation for Active Control**
L. FARAVELLI, ZHICONG CHEN, Dept. Structural Mechanics, University of Pavia, Pavia, Italy

9.30 *G-2:IL03* **A Mathematical Framework for Structural Control Integration**
F. PALACIOS-QUINONERO, **J. RODELLAR**, J.M. ROSSELL, J. RUBIÓ-MASSEGÚ, Department of Applied Mathematics III, Universitat Politecnica de Catalunya, Barcelona, Spain

10.00 *G-2:IL04* **Dynamic Sensor Data Fusion: Developments for Structural and Mechanical Systems using Dual State Parameter Estimation Techniques**
A. SMYTH, Dept. of Civil Engineering & Engineering Mechanics, Columbia University, New York, NY, USA; E. CHATZI, ETH, Zurich, Switzerland

10.30 *Break*

11.00 *G-2:IL05* **Insight and Applications in Energy Harvesting from Bullets to Birds**
E. GARCIA, Laboratory of Intelligent Machine Systems, Cornell University, Ithaca, NY, USA

11.30 *G-2:IL06* **Design of Energy-harvesting and Storage Systems (EHSS) for Future Aero-vehicles**
M. TAYA, Center for Intelligent Materials and Systems, Boeing-Pennell Professor, Department of Mechanical Engineering, University of Washington, Seattle, WA, USA

12.00 *G-2:L07* **A Fractal-inspired Multi-frequency Piezoelectric Energy Converter: Computational and Experimental Characterization**
D. CASTAGNETTI, Dept. of Engineering Sciences and Methods, University of Modena and Reggio Emilia, Reggio Emilia, Italy

12.20 *G-2:L09* **Vibroacoustic Optimization and Implementation of Adaptive Metacomposite Based on Periodically Distributed Shunted Piezoelectric Patches**
F. TATEO, M. COLLET, M. OUISSE, FEMTO-ST Applied Mechanics, Besançon, France; M. ICHCHOU, LTDS Ecole Centrale de Lyon, Ecully, France

Room: **SMERALDO 2**

Session H-2.1 - Bioinspired and Bioenabled Materials and Manufacturing

Chair: Stanislav GORB, Germany

9.00 *H-2.1:IL01* **Shape-preserving Chemical Transformation of 3-D Biogenic and Synthetic Templates**
K.H. SANDHAGE, J.P. VERNON, J.D. BERRIGAN, S.C. DAVIS, M.-K. SONG, Y. FANG, Y. CAI, M. LIU, S.R. MARDER, N. KROGER, Georgia Institute of Technology, Atlanta, GA, USA

9.30 *H-2.1:IL02* **Materials Inspired by Nature: Design and Fabrication of Biocomposites from Cellulose Nanofibers**
QI ZHOU, V. BULONE, School of Biotechnology, Royal Institute of Technology, AlbaNova University Centre, Stockholm, Sweden; H. SEHAQUI, L.A. BERGLUND, Wallenberg Wood Science Center, Royal Institute of Technology, Stockholm, Sweden

10.00 *H-2.1:L11* **Mimicking the Anisotropic Behavior of Natural Porous Structures by Controlling the Reinforcing Particles Distribution in Polymeric Foams**
L. SORRENTINO, M. AURILIA, M. D'AURIA, S. IANNACE, CNR - Institute for Composite and Biomedical Materials, Portici (NA), Italy; D. DAVINO, P. MEI, C. VISONE, University of Sannio, Department of Engineering, Benevento (BN), Italy

10.20 *H-2.1:L12* **Templated Mineral Growth - A Pathway to Synthetic Nacre Biomineralisation**
N.H. MUNRO, **K.M. McGRATH**, The MacDiarmid Inst. for Advanced Materials and Nanotechnology, School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand

10.40 *H-2.1:L16* **Novel Interpenetrating Nylon-acrylic Polymer Composite Thin Films: Towards Improving Nylon's Resistance to Water**
A. ATTANASIO[1], I.S. BAYER[1], A. ATHANASSIOU[1, 2], R. CINGOLANI[2], [1]Center for Bio-Molecular Nanotechnology@Unile, Istituto Italiano di Tecnologia (IIT), Arnesano (Lecce), Italy; [2]Istituto Italiano di Tecnologia (IIT), Central Research Laboratories, Genova, Italy

11.00 *Break*

Session H-1 - Algorithms, Mechanisms and Structures in Nature as an Inspiration for Mimicking

Chair: Sylvain MARTEL, Canada

11.30 *H-1:IL07* **Hydro-actuated Plant Organs as Prototypes for Convertible Devices**
I. BURGERT, ETH Zurich, Institute for Building Materials & Empa, Zurich, Switzerland; M.J. HARRINGTON, K. RAZGHANDI, M. EDER, J. W.C DUNLOP, P. FRATZL, Max Planck Institute of Colloids and Interfaces, Dept. of Biomaterials, Potsdam, Germany; C. NEINHUIS, Institute for Botany, TU Dresden, Dresden, Germany

12.00 *H-1:IL09* **Innovative Biomimetic Materials Inspired by Plants**
R. SEIDEL, T. MASSELTER, O. SPECK, T. SPECK, Plant Biomechanics Group Freiburg, Botanic Garden, Faculty of Biology, University of Freiburg, Freiburg, Germany; Bionics Competence Network BIOKON e.V.; Competence Network Biomimetics

Special Session H-7 - Biomimetic Flow Control in Aquatic and Aerial Systems and its Application to Bioinspired Autonomous Vehicles

Room: **AMBRA**

Chair: Luca SCHENATO, Italy *(Programme Chair)*

10.55 *Welcome by Programme Chair*

11.00 *H-7:IL01* **Influence of Flexibility on Flapping Wing Performance**
B. BALACHANDRAN, Department of Mechanical Engineering, University of Maryland, College Park, MD, USA

11.30 *H-7:IL02* **Controlling Flow Structures by Wing Motion in a Flapping-flight Model**
M. IIMA, Hiroshima University, Higashi-Hiroshima, Japan

12.00 *H-7:IL03* **Numerical Simulations of the Clap-fling-sweep of Hovering Insects**
K. SCHNEIDER, Aix-Marseille University, Marseille cedex, France; D. KOLOMENSKIY, Cerfacs, Toulouse, France; TH. ENGELS, Aix-Marseille University, France & TU Berlin, Germany; K. MOFFATT, Trinity College, Cambridge, UK; M. FARGE, Ecole Normale Superieure, Paris, France

Session I-1 - Sensor Technology

Room: **TURCHESE**

Chair: Kwang Suk PARK, Korea

9.30 *I-1:IL05* **Biocompatible Chip and System Packaging for Implantable Applications**
M. OP DE BEECK, K. QIAN, J. O'CALLAGHAN, K. MALACHOWSKI, C. VAN HOOF, Imec, Leuven, Belgium

10.00 *I-1:IL06* **Chip-level Electronic Noses for Breath Analysis**
M. CREGO-CALAMA, S.H. BRONGERSMA, D. KARABACAK, Holst Centre/ imec the Netherlands, Eindhoven, The Netherlands

10.30 *I-1:L08* **Micro-fluidic Device for Colorimetric Analysis of Sweat**
V.F. CURTO, C. FAY, S. COYLE, D. DIAMOND, F. BENITO-LOPEZ, Clarity: Centre for Sensor Web Technologies, National Centre for Sensor Research, Dublin City University, Dublin, Ireland

10.50 *Break*

Session I-2 - Smart Fabrics and Wearables

Chair: Danilo DE ROSSI, Italy

11.20 *I-2:IL05* **Real-time Analysis of Sweat using Integrated Chemical Sensors**
C. COYLE, F. BENITO-LOPEZ, V. CURTO, R. BYRNE, D. DIAMOND, Dublin City University, Dublin, Ireland

11.50 *I-2:IL06* **MICROFLEX Project - Microtechnology in Smart Fabrics**
S.P. BEEBY, M.J. TUDOR, R.N. TORAH, K. YANG, Y. WEI, University of Southampton, Southampton,UK

Room: **SMERALDO 3**

Session J-1 - Active and Stimuli Responsive Biomaterials

Chair: Atsushi MARUYAMA, Japan

9.00 *J-1:IL06* **Engineering Synthetic Hydrogels as Functional Stem Cell Microenvironments**
M.P. LUTOLF, Institute of Bioengineering, EPF Lausanne, Switzerland

9.30 *J-1:L07* **Responsive Janus Hydrogels**
SUNAE HWANG, SONA LEE, **JONGHWI LEE**, Chung-Ang University, Seoul, South Korea

9.50 *J-1:IL09* **Nanomaterials Improve Cellular Interactions for Medical Implants**
HUINAN LIU, Dept. of Bioengineering, the Materials Science and Engineering Program, and the Stem Cell Center, University of California, Riverside, Riverside, CA, USA

10.20 *Break*

Session J-2 - Enabling Tools

Chair: Vladimir P. TORCHILIN, USA

10.50 *J-2:IL01* **FluidFM: A Force-controlled Nanosyringe for Single-cell Studies and More**
T. ZAMBELLI, Laboratory of Biosensors and Bioelectronics, ETH Zurich, Switzerland

11.20 *J-2:IL02* **Microfluidic Devices for Cancer Cell Capturing**
B. THIERRY, Ian Wark Research Institute, University of South Australia, Mawson Lakes, SA, Australia

11.50 *J-2:IL03* **New Methods of Bioanalysis using Functionalised Nanoparticles and SERS**
D. GRAHAM, University of Strathclyde, Glasgow, UK

12.20 *J-2:IL04* **Metallic and Composite Functionalized Plasmonic Nanoparticles for Biomedical Applications**
N. KHLEBTSOV, B. KHLEBTSOV, E. PANFILOVA, V. KHANADEEV, V. BOGATYREV, L. DYKMAN, Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia; G. TERENTYUK, I. MAKSIMOVA, E. TUCHINA, V. TUCHIN, Saratov State University, Russia

Session A-1.1 - Electroceramics

Room: **VENERE**

Chair: Marcelo J. DAPINO, USA

15.30 *A-1.1:IL11* **Flexoelectric Materials, Structures and Sensing Applications**
XIAONING JIANG, North Carolina State University, Raleigh, NC, USA

16.00 *A-1.1:IL12* **Integrated Piezoelectrics for Adaptive Microsystems - Teamwork of Substrate and Piezo**
S. GEBHARDT, Fraunhofer Institute for Ceramic Technologies and Systems, Dresden, Germany

16.30 Break

Chair: Sylvia GEBHARDT, Germany

17.00 *A-1.1:IL13* **Dielectric Anisotropy as an Additional Tunability of Ferroelectric Based Composites**
M. MAGLIONE, **C. ELISSALDE**, D. BERNARD, U.C. CHUNG, ICMCB-CNRS, Université Bordeaux I, Pessac, France; C. ESTOURNES- CIRIMAT et Plateforme Nationale CNRS de Frittage Flash, PNF2 MHT, Université Paul Sabatier, Toulouse, France

17.30 *A-1.1:L22* **Rewritable Magnetic Patterning and its Application Based on Hydrogen Mediated Ferromagnetism**
SEUNGHUN LEE, WON-KYUNG KIM, JI-HUN PARK, YONG CHAN CHO, H. KOINUMA, SE-YOUNG JEONG, Dept. of Cogno-mechatronics Engineering, Pusan National University, South Korea

18.00 *A-1.1:L23* **Structure and Properties of High-pressure-manufactured MgB_2-based Superconductors for Smart Applications**
T.A. PRIKHNA[a], W. GAWALEK [b], V.E. MOSHCHIL[a], V. SOKOLOVSKY[c], M. EISTERER[d], H.W. WEBER[d], J. NOUDEM[e], X. CHAUD[f], A. KOZYREV[a], M.V. KARPETS[a,g], V.V. KOVYLAEV[g], S.N. DUB[a], V.B. SVERDUN[a], [a]Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine; [b]Institut für Photonische Technologien, Jena, Germany; [c]Ben-Gurion University of the Negev, Beer-Sheva, Israel; [d]Atominstitut, Vienna University of Technology, Vienna, Austria; [e]CNRS/CRISMAT/ISMRA, NRS UMR 6508, Caen, France; [f] CNRS/CRETA, Grenoble Cedex, France; [g]Institute for Problems in Material Science of the National Academy of Sciences of Ukraine, Kiev, Ukraine

Room: **AUDITORIUM**

Session A-6.2 - Functional Porous Materials

Chair: Paolo FALCARO, Australia

15.00 *A-6.2:IL07* **Optically and Electrically Responsive Periodic Mesoporous Organosilicas**
S. INAGAKI, Toyota Central R&D Labs., Inc., Nagakute, Aichi, Japan

15.30 *A-6.2:L08* **Dynamic Cavity Response in Adaptive Porous Materials**
C.M. DOHERTY, P. FALCARO, A.J. HILL, CSIRO Materials Science and Engineering, Melbourne, Victoria, Australia

15.50 *A-6.2:L10* **Synergic Photocatalyst of Mesoporous Silica for Environ-mental Purification**
J. HOJO, M. INADA, Department of Applied Chemistry, Faculty of Engineering, Kyushu University, Fukuoka, Japan

16.10 *A-6.2:L11* **Magnetoactive Superhydrophobic Foams for Oil-water Separation**
P. CALCAGNILE[1], D. FRAGOULI[1], I.S. BAYER[1], G.C. ANYFANTIS[1], R. CINGOLANI[2], A. ATHANASSIOU[1, 2], [1]Center for Biomolecular Nanotechnologies (CBN) - Istituto Italiano di Tecnologia (IIT)@UniLe, Arnesano (LE), Italy; [2]Istituto Italiano di Tecnologia (IIT), Genova, Italy

16.30 *A-6.2:L12* **Highly Porous Polymeric Foam of Maleimide-Termiated Poly(arylene ether sulfone) Oligomers via High Internal Phase Emulsions**
K. THANAMONGKOLLIT, P. MALAKUL, M. NITHITANAKUL, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand; **P. PAKEYANGKOON**, Dept. of Mechanical Engineering Technology, College of Industrial Technology, King Mongkut's University of Technology North Bangkok, Bangkok, Thailand

16.50 *Break*

continued on next page

Chair: Anselm GRIFFIN, USA

Session A-6.1 - Multifunctional Materials, Hybrids and Nanocomposites

17.20 *A-6.1:L13* **Superhydrophilic and Superhydrophobic Patterned Surfaces**
M.B. HERZOG, J.H. JOHNSTON, School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand

17.40 *A-6.1:L14* **High Dielectric Nanocomposite Interleaves for Multifunctional Structural Composites**
G.J. EHLERT[1], H. TANG[2], A. HAREL-CANADA[1], **H.A. SODANO**[1], [1]Mechanical and Aerospace Engineering, University of Florida, Gainesville, FL, USA; [2]Materials Science & Engineering, University of Florida, Gainesville, FL, USA

18.00 *A-6.1:L15* **Nanogold and Nanosilver Hybrid Materials with Paper Fibres for Anti-microbial Applications**
T.W. NILSSON, J.H. JOHNSTON, School of Chemical and Physical Sciences, MacDiarmid Institute for Advanced Materials and Nanotechnology, Victoria University of Wellington, Wellington, New Zealand

Session A-7 - Smart Molecular and Sopramolecular Systems, Metallorganic Frameworks and Coordination Polymers

18.20 *A-7:IL01* **Combining Metal Organic Frameworks with Functional Micro- and Nano-particles**
P. FALCARO, D. BUSO, A.J. HILL, CSIRO, Division of Materials Science and Engineering, Clayton South MDC, Victoria, Australia

Room: **ORSA MAGGIORE**

Session A-12.2 - Photonic, Nanophotonic, Plasmonic and Infrared Metamaterials

Chair: Lei ZHOU, China

15.30 *A-12.2:IL09* **Controlling Radiation Using Dark Plasmon Modes**
N.X. FANG, KIN HUNG FUNG, A. KUMAR, JUN XU, Massachusetts Institute of Technology, Cambridge, MA, USA

16.00 *A-12.2:L11* **Ferromagnetism in Cr Doped Indium Oxide for Homogeneous Negative Index Materials**
A. AKYURTLU, A.-G. KUSSOW, Electrical and Computer Engineering Department, University of Massachusetts Lowell, MA, USA

16.20 *A-12.2:L12* **Strong Coupling Effects in Fabricated Tunable Layers of Metal Nanoparticles**
S. MÜHLIG, C. ROCKSTUHL, F. LEDERER, Institute of Condensed Matter Theory and Solid State Optics, Abbe Center of Photonics, Friedrich-Schiller-Universität Jena, Jena, Germany; A. CUNNINGHAM, T. BÜRGI, Département de Chimie Physique, Université de Geneve, Geneva, Switzerland; D. CIALLA, K. WEBER, Institute of Physical Chemistry, Friedrich-Schiller-Universität Jena, Jena, Germany

16.40 *Break*

Session A-12.4 - Cloaking, Transformation Optics, Antennas, Superlenses

Chair: Nicholas X. FANG, USA

17.10 *A-12.4:IL02* **Transformation Electromagnetics**
M. McCALL, Imperial College, London, UK

17.40 *A-12.4:L03* **Double-negative Negative Index Metamaterial Composed of a Silver Nanowires Structure at Visible Light Spectrum**
YONGXIANG ZHAO[1], **FEI CHEN**[1, 2], QIANG SHEN[1], LING LI[1], XIAOGUI WANG[1], ZHIXIONG HUANG[2], LIANMENG ZHANG[1, 2], [1]State Key Lab of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, China; [2]Key Laboratory of Advanced Technology for Specially Functional Materials, Ministry of Education, Wuhan University of Technology, Wuhan, China

18.00 *A-12.4:L04* **Trapped Rainbow Techniques for Spectroscopy on a Chip and Fluorescence Enhancement**
V.N. SMOLYANINOVA[1], I.I. SMOLYANINOV[2], A.V. KILDISHEV[3], V.M. SHALAEV[3], [1]Department of Physics Astronomy and Geosciences, Towson University, Towson, MD, USA; [2]Department of Electrical and Computer Engineering, University of Maryland, College Park, MD, USA; [3]Birck Nanotechnology Centre, School of Electrical and Computer Engineering, Purdue University, IN, USA

Session A-13.2 - Electronic and Optional Properties

Room: **ORSA MINORE**

Chair: Vincenzo PALERMO, Italy

15.00 *A-13.2:IL04* **Chemical Potential Jumps, Bistability, and Electron-plasmon Interactions in Bernal-stacked Bilayer Graphene**
M. POLINI, NEST, Istituto Nanoscienze-CNR and Scuola Normale Superiore, Pisa, Italy

15.30 *A-13.2:IL05* **Band Gap Opening by B and N Co-doping in Graphene**
CHUN-CHIANG KUO[1], JEONG-YUAN HWANG[2], LI-CHYONG CHEN[2], **KUEI-HSIEN CHEN**[1, 2], [1]Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan; [2]Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan

16.00 *A-13.2:IL06* **Inhomogenous Electronic Structure and Transport Gap in Disordered Bilayer Graphene**
E. ROSSI, Department of Physics, College of William and Mary, Williamsburg, VA, USA

16.30 *A-13.2:L07* **On the Possibility of Ultra-low Power Switching in Multilayer Graphene Nanostructures**
B. DELLABETTA, Micro and Nanotechnology Laboratory, University of Illinois, Urbana, IL, USA; J. SHUMWAY, Department of Physics, Arizona State University, Tempe, AZ, USA; **M.J. GILBERT**, Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, USA

Room: **ZENITH**

Session A-14.2 - Smart Materials for Self-power Generators

Chair: Daniel GUYOMAR, France

15.00 *A-14.2:IL06* **Epitaxial Pb(Zr,Ti)O3 on Silicon for Energy Harvesting Devices**
A. SAMBRI[1], S. GARIGLIO[2], D. ISARAKORN[3], D. BRIAND[3], A. TORRES PARDO[4], J.W. REINER[5], C.H. AHN[5], J.-M. TRISCONE[2], [1]Dipartimento di Scienze Fisiche & CNR-SPIN, Università degli Studi di Napoli Federico II, Napoli, Italy; [2]Department of Condensed Matter Physics (DPMC), University of Geneva, Geneva, Switzerland; [3]Ecole Polytechnique Fédérale de Lausanne (EPFL), SAMLAB, Switzerland; [4]Laboratoire de Physique des Solides, Université Paris-Sud, CNRS-UMR 8502, Orsay, France; [5]Department of Applied Physics, Yale University, New Haven, Connecticut, USA

15.30 *A-14.2:IL07* **ZnO Nanowires for Energy Harvesting and Piezotronics**
ZHONG LIN WANG, School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA, USA

16.00 *A-14.2:IL08* **Highly Efficient, Flexible Thin Film Nanogenerator**
KEON JAE LEE, Department of Materials Science and Engineering, KAIST, Daejeon, Korea

16.30 *A-14.2:L10* **The Synthesis of In-Se by Vapor Transport Method**
N. TAKANO, Graduate School, Kogakuin University, Hachioji, Tokyo, Japan; H. KOHRI, T. YAGASAKI, Faculty of Engineering, Kogakuin University, Tokyo, Japan

16.50 *A-14.2:L11* **Piezoelectric Properties of Crystallized PZT Thin Films on Flexible Substrate for Energy Harvesting**
CHONG-YUN KANG, MIN-GYU KANG, YOUNG-HO DO, SEUNG-MIN OH, SAHN NAHM, SEOK-JIN YOON, Electronic Materials Center, Korea Institute of Science and Technology, Seoul, Korea; Department of Materials Science and engineering, Korea University, Seoul, Korea

17.10 *A-14.2:L12* **Hybrid Photovoltaic-piezoelectric Flexible Device for Energy Harvesting from Nature**
D. VATANSEVER, R.L. HADIMANI, **T. SHAH**, E. SIORES, Institute for Materials Research and Innovation, University of Bolton, Bolton, UK

17.30 *Break*

continued on next page

Chair: Yoon-Bong HAHN, Korea

Session A-14.3 - Interfacial Characterization

18.00 *A-14.3:IL01* **Interfacial and Electrical Properties of Reliable p-TiO2 for Optoelectronic Devices Application**
S. DAS, D. LIU, **YOON-BONG HAHN**, School of Semiconductor and Chemical Engineering, WCU Department of BIN Fusion Technology, Chonbuk National University, South Korea

18.30 *A-14.3:L02* **Graphene Composite Materials for Supercapacitor Electrodes**
J. LAKE, Z. TANAKA, **BIN CHEN**, NASA Ames Research Center, Moffett Field, CA, USA; Dept. of Mechanical Engineering, Columbia University, NY, USA; Dept. of Electrical Engineering, University of California, CA, USA

Session A-14.1 - Smart Materials for High Efficiency Solar Cells

18.50 *A-14.1:L03* **Cobalt Doped ZnO Nanorods Fabricated by Chemical Bath Deposition Technique**
P. HARI[1], J. SEAY[1], K. FARMER[2], K.P. ROBERTS[2], [1]Department of Physics, University of Tulsa, Tulsa, OK, USA; [2]Department of Chemistry, University of Tulsa, Tulsa, OK, USA

Room: **SIRIO**

Session A-15.2 - Shape Changing Polymers

Chair: Duncan J. MAITLAND, USA

15.00 *A-15.2:IL01* **A Continous Flow Synthesis of Micrometer Sized Actuators from Liquid Crystalline Elastomers**
E. FLEISCHMANN, C. OHM, **R. ZENTEL**, Chemistry, University of Mainz, Mainz, Germany

15.30 *A-15.2:IL02* **Thermosensitive Helical Shape of Twist Nematic Elastomer Ribbons**
K. URAYAMA, Department of Materials Chemistry, Kyoto University, Kyoto, Japan

16.00 *A-15.2:L03* **Electro-actuation of Responsive Polyelectrolyte Hydrogel: Role of pH Propagating Front**
P.J. GLAZER, A. EMBRECHTS, E. MENDES, Chemical Engineering, Delft University of Technology, The Netherlands; S.G. LEMAY, MESA+ Institute for Nanotechnology, University of Twente, The Netherlands

16.20 *A-15.2:L04* **Plasma Treatment of LCE Affects Thermal Properties of Shape-changing Materials**
C. MELCHERT, M. BEHL, A. LENDLEIN, Center for Biomaterial Development, Institute of Polymer Research, Helmholtz-Zentrum Geesthacht, Teltow, Germany

16.40 *A-15.2:L05* **Shape Memory Polymer Systems with Independent Control of Material Properties Before and After Deployment**
C.N. BOWMAN, D.P. NAIR, N.B. CRAMER, J.C. GAIPA, R. SHANDAS,University of Colorado, Boulder, CO, USA

17.00 *Break*

Session A-15.5 - Degradable, Stimuli-sensitive Polymers

Chair: Timothy J. WHITE, USA

17.30 *A-15.5:IL01* **Redox-responsive Degradation of Poly(ethylene glycol) (PEG) Based Cryogels**
F. DU PREZ, T. DISPINAR, L. DE COCK, B. DE GEEST, Polymer Chemistry Research Group, Ghent University, Ghent, Belgium; Laboratory of Pharmaceutical Technology, Dept. of Pharmaceutics, Ghent University, Ghent, Belgium

18.00 *A-15.5:IL02* **Biodegradable Shape Memory Polymeric Composites**
LIN WANG, HONGMEI CHEN, **SHAOBING ZHOU**, School of Materials Science and Engineering, Key Lab. of Advanced Technologies of Materials, Ministry of Education, Southwest Jiaotong University, Chengdu, P.R. China

18.30 *A-15.5:IL03* **Smart Multifunctional Polymers from Polymerisation of Multi-vinyl Monomers**
WENXIN WANG, Science Foundation Ireland (SFI), Network of Excellence in Functional Biomaterials, National Centre for Biomedical Engineering Science, Department of Mechanical and Biomedical Engineering, National University of Ireland, Galway, Ireland

19.00 *A-15.5:L04* **Tailoring the Thermo-Mechanical Properties of Biodegradable Poly(beta-amino ester) Shape-Memory Polymers**
D.L. SAFRANSKI, K. GALL, Georgia Institute of Technology, Atlanta, GA, USA and MedShape Solutions, Atlanta, GA, USA; D. WEISS, W.R. TAYLOR, Emory University, Atlanta, GA, USA

Room: **SMERALDO 1**

Session B-3 - Engineering

Chair: Eduard CESARI, Spain

15.00 *B-3:IL01* **Thermodynamics of One-way Shape Memory Effect in Alloys under Complex Stress State**
B. RANIECKI, **A. ZIOLKOWSKI**, Institute of Fundamental Technological Research, Polish Academy of Sciences (IPPT, PAN), Warsaw, Poland

15.30 *B-3:IL02* **Shape Memory Alloys Foams**
A. TUISSI, P. BASSANI, C. BIFFI, CNR-IENI Lecco Consiglio Nazionale delle Ricerche, Istituto per l'Energetica e le Interfasi, Lecco, Italy

16.00 *B-3:IL03* **Fabrication of Nano-grained Shape Memory Alloys by Severe Plastic Deformation**
K. TSUCHIYA, Q. MEI, D. NOORFAZIDAH BINTI AWAN SHRI, A. YAMAMOTO, National Institute for Materials Science, Tsukuba, Japan

16.30 *B-3:IL05* **Deformation Processes Responsible for Heat Treatment, Shape Setting or Actuation Instability of NiTi**
P. SITTNER, J. PILCH, L. HELLER, Institute of Physics, Praha, Czech Republic; C. CURFS, ESRF, Grenoble, France

17.00 *Break*

Session B-2 - Phase Transformation and Microstructure

Chair: Vladimir BRAILOVSKI, Canada& Russia

17.30 *B-2:IL09* **Optimization of Smart Heusler Alloys from First Principles**
P. ENTEL, Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany

18.00 *B-2:IL10* **Highly Mobile Twin Boundary in Ni-Mn-Ga Magnetic Shape Memory Single Crystal**
O. HECZKO, Department of Functional Materials, Institute of Physics AS CR, Prague, Czech Republic

18.30 *B-2:L11* **Theoretical Study of Magnetic Properties and Twin Boundary Motion in Heusler Ni-Mn-X Shape Memory Alloys Using First Principles and Monte Carlo Method**
V.D. BUCHELNIKOV, V.V. SOKOLOVSKIY, M.A. ZAGREBIN, K.I. KOSTROMITIN, S.V. TASKAEV, Chelyabinsk State University, Chelyabinsk, Russia

18.50 *B-2:L12* **Isothermal Behaviour of the Martensitic Transformation in Ferromagnetic Shape Memory Alloys**
D. SALAS, S. KUSTOV, J. TORRENS-SERRA, **E. CESARI**, Dept. de Física, Universitat de les Illes Balears, Palma de Mallorca, Spain; J.I. PÉREZ-LANDAZÁBAL, V. RECARTE, V. SÁNCHEZ-ALARCOS, Depto. de Física, Universidad Pública de Navarra, Campus de Arrosadía, Pamplona, Spain

Session C-2 - Analysis and Physical Mechanisms

Room: **URANO**

Chair: Toribio F. OTERO, Spain

15.30 *C-2:IL01* **Visualizing Actuation Mechanisms in Conducting Polymers**
E. SMELA, University of Maryland, College Park, MD, USA

16.00 *C-2:IL02* **Modeling of Ionic Electroactive Polymers**
T. WALLMERSPERGER, Institut für Festkörpermechanik, TU Dresden, Germany

16.30 *Break*

17.00 *C-2:IL06* **Controlling Polymer Crystallization in Functional Nanostructures**
L. NOUGARET, H. KASSA, R, CAI, **A.M. JONAS**, Institute of Condensed Matter and Nanosciences, University of Louvain, Louvain-la-Neuve, Belgium

17.30 *C-2:IL07* **Interfacial Layer and its Role in Newly Developed High-performance Electroactive Polymers and Composites**
Z.-Y. CHENG, Materials Research and Education Center, Auburn University, Auburn, AL, USA

Room: **ALBA 2**

Session D-2 - e-textiles

Chair: Paul CALVERT, USA

15.00 *D-2:IL06* **Novel Fibers as Base Technology for Smart Textile Integration**
R. HUFENUS, S. GAAN, D. HEGEMANN, **M. HEUBERGER**, Empa, Advanced Fibers, Switzerland

15.30 *D-2:IL07* **Innovative Smart Materials for Wearable Electronics**
R. PERERA, EY Technologies, Division of Pascale Industries, Inc., Fall River, MA, USA

16.00 *D-2:L08* **Novel Flexible Sensors for Smart Clothing to Monitor Vital Signals and Energy Expenditure**
KAP JIN KIM, YU JIN AHN, SUN YOON, Kyung Hee University, College of Engineering, Yongin-si, Gyeonggi-do, South Korea

16.20 *D-2:L09* **Conformable Textile Electronics Comprising Foil Based, Organic Components**
K. PACHECO, **M. DE KOK**, J. VAN DEN BRAND, G. VAN HECK, Holst Centre /TNO, Eindhoven, The Netherlands

16.40 *D-2:L10* **Essential Building Blocks of Fibrous Transistors, Part I: Gate Layer**
L. RAMBAUSEK[1], A. SCHWARZ[1], B. VAN GENABET[1], E. BRUNEEL[2], I. VAN DRIESSCHE[2], L. VAN LANGENHOVE[1], [1]Ghent University, Department of Textiles, Ghent/Zwijnaarde, Belgium; [2]Ghent University, Department of Inorganic and Physical Chemistry, Ghent, Belgium

17.00 *Break*

Session D-1 - Adaptive/Active Textiles

Chair: Jinlian HU, Hong Kong

17.30 *D-1:L14* **Halochromic Textile Materials as Innovative pH-sensors**
L. VAN DER SCHUEREN, K. DE CLERCK, Ghent University, Department of Textiles, Zwijnaarde (Ghent), Belgium

17.50 *D-1:L16* **Integration of Small Diameter Wire form SMA for the Creation of Dynamic Shape Memory Textiles**
P. DYER, University of Brighton, Brighton, UK

Room: **GIOVE**

Session F-2 - Active and Responsive Optical Materials and Devices

Chair: Sang H. CHOI, USA

15.00 *F-2:IL06* **Liquid-crystals-plasmonic (LCP) Nanostructures for Advanced Electro- and Nonlinear Optics**
I.C. KHOO, Electrical Engineering Department, Pennsylvania State University, University Park, PA, USA

15.30 *F-2:IL07* **White Light Generation in Rare-earth-doped Amorphous Films Produced by Ultrasonic Spray Pyrolysis**
R. MARTÍNEZ-MARTÍNEZ, Instituto de Física y Matemáticas, Universidad Tecnológica de la Mixteca, Huajuapan de León, Oaxaca, México; E. ÁLVAREZ, Departamento de Física, UNISON, Hermosillo, Sonora, México; A. SPEGHINI, DiSTeMeV, Università di Verona, and INSTM, UdR Verona, San Floriano, Verona, Italy; C. FALCONY, Departamento de Física, CINVESTAV-IPN, México, D.F., México; **U. CALDINO**, Departamento de Física, Universidad Autónoma Metropolitana-Iztapalapa, México, D.F., México

16.00 *F-2:IL08* **Linear and Nonlinear Optical Properties of Sol-gel-derived Microstructured Fibers Doped with Active Optical Ions and Metallic Nanoparticles**
L. BIGOT, H. EL HAMZAOUI, A. LE ROUGE, G. BOUWMANS, I. RAZDOBREEV, R. BERNARD, B. CAPOEN, **M. BOUAZAOUI**, Laboratory for Physics of Lasers, Atoms and Molecules (PHLAM/IRCICA - UMR8523/USR3380), CNRS - Lille 1 University, Villeneuve d'Ascq cedex, France

16.30 *F-2:L09* **Hybrid Organic-inorganic Photo-driven Nanoimpellers for Drug Release**
A. FRANCO, J. GARCÍA-MACEDO, J.I. ZINK, Departamento de Estado Sólido, Instituto de Física, Universidad Nacional Autónoma de México, México; Department of Chemistry and Biochemistry, University of California, Los Angeles, CA, USA

16.50 *F-2:L10* **ZnO-based Thin Film Double Heterostructured-ultraviolet Light-emitting Diodes Grown by Vapor Cooling Condensation Technique**
P.C. WU, C.T. LEE, Institute of Microelectronics, Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan, R.O.C.

17.10 *F-2:L11* **Morphology Control in Luminescent Cadmium Silicate-based Nanostructures**
L.P. SANTANA, E.S. ALMEIDA, J.L. SOARES, **F.M. VICHI**, Instituto de Quimica, Universidade de Sao Paulo, Sao Paulo, Brazil

17.30 *Break*

continued on next page

Session F-3 - Smart Optical Systems and Devices

Chair: Ulises CALDINO, Mexico

18.00 *F-3:IL02* **Purely Nonlinear Photonic Crystals**
K. GALLO, KTH - Royal Institute of Technology, Department of Applied Physics, Stockholm, Sweden

18.30 *F-3:L03* **Development of Field-controlled Smart Optic Materials (ScN, AlN) with Rare Earth Dopants**
H.J. KIM[1], Y. PARK[1], G.C. KING[2], S.H. CHOI[2], [1]National Institute of Aerospace, Hampton, VA, USA; [2]NASA Langley Research Center, Hampton, VA, USA

18.50 *F-3:L04* **Multimodal, High-resolution Imaging Systems Based on Stimuli-responsive Polymers**
G. PASCHEW, R. KÖRBITZ, A. RICHTER, Chair of Polymeric Microsystems, Dresden University of Technology, Dresden, Germany

Room: **LE PLEIADI**

Chair: Ying LEI / Hui LI, China

Session G-4 - Bio-inspired Materials and Structures

15.00 *G-4:IL02* **Mussel-inspired Technology for Microfluidics and Stem Cell Culture**
HAESHIN LEE, Graduate School of Nanoscience & Technology (WCU), KAIST, Daejeon, Korea

15.30 *G-4:IL04* **Mechanical Model of Bio-inspired Ultra-sensitive Infrasound Sensor for Landslide**
YING LEI[1], L.J. LIU[2], Y.F. ZHANG[3], Q. GU[1], [1]Department of Civil Engineering, Xiamen University, Xiamen, China; [2]Department of Mechanical and Electronic Engineering, Xiamen University, Xiamen, China; [3]Department of Civil and Environmental Engineering, Maryland University, Maryland, MD, USA

16.00 *G-4:IL07* **Learning from Plants – Biologically-inspired Adaptive Structural Systems**
K.W. WANG, Department of Mechanical Engineering, University of Michigan, Ann Arbor, MI, USA

Session G-3 - Smart Structures and Integrated Systems

16.30 *G-3:L13* **SHM System for Monitoring and Prediction of Cracks Development in Concrete Structures**
G. KNOR, J. HOLNICKI-SZULC, Institute of Fundamental Technological Research, Polish Academy of Sciences, Department of Intelligent Technologies, Warsaw, Poland

16.50 *G-3:L14* **The ELGRID System for Monitoring of Cracks in Massive Concrete Structures**
M. KOKOT, ADAPTRONICA, Lomianki, Poland; J. HOLNICKI-SZULC, IPPT PAN, Warsaw, Poland

17.10 *G-3:L16* **Smart Composite Device for Structural Health Monitoring**
A. CORICCIATI, P.A. CORVAGLIA, A. LARGO, Consorzio CETMA, Brindisi, Italy; M.A. CAPONERO, ENEA Frascati Research Centre, Frascati, Roma, Italy

17.30 *G-3:L18* **Real-time Smart Abstract Shape Identifiers**
M.H.M. HASSAN, Civil Engineering, British University in Egypt (BUE), Cairo, Egypt

17.50 *Break*

continued on next page

Session G-1 - Smart Materials, Sensors, Actuators

18.20 *G-1:L10* **On Characteristic Properties of a Layered Packet Base-foundation on the Base of the Analysis of the Solutions of the Corresponding Three-dimensional Dynamic Problems of Elasticity Theory**
L.A. AGHALOVYAN, M.L. AGHALOVYAN, Institute of Mechanics of NAS of Armenia, Yerevan, Armenia

18.40 *G-1:L11* **Advanced Smart Materials to Enable Adaptive Structural Composites**
M.R. MASCHMANN, G. EHLERT, A. McCLUNG, G.P. TANDON, D. PHILLIPS, R. JUSTICE, **J.W. BAUR**, Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RX, WPAFB, OH, USA

19.00 *G-1:L12* **Nonlinear Viscoelastic Model of Isotropic and Anisotropic Magnetorheological Elastomers**
K. SAPOUNA, Y.P. XIONG, R.A. SHENOI, Faculty of Engineering and the Environment, University of Southampton, Southampton, UK

Session H-2.1 - Bioinspired and Bioenabled Materials and Manufacturing

Room: **SMERALDO 2**

Chair: Alexander GOVOROV, USA

15.00 *H-2.1:IL04* **Bio-inspired Silk-based Materials**
T. SCHEIBEL, Lst. Biomaterialien (FAN) Universität Bayreuth, Bayreuth, Germany

15.30 *H-2.1:IL05* **Non-canonical Base Pairs in DNA Crystal Design**
P.J. PAUKSTELIS, University of Maryland, Department of Chemistry and Biochemistry Center for Biological Structure and Organization, College Park, MD, USA

16.00 *H-2.1:IL07* **Self-assembled Polymeric Supramolecular Frameworks**
O. IKKALA, N HOUBENOV, Helsinki Univ Tech/Aalto Univ, Espoo, Finland; H. IATROU, N. HADJICHSTIDIS, Univ. Athens, Athens, Greece; C. FAUL, Univ. Bristol, Bristol, UK

16.30 *Break*

Chair: Olli IKKALA, Finland

17.00 *H-2.1:IL07b* **Biomimetic ceramic and hybrid nanofibers**
YOU-LO HSIEH, University of California, Davis, CA, USA

17.30 *H-2.1:IL08* **Bio-inspired Chiral Nanostructures with Plasmon and Exciton Resonances**
A. GOVOROV, Department of Physics and Astronomy, Ohio University, Athens, OH, USA

18.00 *H-2.1:IL10* **Study Concerning 3D Collagen Grafts for Wound Dressing and Controlled Release**
M. CHIRITA, Faculty of Medical Bioengineering, University of Medicine and Pharmacy "Gr.T. Popa", Iasi, Romania

Special Session H-7 - Biomimetic Flow Control in Aquatic and Aerial Systems and its Application to Bioinspired Autonomous Vehicles

Room: **AMBRA**

Chair: Bala BALACHANDRAN, USA

15.00 *H-7:IL09* **Aerodynamics of Flying Fish**
HAECHEON CHOI, HYUNGMIN PARK, DUHO JE, School of Mechanical and Aerospace Engineering, Seoul National University, Seoul, Korea

15.30 *H-7:IL10* **Dynamics and Control of Biomorphic Swimming via Localized Vortex Shedding**
S.D. KELLY, Department of Mechanical Engineering and Engineering Science, University of North Carolina at Charlotte, NC, USA

16.00 *H-7:IL11* **Robotics for Human Swimming Movement**
M. NAKASHIMA, Tokyo Institute of Technology, Tokyo, Japan

16.30 *Break*

Chair: Haecheon CHOI, Korea

17.00 *H-7:L12* **Biomimetic Wings**
D. PIETROGIACOMI, **G.P. ROMANO,** Dept. Mechanical and Aerospace Engineering, University "La Sapienza", Roma, Italy

17.20 *H-7:IL14* **Dynamics of Swimming in Larval Fish**
J.L. VAN LEEUWEN[1], U.K. MÜLLER[2], G. LI[3], H. LIU[3], [1]Experimental Zoology Group, Wageningen University, The Netherlands; [2]Department of Biology, California State University Fresno, USA; [3]Graduate School of Engineering, Chiba University, Japan

17.50 *H-7:L16* **Bioinspired Parylene-coated Stress-driven Artificial Hair Cell for Flow Sensing in Air and Water**
F. RIZZI, A. QUALTIERI, M. DE VITTORIO, Center for Biomolecular Nanotechnologies @UNILE, Istituto Italiano di Tecnologia, Arnesano (LE), Italy; E. PRIMICERI, G. EPIFANI, G. MARUCCIO, NNL, Istituto Nanoscienze-CNR, Lecce (LE), Italy

Room: **TURCHESE**

Session I-3 - Wearable and Implantable Sensor Integration

Chair: Wilfried MOKWA, Germany

15.00 *I-3:KL* **CMOS Integration of Nano-Bio-Sensors**
S. CARRARA, EPFL - École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

15.40 *I-3:IL01* **Nanosensors, e-bra, Printable Electronics and Smart Devices for Point-of-Healthcare**
V.K. VARADAN, College of Medicine, University of Arkansas, Fayetteville, AR, USA & Pennsylvania State University, Hershey Medical Center, Hershey, PA, USA

16.10 *I-3:IL02* **A Smart Biological Signal-responsive Focal Drug Delivery System for Treatment of Refractory Epilepsy**
M.T. SALAM[1], A.H. HAMIE[1], D.K. NGUYEN[2], **M. SAWAN**[1], [1]Polystim Neurotechnologies Laboratory, École Polytechnique de Montréal, Québec, Canada; [2]Neurology Service, Department of Medicine, Notre-Dame Hospital, Centre Hospitalier de l'Université de Montréal (CHUM), Québec, Canada

16.40 *Break*

Chair: Sandro CARRARA, Switzerland

17.10 *I-3:IL03* **Implantable Wireless System for Stimulation of the Retina**
W. MOKWA, Institute of Materials in Electrical Engineering I, RWTH Aachen University, Aachen, Germany

17.40 *I-3:IL04* **Use of Machine Learning Algorithms for Interpreting Wearable Physical Activity Monitor Data**
P. FREEDSON, University of Massachusetts, Amherst, Department of Kinesiology, Amherst, MA, USA

Room: **SMERALDO 3**

Session J-3 - Medical Diagnostics and Imaging

Chair: Lev T. PERELMAN, USA

15.00 *J-3:IL01* **Single Molecule Tracking in Live Cells**
B. LOUNIS, Laboratoire Photonique Numérique et Nanosciences, Université de Bordeaux, Institut d'Optique & CNRS, Talence, France

15.30 *J-3:IL02* **MRI Tracking of Transplanted Stem Cells**
T. YAMAOKA, National Cerebral and Cardiovascular Center Research Institute, Suita, Japan

16.00 *J-3:IL03* **Immuno-pillar Chip: New Platform as a Diagnostic Tool for Diseases**
M. TOKESHI, Department of Applied Chemistry & FIRST Research Center for Innovative Nanodevices, Nagoya University, Nagoya, Japan

16.30 *J-3:IL04* **In Situ Orthopaedic Sensors**
S. SIRIVISOOT, Wake Forest Institute for Regenerative Medicine, Wake Forest University Health Sciences, Winston-Salem, NC, USA

17.00 *Break*

Session J-2 - Enabling Tools

Chair: Benjamin THIERRY, Australia

17.30 *J-2:L06* **Investigation of Cell-nanostructure Interactions with Force Microscopy**
L. KADEM[1], M. LÓPEZ-GARCÍA[2], H. KESSLER[2], J. P. SPATZ[3], **C. SELHUBER-UNKEL**[1], [1]University of Kiel, Institute for Materials Science, Dept. Biocompatible Nanomaterials, Kiel, Germany; [2]Institute for Advanced Study and Center of Integrated Protein Science Munich, Technical University of Munich, Dept. of Chemistry, Garching, Germany; [3]Max-Planck-Institute for Intelligent Systems, Dept. of New Materials and Biosystems, Stuttgart, Germany

17.50 *J-2:L07* **Self-folding Polymers Enable Microfluidics with a Twist**
M. JAMAL, Y.V. KALININ, A.M. ZARAFSHAR, D.H. GRACIAS, Department of Chemical & Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, USA

Room: **VENERE**

Session A-4 - Electrorheological and Magnetorheological Fluids

Chair: Vicenç TORRA, Spain

9.30 *A-4:IL02* **Novel Adaptive Damping Systems Based on Magnetorheological Fluids**
H. BÖSE, Fraunhofer-Institut für Silicatforschung ISC, Würzburg, Germany

10.00 *A-4:L06* **A Model Reference Adaptive Control of a Magnetorheological Fluid Brake**
R. RUSSO, **M. TERZO**, Department of Mechanics and Energetics, University of Naples "Federico II", Italy

10.20 *A-4:L07* **Modeling and Analysis of the Electrorheological Fluids (Suspension Flow) with Aligned-Structure Reformation**
YOUNGWOOK SEO[1], HYOUNG JIN CHOI[2], **YONGSOK SEO**[1], [1]School of Materials Science & Eng., College of Engineering, Seoul National University, Seoul, Korea; [2]Inha University, Incheon, Korea

10.40 *Break*

Session A-1.1 - Electroceramics

Chair: Catherine ELISSALDE, France

11.10 *A-1.1:IL16* **Modeling of 3D Magnetostrictive Systems with Application to Galfenol and Terfenol-D Actuators**
M. DAPINO, The Ohio State University, Department of Mechanical and Aerospace Engineering, Columbus, OH, USA; S. CHAKRABARTI, Cummins Inc., Columbus, IN, USA

11.40 *A-1.1:IL17* **Magnetic and Dielectric Properties of EuTiO3 Thin Film under Strain**
K. TANAKA, Department of Material Chemistry, Graduate School of Engineering, Kyoto University, Kyoto, Japan

12.10 *A-1.1:IL18* **First-principles Study of New Multiferroic Perovskite Oxides**
O. DIEGUEZ, J. INIGUEZ, ICMAB-CSIC Campus de la UAB, Bellaterra, Spain

Room: **AUDITORIUM**

Session A-6.1 - Multifunctional Materials, Hybrids and Nanocomposites

Chair: Franz FAUPEL, Germany

9.00 *A-6.1:IL19* **Chemically Grown Nanoparticles, Nanowires and Nanocomposites: Processing, Applications and Devices**
S. MATHUR, Inorganic and Materials Chemistry, University of Cologne, Cologne, Germany

9.30 *A-6.1:L21* **Functionalization of Carbon Nanotubes for Use of Active Nanostructured Substrates in Integrated Devices**
E. CAVALCANTI RODRIGUES VAZ, R. SCHNEIDER, J.V. DOS ANJOS, M. NAVARRO, P. SANTA-CRUZ, Federal University of Pernambuco - UFPE, DQF, Recife-PE, Brazil

9.50 *A-6.1:L22* **Interconnects Fundamental Properties and Magnetically Stimulated Nanoprocesses on Fe-Pt Substrates**
S. BELLUCCI[1], YU.F. ZHUKOVSKII[2], V.I. GOPEJENKO[3], N. BURLUTSKAYA[3], YU.N. SHUNIN[2, 3], [1]INFN-Laboratori Nazionali di Frascati, Frascati (Rome), Italy; [2]Institute of Solid State Physics, University of Latvia, Riga, Latvia; [3]Information Systems Management Institute, Riga, Latvia

10.10 *Break*

Session A-2 - Stimuli Responsive Polymers and Gels

Chair: Kazutoshi HARAGUCHI, Japan

10.40 *A-2:IL01* **Biologically Stimuli-responsive Hydrogels that Recognize Target Biomolecules**
T. MIYATA, Department of Chemistry and Materials Engineering, Kansai University, Suita, Osaka, Japan

11.10 *A-2:IL02* **Toward Autonomic Response: Self-oscillating Gels**
O. KUKSENOK, Chemical Engineering Department, University of Pittsburgh, Pittsburgh, PA, USA

11.40 *A-2:L03* **Monitoring the Swelling/Deswelling of Stimuli-responsive Hydrogels with Magneto-resistive Methods**
K.-F. ARNDT, Physical Chemistry of Polymers, TU Dresden, Dresden, Germany; I. MOENCH, IFW Dresden, Dresden, Germany

12.00 *A-2:L04* **Non-homogeneous and Anisotropic Swelling of Polymer Gels**
P. NARDINOCCHI, A. LUCANTONIO, University of Rome "La Sapienza", Italy; **L. TERESI**, University of Roma Tre, Italy

12.20 *A-2:L05* **Recent Progress in Flexible Screen-printed Ion-selective Sensors for Environmental and Wearable Applications**
G. MATZEU, C. ZULIANI, D. DIAMOND, CLARITY Centre for Sensor Web Technologies, NCSR, Dublin City University, Dublin, Ireland

Special Session A-10 - Emerging Non-volatile Memory Devices

Room: **PLUTONE**

Chair: Hongsik JEONG, Korea

9.00 *A-10:IL11* **Inorganic Nanoparticles for either Charge Storage or Memristance Modulation**
D. TSOUKALAS[1, 2], E. VERRELLI[1], [1]National Technical University of Athens, Zographou, Greece, [2]Institute of Microelectronics, NCSR Demokritos, Agia Paraskevi, Greece

9.30 *A-10:L12* **Memristive Memory: a Fundamental Shift**
J. NICKEL, J. JOSHUA YANG, M. PICKETT, M. ZHANG, J.P. STRACHAN, G. RIBEIRO, R.S. WILLIAMS, HP Laboratories, Palo Alto, CA, USA

9.50 *A-10:IL13* **Phase Change Memory Technology**
R. BEZ, Micron, Agrate Brianza (MB), Italy

10.20 *Break*

Chair: Dimitris TSOUKALAS, Greece

10.50 *A-10:IL15* **Recent Progress and Applications of PRAM**
HONGSIK JEONG, Memory Division of Samsung Elctronics, Yongin-city, Korea

11.20 *A-10:IL16* **Phase Transformations in PCMs**
F. HIPPERT, LMGP (CNRS, Grenoble-INP), Minatec, Grenoble, France; G. GHEZZI, S. MAITREJEAN, CEA LETI, Minatec campus, Grenoble, France; **J.Y. RATY**, Physics Department, University of Liege, Sart-Tilman, Belgium

Session A-11.1 - Theory, Modeling, Processing

Room: **ZENITH**

Chair: Gopalan SRINIVASAN, USA *(Programme Chair)*

8.55 *Welcome by Programme Chair*

9.00 *A-11.1:IL01* **Electronic Ferroelectricity: Modeling and Understanding**
S. PICOZZI, CNR, Istituto CNR-SPIN L'Aquila, Italy

9.30 *A-11.1:IL03* **From Magneto-Elasto-Electric Device to Ultra-low Noise Magnetic Sensor**
CH. DOLABDJIAN[1], X. ZHUANG[1], S. SAEZ[1], M. LAM CHOK SING[1], C. CORDIER[1], C. DOLABDJIAN[1], J.F. LI[2], D. VIEHLAND[2], [1]Groupe de Recherche en Informatique, Image, Automatique et Instrumentation de Caen (GREYC), CNRS UMR 6072-ENSICAEN and the University of Caen, Caen Cedex, France; [2]Department of Materials Science and Engineering, Virginia Tech, Blacksburg, VA, USA

10.00 *A-11.1:IL04* **First-principles Design of Multiferroics with Novel Functional Properties**
J. INIGUEZ, ICMAB-CSIC, Bellaterra, Barcelona, Spain

10.30 *Break*

Chair: Jorge INIGUEZ, Spain

11.00 *A-11.1:IL07* **Textured Ferroelectrics and Magnetoelectrics**
S. PRIYA, YONGKE YAN, Center for Energy Harvesting Materials and Systems (CEHMS), Virginia Tech, Blacksburg, VA, USA

11.30 *A-11.1:IL08* **Manipulating Charge and Spin Interactions Across multiferroic BiFeO3 and Ferromagnetic La0.7Sr0.3MnO3 Interfaces**
PU YU, RIKEN-Advanced Science Institute, Saitama, Japan

12.00 *A-11.1:L09* **Ex-situ Solid-phase Epitaxy of MOCVD-deposited LuFe2O4 Thin Films**
A. PLOKHIKH, A. AKBASHEV, A. KAUL, MSU, Moscow, Russian Federation

Room: **ORSA MAGGIORE**

Session A-12.3 - Nonlinear, Tunable & Active Metamaterials

Chair: Filiberto BILOTTI, Italy

9.00 *A-12.3:IL01* **Shaping of Light in Metamaterials and Plasmonic Structures**
Y.S. KIVSHAR, Nonlinear Physics Center, Australian National University, Canberra, Australia

9.30 *A-12.3:IL03* **Making Stable Plasmon Solitons**
D. SKRYABIN, A. MARINI, A. GORBACH, C. MILIAN, University of Bath, Bath, UK; B. MALOMED, University of Tel-Aviv, Israel

10.00 *A-12.3:IL04* **Magnetically Controllable Metamaterials**
SHIYANG LIU, Institute of Information Optics, Zhejiang Normal University, Jinhua, Zhejiang, China; ZHIFANG LIN, Surface Physics Laboratory and Department of Physics, Fudan Univeristy, Shanghai, China; S.T. CHUI, Bartol Research Institute, University of Delaware, Newark, Delaware, USA

10.30 *Break*

10.50 *A-12.3:IL05* **Nonlinear Optical Properties of Plasmonics Materials**
M. KAURANEN, G. GENTY, R. CZAPLICKI, H. PIETARINEN, H. HUSU, M. ZDANOWICZ, K.O. KOSKINEN, R. SIIKANEN, Department of Physics, Tampere University of Technology, Tampere, Finland; J. LEHTOLAHTI, J. LAUKKANEN, M. KUITTINEN, University of Eastern Finland, Department of Physics and Mathematics, Joensuu, Finland

11.20 *A-12.3:L06* **Nonlinear Backward-wave Photonic Metamaterials**
A.K. POPOV[1], M.I. SHALAEV[2]; S.A. MYSLIVETS[3]; V.V. SLABKO[2], I.S. NEFEDOV[4], [1]University of Wisconsin-Stevens Point, Stevens Point, WI, USA; [2]Siberian Federal University, Krasnoyarsk, Russian Federation; [3]Institute of Physics of Russian Academy of Sciences, Krasnoyarsk, Russian Federation; [4]Aalto University, Aalto, Finland

11.40 *Break*

Session A-12.1 - Microwave & THz Metamaterials

Chair: Francisco MEDINA, Spain

12.00 *A-12.1:L10* **Reflectionless Ultra-thin Wave-plate Based on Metamaterials**
WUJIONG SUN, **QIONG HE**, JIAMING HAO, LEI ZHOU, State Key Laboratory of Surface Physics and Key Laboratory of Micro and Nano Photonic Structures, Fudan University, Shanghai, China

12.20 *A-12.1:L11* **Tuning Extraordinary Transmission by Meander-lines in Hole Arrays**
V. TORRES, **P. RODRIGUEZ-ULIBARRI**, M. BERUETE, F. FALCONE, M. SOROLLA, Millimeter and Terahertz Waves Laboratory, Universidad Pública de Navarra, Pamplona, Spain; M. NAVARRO-CÍA, Experimental Solid State Group, Department of Physics, Imperial College London, London, UK

12.40 *A-12.1:L12* **Novel Pseudo-plasmonic Surfaces in the Microwave Regime**
H.J. RANCE, A.P. HIBBINS, J.R. SAMBLES, Electromagnetic Materials Group, University of Exeter, School of Physics, Exeter, Devon, UK

Room: **ORSA MINORE**

Session A-13.2 - Electronic and Optical Properties

Chair: Daniel NEUMAIER, Germany

9.30 *A-13.2:IL08* **Raman Spectroscopy of Pristine, Defected and Strained Graphene**
C. CASIRAGHI, School of Chemistry and Photon Science Institute, University of Manchester, UK, & Physics Department, Free University Berlin, Germany

10.00 *A-13.2:IL09* **Resonance Raman Scattering in Graphene**
M.A. PIMENTA, A. RIGHI, S.D. COSTA, D.L. MAFRA, A.O. COIMBRA, L.M. MALARD, C. FANTINI, L.G. MOURA, E.A. MOUJAES, H. CHACHAM, R.W. NUNES, Departamento de Fisica, Universidade Federal de Minas Gerais , Belo Horizonte, Brazil

10.30 *A-13.2:IL10* **Tailoring the Electronic Properties of Epitaxial Graphene on Metallic Substrates**
M. PAPAGNO, C. CARBONE, Istituto di Struttura della Materia, Consiglio Nazionale delle Ricerche, Trieste, Italy

11.00 *Break*

Session A-13.3 - Electronic, Spintronic, Optical and Sensing Applications

Chair: Ian KINLOCH, UK

11.30 *A-13.3:IL02* **Graphene-based Transistors with Tunable Band Gap**
D. NEUMAIER, AMO GmbH, Aachen, Germany

12.00 *A-13.3:IL03* **Graphene Field Effect Transistors for Bioelectronics**
J.A. GARRIDO, Walter Schottky Institut, Technische Universität München, Garching, Germany

12.30 *A-13.3:L04* **Two Dimensional Graphene/h-BCN Based Devices with Large Ion/Ioff Ratio for Digital Applications**
G. FIORI, S. BRUZZONE, G. IANNACCONE, Dipartimento Ingegneria dell'Informazione, University of Pisa, Pisa, Italy

Room: **URANO**

Session A-15.3 - Light-sensitive Polymers

Chair: Christopher BOWMAN, USA

8.30 *A-15.3:IL01* **Photomobile Polymer Materials**
T. IKEDA[1], T. UBE[1], M. YAMADA[2], M. KONDO[2], Y. NAKA[2], A. SHIMAMURA[2], J. MAMIYA[2], M. KINOSHITA[2], A. SHISHIDO[2], [1]Chuo University, Tokyo, Japan; [2]Tokyo Institute of Technology, Yokohama, Japan

9.00 *A-15.3:IL02* **Photoresponsive Liquid Crystal Polymer Networks: Glassy Adaptive Materials**
T.J. WHITE[1], KYUNG MIN LEE[2], D.H. WANG[3], LOON-SENG TAN[1], M.L. SMITH[4], H. KOERNER[2], R.A. VAIA[1], T.J. BUNNING[1], [1]AFRL/RX; [2]AFRL/RX, Azimuth Corp.; [3]AFRL/RX, UES; [4]AFRL/RX, NRC, USA

9.30 *A-15.3:L03* **Photo-responsive Polymeric Structures Based on Spiropyran**
L. FLOREA, D. DIAMOND, F. BENITO-LOPEZ, CLARITY: Centre for Sensor Web Technologies, National Centre for Sensor Research, School of Chemical Sciences, Dublin City University, Dublin, Ireland

9.50 *A-15.3:IL04* **Photoresponsive Liquid Crystalline Polymeric Materials**
D.J. BROER, Eindhoven University of Technology, Eindhoven, The Netherlands

10.20 *A-15.3:L05* **Azobenzene-containing, High Tg, Crosslinked & Linear Aromatic Polyimides: Photo-mechanically Bendable and Twistable Cantilevers**
LOON-SENG TAN, D.H. WANG[a], KYUNG MIN LEE[b], ZHENNING YU[c], H. KOERNER[a], R.A. VAIA, T.J. WHITE, Materials & Manufacturing Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, OH, USA; [a]UES, Inc. Dayton, OH, USA; [b]Azimuth Corp. Dayton, OH, USA; [c]Department of Chemistry, Wright State University, Dayton, OH, USA

10.40 *A-15.3:L06* **Light Responsive Polyolefins by Post-Reactor Modification**
F. CICOGNA, S. COIAI, S. MONTI, E. PASSAGLIA, Istituto di Chimica dei CompostiOrganometallici (ICCOM-CNR) UOS PISA, Pisa, Italy; G. PRAMPOLINI, V. BARONE, Scuola Normale Superiore, Pisa, Italy

11.00 *Break*

continued on next page

Session A-15.4 - Magneto-sensitive Materials

Chair: Filip DU PREZ, Belgium

11.20 *A-15.4:IL01* **Magnetic Heating of Polymer-SPION Hybrid Materials: From Fundamental Studies to Externally Triggered Drug Delivery**
R. HOOGENBOOM, Supramolecular Chemistry Group, Dept. of Organic Chemistry, Ghent University, Ghent, Belgium; S. ROVERS, J. KEURENTJES, Process Development Group, Dept. of Chemical Engineering and Chemistry, Eindhoven University of Technology, Eindhoven, The Netherlands

11.50 *A-15.4:IL02* **Electrically- and Magnetically Induced Motility of Polymer Gels and Smart Composites**
M. ZRINYI, Semmelweis University, Laboratory of Nanochemistry, Department of Biophysics and Radiation Biology, Budapest, Hungary

12.20 *A-15.4:L03* **Magnetic Ionogels for Fluid Handling in Microfluidic Devices**
B. ZIOLKOWSKI, K.J. FRASER, R. BYRNE, D. DIAMOND, CLARITY: The Centre for Sensor Web Technologies, National Centre for Sensor Research, Dublin City University, Dublin, Ireland

12.40 *A-15.4:L04* **Deformation Mechanisms in Iron-particle Magneto-rheological Elastomers: Experiments and Theory**
K. DANAS, N. TRIANTAFYLLIDIS, LMS, Ecole Polytechnique, Palaiseau, France; S.V. KANKANALA, BD Technologies, Salt Lake City, NC, USA

Room: **SMERALDO 1**

Session B-3 - Engineering

Chair: Manfred KOHL, Germany

8.30 *B-3:IL06* **Some Factors Affecting the Shape Recovery Characteristics of NiTi Alloys**
YONG LIU, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

9.00 *B-3:IL07* **Mechanical Behaviour of Architectured NiTi Materials in Complex Loading**
D. FAVIER, T. ALONSO, G. CHAGNON, V. DELOBELLE, University of Grenoble, France; H. LOUCHE, G. MACHADO, L.WALTZ, University of Montpellier, France; G. RIO, University of Bretagne Sud, France; Y. LIU University of Western Australia, Australia

9.30 *B-3:IL08* **Modelling of the Coupling Effect Between Phase Transformation and Plastic Gliding on the Thermomechanical Behavior of Iron Based SMA**
W. KHALI[1], C. BOUBY[1], A. MIKOLAJCZAK[2], **T. BEN ZINEB**[1], [1]LEMTA - Nancy University - CNRS, Nancy, France; [2]ESSTIN - Nancy University, Nancy, France

10.00 *B-3:IL09* **Nanostructured Ti-Ni SMA: Manufacturing, Microstructure, Static and Fatigue Functional Properties**
V. BRAILOVSKI, S. PROKOSHKIN, Department of Mechanical Engineering, Ecole de Technologie Superieure, Montreal, Canada; Dept. of Plastic Deformation of Special Alloys, National University of Science and Technology "MISIS", Moscow, Russian Federation

10.30 *Break*

Chair: Yoichi KISHI, Japan

Session B-4 - Composites

11.00 *B-4:IL01* **From Simple Nitinol Micro-wires Towards Complex Functional NiTi Textiles and Elastomer Composites**
L. HELLER, P. SITTNER, J. PILCH, D. VOKOUN, Institute of Physics ASCR, v.v.i., Czech Republic; K. JANOUCHOVA, M. VYSANSKA, K. JEZIK, M. SYROVATKOVA, Faculty of Textile Eng., Technical University of Liberec, Czech Republic; B. MARVALOVA, J. VLACH, Fac. of Mechanical Eng., Technical University of Liberec, Czech Republic

11.30 *B-4:IL02* **Recent Achievements of NiMnGa/Polymer Smart Composites**
H. HOSODA, T. INAMURA, Precision and Intelligence Laboratory, Tokyo Institute of Technology, Yokohama, Japan

Session B-5 - Low Dimensionality

12.00 *B-5:IL01* **FSMA Thin Films: Recent Developments**
V.A. CHERNENKO, Universidad del País Vasco, Dpto. Electricidad y Electronica, Bilbao, Spain and Ikerbasque, Basque Foundation for Science, Bilbao, Spain

12.30 *B-5:IL02* **Shape Memory and Superelastic cycling at Nano-scale**
J. SAN JUAN[1], M.L. NÓ[2], [1]Dpt. Física Materia Condensada, Facultad de Ciencia y Tecnología, Universidad del Pais Vasco, Bilbao, Spain; [2]Dpt. Física Aplicada II, Facultad de Ciencia y Tecnología, Universidad del Pais Vasco, Bilbao, Spain

Session D-3 - Functionality, Manufacturing, Application

Room: **ALBA 2**

Chair: Seong Hun KIM, Korea

8.30 *D-3:IL01* **Adaptive Textiles for the Home**
A. MOSSE', Centre for IT & Architecture, Royal Danish Academy of Fine Arts, School of Architecture, Design and Conservation, Copenhagen, Denmark

9.00 *D-3:IL02* **Continuous Multifunctional Carbon Nanotube Yarns**
YA-LI LI, Key Lab of Advanced Ceramics and Machining Technology Ministry of Education, School of Materials Science and Engineering, Tianjin University, Tianjin, China

9.30 *D-3:L03* **Design and Optimization of an Injection-moldable Force-fit Interconnection Module for Smart Textile Applications**
E.P. SIMON, M. FRÖHLICH, K.-D. LANG, Technische Universität Berlin, Berlin, Germany

9.50 *D-3:L04* **Challenges for Combining Semiconductor (Thin Film) Technology with Textile Substrates towards Textiles for Energy Production**
K. EUFINGER, F. GOVAERT, M. VANNESTE, Centexbel Gent, Zwijnaarde, Belgium; B. PAQUET, C. REVERCEZ, Centexbel Verviers, Herve (Chaineux), Belgium

10.10 *D-3:L05* **Nanoscience goes Pret-a-Porter: Novel Nanogold-Wool-Composite Fibres**
A. KOLB, School of Chemical and Physical Sciences and MacDiarmid Institute for Advanced Materials and Nanotechnology, Victoria University of Wellington, Wellington, New Zealand

10.30 *Break*

Chair: Rita PARADISO, Italy

11.00 *D-3:IL06* **Prosys-Laser: Smart Laser Protective Textile Systems**
G. DAMMACCO, Grado Zero Espace srl, Italy; M. HUSTEDT, C. HENNIGS, Laser Zentrum Hannover e.V., Germany; M. PACELLI, Smartex srl, Italy; C. KAESER, Centre Suisse d'Electronique et de Microtechnique SA, Switzerland; D. WENZEL, Sächsisches Textilforschungsinstitut e. V., Germany

11.30 *D-3:IL07* **The PASTA project: "Integrating Platform for Advanced Smart Textile Applications"**
J. DE BAETS, imec-CMST, Gent, Belgium

12.00 *D-3:L08* **Application of Flexible Polymer Dlectrode to Smart Textiles**
SEONG HUN KIM, TAE HWAN LIM, Department of Organic and Nano Engineering, Hanyang University, Seoul, Korea; KYUNG WHA OH, Department of Home Economics Education, Chung-Ang University, Seoul, Korea

12.20 *D-3:L09* **Two Novel Techniques of Fabric Sensing using Carbon Nanofibres**
A. SANTOS, P. ARQUER, B. RUIZ, ITMA Materials Technology, Aviles, Spain

12.40 *D-3:L10* **Improvements of Electronic Contact System in a Smart Garment**
I. PARKOVA, A. VALIŠEVSKIS, A. VILUMSONE, Riga Technical University, Institute of Textile Materials Technology and Design, Riga, Latvia

Room: **SIRIO**

Chair: Albert ROMANO-RODRIGUEZ, Spain

Session E-6 - Energy Harvesting and Power Supply MEMS

8.30 *E-6:IL05* **Novel Energy Harvesting Systems with Dual Micro-nano Strctures**
HAIXIA ZHANG, Institute of Microelectronics, Peking University, Beijing, China

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

9.00 *E-2:IL01* **Gas Sensors: Status and Future Trends**
M. FLEISCHER, Siemens AG - Corporate Research & Technology, München, Germany

9.30 *E-2:IL02* **Semiconductor Nanowire Battery-less Chemical Sensors**
Y.(M.) WANG, Physical and Life Sciences Directorate, Lawrence Livermore National Laboratory, Livermore, CA, USA

10.00 *E-2:IL03* **Smart Electrochemical Microdevices**
H. SUZUKI, University of Tsukuba, Tsukuba, Japan

10.30 *Break*

Session E-4 - Smart Micro-nano Systems and Components Integration

Chair: Ulrich SCHMID, Austria

11.00 *E-4:IL01* **Integration of Carbon Nanotubes into MEMS for Ultra-low Power Sensors**
C. HIEROLD, C. ROMAN, M. MUOTH, K. CHIKKADI, S.-W. LEE, E. CAGIN, M. HALUSKA, ETH Zurich, Department of Mechanical and Process Engineering, Micro and Nanosystems, Zurich, Switzerland

11.30 *E-4:IL02* **Combined Top-down and Bottom-up Approach for Next-generation 3D MEMS**
M. SUGIYAMA, School of Engineering, The University of Tokyo 3D BEANS Center, BEANS Project, Japan

12.00 *E-4:L05* **Modeling of Piezo-actuated Stick-slip Micro-drives: An Overview**
H.X. NGUYEN, C. EDELER, S. FATIKOW, Division of Microrobotics and Control Engineering, University of Oldenburg, Oldenburg, Germany

12.20 *E-4:L06* **Controlled Connectivity in Random Nanowire Networks**
P.N. NIRMALRAJ[1, 3], A.P. BELL[1, 3], A.T. BELLEW[1, 3], E.K. MCCARTHY[1, 3], L.F.C. PEREIRA[2, 3], S. SOREL[2, 3], J.N. COLEMAN[2, 3], M.S. FERREIRA[2, 3], **J.J. BOLAND**[1, 3], [1]School of Chemistry, Trinity College Dublin 2, Ireland; [2]School of Physics, Trinity College Dublin 2, Ireland; [3]Center for Research on Adaptive Nanostructures and Nanodevices, Trinity College Dublin, Dublin 2, Ireland

Room: **GIOVE**

Chair: Fedor STARIKOV, Russia

Session F-7-Adaptive Optics for Biological Applications

8.30 *F-7:IL03* **Adaptive Optics for High Resolution Scanning Optical Microscopy**
M.J. BOOTH, Department of Engineering Science, University of Oxford, Oxford, UK

Session F-4 - Adaptive Optics

9.00 *F-4:IL01* **Intelligent Optical Systems using Adaptive Optics**
N. CLARK, NASA Langley Research Center, Hampton, VA, USA

9.30 *F-4:IL02* **Adaptive Optics for Extremely High Power Lasers**
A. KUDRYASHOV, Moscow State Open University and Active Optics NightN (Ltd), Russia

10.00 *F-4:IL03* **Testbed for Adaptive Optics Testing**
S.R. RESTAINO, C.C. WILCOX, J.R. ANDREWS, F. SANTIAGO, T. MARTINEZ, Wavefront Sensing and Control Section Code 7216, Remote Sensing Div., Naval Research Laboratory, Albuquerque, NM, USA

10.30 *F-4:IL04* **Adaptive Optics at the Large Binocular Telescope**
S. ESPOSITO, Osservatorio di Arcetri, Firenze, Italy

11.00 *Break*

Chair: Sergio RESTAINO, USA

11.30 *F-4:IL05* **Adaptive Optical Systems in Russian Federal Nuclear Center - VNIIEF with Different Control Principles**
S.G. GARANIN, S.V. KHOKHLOV, A.N. MANACHINSKY, **F.A. STARIKOV**, Russian Federal Nuclear Center - VNIIEF,Institute of Laser Physics Research, Sarov, Russia

12.00 *F-4:IL06* **An Optical Vortex Coronagraph for the 3.5 m Galileo National Telescope (TNG)**
T. OCCHIPINTI, Adaptica Srl, Italy; C. BARBIERI, E. MARI, G. NALETTO, F. ROMANATO, A. SPONSELLI, F. TAMBURINI, University of Padova, Italy; E. DIOLAITI, INAF Astronomical Observatory Bologna, Italy; A. GHEDINA, INAF Telescopio Nazionale Galileo, Spain; G. SWARTZLANDER, Rochester Institute of Technology, USA; B. THIDÉ, Swedish Institute of Space Physics, Sweden

12.30 *F-4:L07* **High Resolution Wavefront Control Using a Photo-controlled Deformable Mirror in Closed Loop**
S. BONORA, CNR-IFN, Laboratory for Ultraviolet and X-ray Optical Research, LUXOR, Padova, Italy; **U. BORTOLOZZO**, S. RESIDORI, INLN, Université de Nice-Sophia Antipolis, CNRS,Valbonne, France; D. COBURN, C. DAINTY, National University of Ireland, Applied Optics Group, Galway, Ireland

WEDNESDAY JUNE 13 MORNING

Room: **LE PLEIADI**

Chair: Sara CASCIATI, Italy / Hans IRSCHIK, Austria

Session G-3 - Smart Structures and Integrated Systems

8.30 *G-3:IL01* **Seismic Protection of Structures with Resettable Tuned Mass Dampers**
C.C. LIN, National Chung Hsing University, Taichung, Taiwan; **T.T. SOONG**, State University of New York at Buffalo, Buffalo, NY, USA

9.00 *G-3:IL04* **Mechanics and Model-based Control of Structures**
H. IRSCHIK, M. KROMMER, K. SCHLACHER, Johannes Kepler University of Linz, Linz, Austria

9.30 *G-3:L21* **A Coupled Electro-mechanical System for Damage Detection and Energy Harvesting**
J. CIAMBELLA, **F. VESTRONI**, Dipartimento di Ingegneria Strutturale e Geotecnica, SAPIENZA Università di Roma, Roma, Italy

Session G-4 - Bio-inspired Materials and Structures

9.50 *G-4:IL01* **What We Can Learn from Nature's Flyers for Better Flapping Air Vehicle?**
JAE-HUNG HAN, Dept. of Aerospace Eng., KAIST, Daejeon, South Korea

10.20 *Break*

Session G-3 - Smart Structures and Integrated Systems

10.50 *G-3:IL05* **Structural Damage Identification by Finite Element Model Updating**
G. DE ROECK, Department Civil Engineering, K.U. Leuven, Leuven, Belgium

11.20 *G-3:IL06* **Vibration-based Damage Detection under Changing Environmental and Operational Conditions**
C.-P. FRITZEN, P. KRAEMER, I. BUETHE, University of Siegen, Siegen, Germany

11.50 *G-3:IL07* **Monitoring, Evaluation and Control for Life-cycle Performance of Intelligent Civil Structures**
HUI LI[1], J.P. OU[1, 2], [1]Research Center of Structural Monitoring and Control, Harbin Institute of Technology, Harbin, China; [2]Faculty of Infrastructure Engineering, Dalian University of Technology, Dalian, China

Room: **SMERALDO 2**

Session H-3 - Bio-inspired Sensors and Actuators

Chair: Jacques DESBRIERES, France

9.00 *H-3:IL02* **Development of an Odorant Sensor Using Living Cells Expressing Insect Odorant Receptors**
H. MITSUNO, T. SAKURAI, H. MITSUHASHI, R. KANZAKI, Research Center for Advanced Science and Technology, The University of Tokyo, Meguro-ku, Tokyo, Japan; Graduate School of Information Science and Technology, The University of Tokyo, Bunkyo-ku, Tokyo, Japan

9.30 *H-3:IL03* **Imitating the Cricket Cercal System: the Beauty of the Beast with a Twist of the Engineer**
G. KRIJNEN, MESA + Research Institute, University of Twente, Enschede, The Netherlands

10.00 *H-3:IL04* **Mimicking Insect Ultrastructures for Vision**
KI-HUN JEONG, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

10.30 *Break*

Session H-4 - Biologically Inspired Systems and Robotics

Chair: Hao LIU, Japan

11.00 *H-4:IL01* **Biomolecular Motor-powered Devices**
H. HESS, Department of Biomedical Engineering, Columbia University, New York, USA

11.30 *H-4:IL02* **Photon-fuelled DNA Nanomachine Carrying Azobenzene as Molecular Engine**
H. ASANUMA, H. NISHIOKA, X. LIANG, Department of Molecular Design and Engineering, Nagoya University, Nagoya, Japan

12.00 *H-4:IL03* **Smart Materials and Systems in BioRobotics**
P. DARIO, C. LASCHI, **C. STEFANINI**, A. MENCIASSI, The BioRobotics Institute, Scuola Superiore Sant'Anna, Pisa, Italy; B. MAZZOLAI, Center for Micro-BioRobotics of IIT@SSSA, Pontedera (Pisa), Italy

12.30 *H-4:L04* **A Low-temperature Approach to Spiking Neural Circuits**
E.M. VOGEL, School of Materials Science & Engineering, Georgia Institute of Technology, Atlanta, GA, USA; A. SUBRAMANIAM, K.D. CANTLEY, Department of Electrical Engineering, The University of Texas at Dallas, Richardson, TX, USA

Special Session H-7 - Biomimetic Flow Control in Aquatic and Aerial Systems and its Application to Bioinspired Autonomous Vehicles

Room: **AMBRA**

Chair: Luca SCHENATO, Italy

9.30 *H-7:IL05* **Reversed Flapping Flight and Inverted Hydrodynamical Drafting**
JUN ZHANG, L. MORET, L. RISTROP, T. SCHNIPPER, Applied Mathematics Laboratory, Courant Institute, New York University, New York, USA

10.00 *H-7:IL06* **Advantages of an Ornithopter against an Airplane with a Propeller**
S. SUNADA, Osaka Prefecture University, Sakai, Osaka, Japan

10.30 *H-7:L08* **Fabrication Methods for Artificial Butterfly Scales and Shark Ribs for Micro Aerial Vehicles**
M. KOVAC, G. ROULET, M. SMITH, R. WOOD, Harvard Microrobotics Laboratory, Harvard University, Cambridge, MA, USA

Session I-4 - Energy Harvesting, Sensor Networks, Signal Processing, Data Transmission

Room: **TURCHESE**

Chair: Anna M. BIANCHI, Italy

9.00 *I-4:IL01* **Energy Harvesting from Motion for Body Sensor Networks**
E.M. YEATMAN, **P. MITCHESON**, Department of Electrical & Electronic Engineering, Imperial College London, London, UK

9.30 *I-4:IL02* **Signal Processing for Capsule Endoscope Video**
T.A. RAMSTAD, Dept. of Electronics and Telecommunications, The Norwegian University of Science and Technology (NTNU), Trondheim, Norway

10.00 *I-4:IL03* **Algorithms for Strongly Increased Robustness and Reliability of Wearable Sensor Nodes**
J. PENDERS, I. ROMERO, T. BERSET, C. VAN HOOF, imec / Holst Centre, Eindhoven, The Netherlands

10.30 *Break*

Chair: Maria Teresa ARREDONDO, Spain

11.00 *I-4:IL04* **Analysis and Biomedical Signal Processing in Wearable Devices for Cardiovascular Diseases Prevention**
A.M. BIANCHI, Dipartimento di Bioingegneria, Politecnico di Milano, Milano, Italy

11.30 *I-4:L06* **Wearable Hybrid Sensor Array for Motor Cortex Monitoring**
R.A. SHOURESHI, New York Institute of Technology, New York City, NY, USA; C.M. AASTED, University of Denver, Denver, CO, USA

11.50 *I-4:L07* **BSN-based Activity Classification: A Low Complexity Windowing-&-Classification Approach**
M. GIUBERTI, G. FERRARI, University of Parma, Parma, Italy

Room: **SMERALDO 3**

Session J-3 - Medical Diagnostics and Imaging

Chair: Tetsuji YAMAOKA, Japan

8.30 *J-3:IL07* **DNA-functionalized Nanoparticles for Biosensing**
M. MAEDA, Bioengineering Laboratory, RIKEN, Wako-shi, Saitama, Japan

9.00 *J-3:IL08* **Single Gold Nanorod Detection Using Confocal Light Absorption and Scattering Spectroscopy**
L.T. PERELMAN, Harvard University, Boston, MA, USA

9.30 *J-3:L09* **Nanoparticles for Detection of a Deadly Virus Using a Co-localization Strategy**
F. LISI, P. FALCARO, D. BUSO, A.J. HILL, CSIRO, Division of Materials Science and Engineering, Clayton South MDC, Victoria, Australia); J. BARR, G. CRAMERI, L. WANG, CSIRO, Division of Animal Health, Geelong, Victoria, Australia; T.L. NGUYEN, P. MULVANEY, Melbourne University, Parkville, Victoria, Australia

9.50 *J-3:L11* **Random, Aligned and Patterned Coaxially Electrospun Fibres as Biomimetic Materials in Medical Imaging**
FENG-LEI ZHOU, **P. HUBBARD**, G. PARKER, Imaging Sciences, School of Cancer and Enabling Sciences, Manchester Academic Health Centre, The University of Manchester, UK; S. EICHHORN, Physics and Astronomy, University of Exeter, UK

10.10 *Break*

continued on next page

Session J-4 - Tissue Engineering and Regenerative Medicine

Chair: Motoichi KURISAWA, Singapore

10.40 *J-4:IL01* **From Bone to Cartilage to Cardiac Tissue: Nanotechnology-derived Supramolecular Nanotubes for Tissue Engineering Applications**
L. SUN[1], X. MENG[2], L. ZHANG[4] , H. FENNIRI[5], **T.J. WEBSTER**[1, 3], [1]School of Engineering, Brown University, Providence, RI, USA; [2]Dept. of Chemistry, Brown University, Providence, RI, USA; [3]Dept. of Orthopaedics, Brown University, Providence, RI, USA; [4]Dept. of Mechanical and Aerospace Engineering, George Washington University, Washington, DC, USA; [5]National Institute for Nanotechnology and Department of Chemistry, National Research Council and University of Alberta, Edmonton, Canada

11.10 *J-4:IL02* **Cellular Multilayers as an Engineered Tissue Model Fabricated by Layer-by-Layer Assembly of Cell and Proteins**
M. MATSUSAKI, M. AKASHI, Department of Applied Chemistry, Graduate School of Engineering, Osaka University, Suita, Osaka, Japan

11.40 *J-4:L03* **Biomimetic Apatite-based Biomaterials: on the Underestimated Impact of Synthesis and Post-synthesis Parameters**
N. VANDECANDELAERE, C. REY, C. DROUET, CIRIMAT Carnot Institute, University of Toulouse, UMR CNRS/INPT/UPS 5085, Toulouse cedex, France

12.00 *J-4:L04* **Surface Cell Growth Engineering Assisted by Novel Protein Nanomaterial and the Impact of Genetic Tailoring on their Properties**
I. RATERA, **W. TATKIEWICZ**, C. DÍEZ-GIL, J. VECIANA, Dept. of Molecular Nanoscience and Organic Materials, Institut de Ciencia de Materials de Barcelona (CSIC), Bellaterra, Spain and CIBER de Bioingeniería, Biomateriales y Nanomedicina (CIBER-BBN) Bellaterra, Spain; J. SERAS, E. GARCÍA-FRUITÓS, E. VÁZQUEZ, E. RODRÍGUEZ-CARMONA, R.M. FERRAZ, O. CANO, N. FERRER-MIRALLES, A. VILLAVERDE, CIBER de Bioingeniería, Biomateriales y Nanomedicina (CIBER-BBN) Bellaterra, Spain, Institut de Biotecnologia i de Biomedicina, Universitat Autonoma de Barcelona, Bellaterra, Spain, and Department of Genetics and Microbiology Universitat Autonoma de Barcelona, Bellaterra, Spain

12.20 *J-4:L05* **Engineered Nanostructured Coatings for Enhanced Biointegration of Orthopaedic Implants**
F. NAMAVAR[1], A. RUBINSTEIN[1], R.F. SABIRIANOV[2], G.M. THIELE[3], J.G. SHARP[4], K.L. GARVIN[1]; [1]Dept. of Orthopaedic Surgery and Rehabilitation, University of Nebraska Medical Center, Omaha, NE, USA; [2]Dept. of Physics, University of Nebraska, Omaha, NE, USA; [3]Dept. of Internal Medicine - Rheumatology, University of Nebraska Medical Center, Omaha, NE, USA; [4]Dept. of Genetics, Cell Biology and Anatomy, University of Nebraska Medical Center, Omaha, Nebraska, USA

Session A-1.2 - Biologically, Chemically and Environmentally Responsive Inorganic Materials

Room: **VENERE**

Chair: Joao ROCHA, Portugal

15.00 *A-1.2:IL02* **Light-switchable Nanoparticles**
R. KLAJN, S. DAS, Department of Organic Chemistry, Weizmann Institute of Science, Rehovot, Israel

15.30 *A-1.2:L03* **Towards Molecular Recognition by Smart Multifunctional Mesoporous Silica Microdot Arrays through the Combination of Ink-jet Printing, EISA and Click Chemistry**
O. DE LOS COBOS, M. LEJEUNE, F. ROSSIGNOL, SPCTS, Centre Européen de la Céramique, Limoges, France; C. CARRION, Plateforme Cytométrie-Imagerie-Mathématiques, Faculté de Médecine, Limoges Cedex, France; C. BOISSIERE, F. RIBOT, C. SANCHEZ, LCMCP, Universite Pierre et Marie Curie Paris VI, College de France, Paris Cedex, France; X. CATTOEN, M. WONG CHI MAN, J-O. DURAND, ICGM, Montpellier, France

15.50 *A-1.2:L04* **Metallic Electrolyte Composites in the Framework of the Brick-layer Model**
H. LUSTFELD, PGI-1 Forschungszentrum Juelich, Juelich, Germany; C. PITHAN, PGI-7 Forschungszentrum Juelich, Juelich, Germany; M. REISSEL, Fachhochschule Aachen, Abteilung Juelich, Juelich, Germany

16.10 *Break*

Chair: Rafal KLAJN, Israel

16.40 *A-1.2:IL05* **Smart Luminescent Microporous Materials**
J. ROCHA, University of Aveiro, CICECO, Department of Chemistry, Aveiro, Portugal

17.10 *A-1.2:IL06* **Nanostructured Vanadium Oxide Films Made by Liquid Phase Deposition: Morphology, Structure and Optical Property Control**
M. ES-SOUNI, R. MINCH, Institute of Materials & Surface Technology, University of Applied Sciences Kiel, Kiel, Germany

Session A-2 - Stimuli Responsive Polymers and Gels

Room: **AUDITORIUM**

Chair: Manfred STAMM, Germany

15.00 *A-2:IL06* **Nanocomposite Hydrogels (NC gels) with Excellent Optical, Mechanical and Stimuli-responsive Properties**
K. HARAGUCHI, Kawamura Institute of Chemical Research, Sakura, Chiba, Japan

15.30 *A-2:L08* **Hydrogel Sensors for Process Monitoring**
M. WINDISCH, Dresden University of Technology, Faculty of Electrical Engineering and Information Technology, Germany; T. JUNGHANS, Dresden University of Technology, Dept of Chemistry and Food Chemistry, Germany

15.50 *A-2:L09* **Multi-responsive Hydrogels for Sensing Applications from Thiolactone Functionalized Polymers**
S. REINICKE, P. ESPEEL, J. VANNEVEL, R. HOOGENBOOM, F. DU PREZ, University of Ghent, Ghent, Belgium

16.10 *A-2:L11* **Development of Ultra Sensitive Strain Sensors Based on All-organic Flexible Thin-films**
C. ROVIRA, E. LAUKHINA, R. PFATTNER, L. FERRERAS, M. MAS-TORRENT, V. LAUKHIN, J. VECIANA, Institut de Ciència de Materials de Barcelona (CSIC) and Networking Research Center on Bioengineering, Biomaterials and Nanomedicine, Bellaterra, Spain

16.30 *A-2:IL15* **Stimuli-responsive Polymer Brushes for Sensing Applications and Protein Adsorption**
M. STAMM, Leibniz-Institut für Polymerforschung Dresden, Germany

Room: **GIOVE**

Session A-5.1 - Luminescent Materials

Chair: Delia MILLIRON, USA

15.00 *A-5.1:IL01* **Plasmonically Controlled Lasing Oscillation with Metallic-dielectric Core-shell Nanoparticles**
K. FUJITA, Department of Material Chemistry, Graduate School of Engineering, Kyoto University, Kyoto, Japan

15.30 *A-5.1:IL02* **Luminescent Organic Nanofibers**
J. KJELSTRUP-HANSEN, L. TAVARES, P.B.W. JENSEN, H.-G. RUBAHN, NanoSYD, Mads Clausen Institute, University of Southern Denmark, Soenderborg, Denmark

16.00 *A-5.1:IL03* **Photoresponsive Inorganic Materials**
SHIN-ICHI OHKOSHI, Department of Chemistry, School of Science, The University of Tokyo, Tokyo, Japan; and JST, CREST, Tokyo, Japan

16.30 *A-5.1:L04* **Preparation of Optoelectronics Glass Using Mesoporous SiO2/PVA**
S. FUJINO, K. NAGANO, H. IKEDA, T. KAJIWARA, Kyushu University, Fukuoka, Japan

16.50 *Break*

Session A-5.2 - Chromogenic Material Systems

Chair: Koji FUJITA, Japan

17.20 *A-5.2:IL01* **Electrochromism of Nanocrystal-based Metal Oxide Films**
G. GARCIA, A. LLORDES, R. BUONSANTI, R.J. MENDELSBERG, E.L. RUNNERSTROM, **D.J. MILLIRON**, Lawrence Berkeley National Laboratory and University of California, Berkeley, CA, USA

17.50 *A-5.2:IL03* **Chromogenic Windows**
C.G. GRANQVIST, Department of Engineering Sciences, The Ångström Laboratory, Uppsala University, Uppsala, Sweden

Room: **ZENITH**

Session A-11.2 - Magnetoelectric Characterization

Chair: Shashank PRIYA, USA

15.00 *A-11.2:IL01* **New Multiferroic Manganite and Ferrite with Strong Magnetoelectric Coupling**
Y. TAGUCHI, H. SAKAI, D. OKUYAMA, D. HASHIZUME, Y. TOKURA, RIKEN, Wako, Japan; J. FUJIOKA, F. KAGAWA, Univ. of Tokyo, Tokyo, Japan; T. FUKUDA, JAEA/SPring-8, Hyogo, Japan; H. NAKAO, Y. MURAKAMI, CMRC-PF, IMSS, KEK, Tsukuba, Japan; T. ARIMA, Univ. of Tokyo, Kashiwa, Japan; A.Q.R. BARON, RIKEN SPring-8 Center, Hyogo, Japan

15.30 *A-11.2:IL02* **Magnetoelectric Coupling and Isostructural Phase Transitions in the Solid Solutions of the Multiferroic BiFeO3 with BaTiO3 and PbTiO3**
D. PANDEY, School of Materials Science and Technology, Institute of Technology, Banaras Hindu University, Varanasi, India

16.00 *A-11.2:IL03* **Isothermal Electric Control of Exchange Bias near Room Temperature**
C. BINEK[1], XI HE[1], YI WANG[1], N. WU[1], A. WYSOCKI[1], T. KOMESU[1], U. LANKE[2], A.N. CARUSO[3], E. VESCOVO[4], K.D. BELASHCHENKO[1], P.A. DOWBEN[1], [1]Department of Physics & Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, NE, USA; [2]Canadian Light Source Inc., University of Saskatchewan, Saskatoon, Saskatchewan, Canada; [3]Department of Physics, University of Missouri, Kansas City, KS, USA; [4]Brookhaven National Laboratory, National Synchrotron Light Source, Upton, NY, USA

16.30 *A-11.2:L04* **Exchange Biasing of Magnetoelectric Thin Film Composites**
E. LAGE, C. KIRCHHOF, D. MEYNERS, **E. QUANDT**, Christian Albrechts University Kiel, Kiel, Germany

16.50 *A-11.2:L05* **Magnetoelectric Properties of Layered Thin Film Composites**
HEE YOUNG LEE, Yeungnam University, Gyeongsan, Korea

Session A-12.4 - Cloaking, Transformation Optics, Antennas, Superlenses

Room: **ORSA MAGGIORE**

Chair: Huanyang CHEN, China

15.00 *A-12.4:IL05* **To Invisibility and Beyond**
U. LEONHARDT**,** University of St. Andrews, St. Andrews, UK; **YUNGUI MA**, Zhejang University, China

15.30 *A-12.4:IL06* **Dirac-cone Dispersion at k=0 and its Implications**
X.Q. HUANG, Y. LAI, Z.H. HANG, F.M. LIU, C.T. CHAN, Department of Physics, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

16.00 *A-12.4:IL08* **Superlensing with Arrays of Metallic Nanorods**
P. BELOV, Queen Mary University of London, UK & National Research University ITMO, St. Petersburg, Russia

16.30 *Break*

17.00 *A-12.4:IL09* **Near-field Mapping of (Slow) Light**
L.(K.) KUIPERS, FOM Institute for Atomic and Molecular Physics (AMOLF), Amsterdam, The Netherlands

17.30 *A-12.4:L10* **On Conformal Lenses**
HUANYANG CHEN, School of Physical Science and Technology, Soochow University, Suzhou, Jiangsu, China

Session A-13.3 - Electronic, Spintronic, Optical and Sensing Applications

Room: **ORSA MINORE**

Chair: Gianluca FIORI, Italy

15.30 *A-13.3:IL06* **Graphene Nanostructures for Building Blocks of Quantum-dot Based Nanodevices**
S. MORIYAMA, International Center for Materials Nanoarchitectonics, National Institute for Materials Science (NIMS), Tsukuba, Ibaraki, Japan; Y. MORITA, Faculty of Engineering, Gunma University, Kiryu, Gunma, Japan; K. ISHIBASHI, Advanced Device Laboratory, RIKEN, Saitama, Japan; E. WATANABE, D. TSUYA, Nanotechnology Innovation Center, NIMS, Tsukuba, Ibaraki, Japan

16.00 *A-13.3:IL07* **Graphene Quantum Systems**
S. DRÖSCHER, A. JACOBSEN, D. BISCHOF, T. IHN, **K. ENSSLIN**, ETH Zurich, Switzerland

16.30 *A-13.3:L09* **In-situ CCVD Grown Graphene Transistors with Ultra-high On/Off-Current Ratio in Silicon CMOS Compatible Processing**
P.J. WESSELY, F. WESSELY, E. BIRINCI, U. SCHWALKE, Technische Universität Darmstadt, Darmstadt, Germany; B. RIEDINGER, Fraunhofer-Institut für Werkstoffmechanik, Freiburg, Germany

Room: **SMERALDO 1**

Session B-5 - Low Dimensionality

Chair: Volodymyr CHERNENKO, Spain

15.00 *B-5:IL03* **Low Temperature Crystallization of Sputter-Deposited TiNi Films**
Y. KISHI[1], N. IKENAGA[2], N. SAKUDO[1], Z. YAJIMA[1], [1]Advanced Materials Science Research and Development Center, Kanazawa Institute of Technology, Ishikawa, Japan; [2]Research Laboratory for Integrated Technological Systems, Kanazawa Institute of Technology, Ishikawa, Japan

15.30 *B-5:IL05* **Magnetic Shape Memory Alloys Going Nano**
S. FÄHLER, IFW Dresden, Dresden, Germany

16.00 *B-5:L06* **Elastocaloric Properties of Sputtered NiTi Thin Films**
C. BECHTOLD, R. LIMA DE MIRANDA, M. WUTTIG, Department of Materials Science and Engineering, University of Maryland, College Park, MD, USA; E. QUANDT, Inorganic Functional Materials, Institute for Material Science, Christian Albrechts University Kiel, Kiel, Germany

16.20 *Break*

Session B-1 - Materials

Chair: Sebastian FÄHLER, Germany

16.40 *B-1:L09* **Making Smart Materials Smarter**
I. KHAN, Chief Technology Officer (CTO), Innovative Processing Technologies Toronto, Ontario, Canada; N. ZHOU, Canadian Research Chair, University of Waterloo, Waterloo, Ontario, Canada

17.00 *B-1:L11* **Implications of Twinning Kinetics on the Dynamic Magneto-mechanical Response in NiMnGa**
E. FARAN, D. SHILO, Faculty of Mechanical Engineering, Technion, Haifa, Israel

17.20 *B-1:L12* **From Dual-shape/Temperature Memory Effect to Triple-shape Memory Effect in NiTi Shape Memory Alloys**
W.M. HUANG, C. TANG, C.C. WANG, H. PURNAWALI, Nanyang Technological University, Singapore

17.40 *B-1:L13* **Alloy Design and Superelasticity in Fe-Mn-Al-Ni Alloy**
T. OMORI, K. ANDO, I. OHNUMA, K. ISHIDA, R. KAINUMA, Tohoku University, Sendai, Japan

18.00 *Break*

continued on next page

Session B-2 - Phase Transformation and Microstructure

Chair: Yasukazu MURAKAMI, Japan

18.10 *B-2:L13* **Superelastic Behavior in Single Crystals of Cu-Al-Mn Shape Memory Alloy**
S. KAWATA, T. OMORI, R. KAINUMA, Department of Materials Science, Graduate School of Engineering, Tohoku University, Sendai, Japan

18.30 *B-2:L15* **Martensitic Transformation and Shape Memory Effect in TiNi Alloy Subjected to Neutrons Irradiation**
S.P. BELYAEV[1,2], R.F. KONOPLEVA[1], A.V. NAKIN[1], V.A. CHEKANOV[1], [1]Peterburg Nuclear Physics Institute of Russian Academy of Science, Gatchina, Russia; [2]Saint-Petersburg State University, Saint-Petersburg, Russia

18.50 *B-2:L18* **Inverse Magnetocaloric Effect in Mn3GaC at the Thermally Hysteretic Magnetostructural Transition**
O. CAKIR, M. ACET, Physics Dept., Yildiz Technical University, Istanbul, Turkey; Experimental Physics, Duisburg-Essen University, Duisburg, Germany

Session C-3 - Device Development and Integration Technologies

Room: **URANO**

Chair: Hani NAGUIB, Canada

15.00 *C-3:IL01* **Lab-on-a-chip Applications of Dielectric Elastomer Actuators**
H.R. SHEA, Ecole Polytechnique Fédérale de Lausanne (EPFL), EPFL-LMTS, Neuchatel, Switzerland

15.30 *C-3:IL02* **Actuation of Model Phalanges by Ion Polymer Metal Compound**
T. IHARA, T. NAKAMURA, Suzuka University of Medical Science, Suzuka, Japan; K. ASAKA, National Institute of Advanced Industrial Science and Technology, Japan

16.00 *C-3:IL03* **Haptic Devices**
P. LOTZ, Continental Automotive GmbH, Babenhausen, Germany

16.30 *C-3:L04* **Dynamic Daylight Redirection for Smart Windows**
B.A. HELMS, G. MASSON, R. MENDELSBERG, S. CABRINI, D.J. MILLIRON, A. ANDERS, S. SELKOWITZ, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

16.50 *Break*

Chair: Herbert SHEA, Switzerland

17.20 *C-3:IL05* **New Dielectric Elastomer Actuators for Biomedical and Bioinspired Systems**
F. CARPI[1], G. FREDIANI[1], D. DE ROSSI[1, 2]; [1]University of Pisa, Interdepartmental Research Centre "E. Piaggio", Pisa, Italy; [2]Technology & Life Institute, Pisa, Italy

17.50 *C-3:IL06* **Integrating Soft Control into Soft Machines**
I.A. ANDERSON, B.M. O'BRIEN, T. CHUN HIN TSE, T.A. GISBY, Biomimetics Lab, Auckland Bioengineering Institute, The University of Auckland, New Zealand

18.20 *C-3:L07* **Transparent Ionic Polymer Actuators Based on SPI Membranes and Graphene Electrodes**
JIN-HAN JEON, IL-KWON OH, Division of Ocean Systems Engineering, School of Mechanical Aerospace and Systems Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

18.40 *C-3:L08* **EAP-Actuators with Improved Actuation Capabilities for Construction Elements with Controllable Stiffness**
M. HENKE, J. SORBER, G. GERLACH, TU Dresden, Solid State Electronics Lab, Dresden, Germany

19.00 *C-3:L09* **High Performance Flexible Organic Thin Film Transistors with Conducting Polymer Electrodes and Al2O3/ PVP/Al2O3 Multilayer Insulator**
YOUNGKYU LEE, R. ABDUR, H. SOH, J. LEE, Kookmin university, Seoul, South Korea

Session D-3 - Functionality, Manufacturing, Application

Room: **ALBA 2**

Chair: Jean LUPRANO, Switzerland

15.00 *D-3:IL11* **Bio-inspired Fiber-based Probes**
K. KORNEV, Clemson University, Clemson, SC, USA

15.30 *D-3:IL12* **MerinoGold - Nanogold as a Novel Colourant and Functional Entity in Wool for High Value Textiles and Fashion Apparel**
J.H. JOHNSTON, K.A. Lucas, School of Chemical and Physical Sciences, MacDiarmid Institute for Advanced Materials and Nanotechnology, Victoria University of Wellington, Wellington, New Zealand

16.00 *D-3:L13* **Durable Self-healing Super-liquid-repellent Fabrics**
TONG LIN, Centre for Material and Fibre Innovation, Deakin University, Geelong, VIC, Australia

16.20 *D-3:L14* **Improving Colourfastness and Mitigating Photo-degradation in Wool**
K. LUCAS, J. JOHNSTON, School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand

16.40 *Break*

Chair: James JOHNSTON, New Zealand

17.10 *D-3:L15* **A Classified Catalogue for Textile-based Sensors**
P. BOSOWSKI, C. BRECKENFELDER, S. JOCKENHÖVEL, Institut für Textiltechnik der RWTH Aachen, Aachen, Germany

17.30 *D-3:IL16* **Thigmo-morphogenetic Fiber Composites Embedded with Shape Memory Alloys**
M. MINGALLON, Arup & The Architectural Association, London, UK; S. RAMASWAMY, KRR & The Architectural Association, London, UK

18.00 *D-3:IL17* **Superhydrophobic Textiles - 75 Years of Smart Textiles**
S. MICHIELSEN, Department of Textile Engineering, Chemistry, and Sience College of Textiles, North Carolina State University, Raleigh, NC, USA

Room: **SIRIO**

Session E-6 - Energy Harvesting and Power Supply MEMS

Chair: Ivo RENDINA, Italy

15.00 *E-6:IL01* **Nanogenerators for Self Powered Sensors and Systems**
Z.L. WANG, Wang School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA, USA

15.30 *E-6:IL02* **Development of Microscale Thermoelectric Modules for Energy Conversion**
JING-FENG LI, DA-WEI LIU, State Key Laboratory of New Ceramics and Fine Processing, Department of Materials Science and Engineering, Tsinghua University, Beijing, China

16.00 *E-6:IL03* **Advances in Micromachined Vibration Energy Harvesting Using Piezoelectric Materials**
D.-J. KIM, S.-B. KIM, H.C. WIKLE, Auburn University, AL, USA; J.-H. PARK, Argonne National Lab, IL, USA; S.-H. KIM, Brown University, RI, USA

16.30 *E-6:IL04* **Energy Harvesting from Air Flow**
A.S. HOLMES, Imperial College London, London, UK

17.00 *Break*

Session E-3 - MOEMS / NOEMS

Chair: Christofer HIEROLD, Switzerland

17.30 *E-3:IL01* **Micromachined Devices for Use in Terahertz Applications**
D. WOOD, J.M. CHAMBERLAIN, A.J. GALLANT, A.J. BARAGWANATH, L.E. DODD, C.K.A. HILL, School of Engineering and Computing Sciences, Durham University, Durham, UK

18.00 *E-3:IL02* **Micro and Nanophotonics in Silicon**
I. RENDINA, G. COPPOLA, M. GIOFFRE', M. IODICE, L. DE STEFANO, V. MOCELLA, L. SIRLETO, M. CASALINO, P. DARDANO, E. DE TOMMASI, A. FERRARA, I. REA, National Council of Research, Institute for Microelectronics and Microsystems, Napoli, Italy

18.30 *E-3:L03* **Powerful Polymer/Silicon Composite Thermal Microactuator for MOEMS Applications**
B. THUBTHIMTHONG, **G.K. LAU**, V.M. MURUKESHAN, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

Room: **LE PLEIADI**

Session G-3 - Smart Structures and Integrated Systems

Chair: Ayech BENJEDDOU, France / Fabrizio VESTRONI, Italy

15.00 *G-3:IL09* **High Precision Adaptive and Morphing Structures**
H. BAIER, Institute of Lightweight Structures, TU München, Garching, Germany

15.30 *G-3:IL10* **Bistable Structures for Use in Morphing Applications**
D.J. WAGG, Department of Mechanical Engineering, University of Bristol, Bristol, UK

16.00 *G-3:IL11* **Deployable Structures**
A.E. DEL GROSSO, University of Genoa, Genoa, Italy; P. BASSO, University of Pavia, Pavia, Italy

16.30 *G-3:IL12* **Integration of Piezoelectric Components in Composite Structures**
A. BENJEDDOU, Supméca, Saint Ouen Cedex, France

17.00 *Break*

Special Session G-6 - Advances and Challenges in the SHM of Civil and Aerospace Structures

Chair: P. RIZZO, USA *(Programme Chair)*

17.25 *Welcome by Programme Chair*

17.30 *G-6:IL01* **Ultrasonic Guided Wave Monitoring of Railroad Tracks**
F. LANZA DI SCALEA, C. NUCERA, R. PHILLIPS, University of California, San Diego, La Jolla, VA, USA

18.00 *G-6:IL02* **NDE/SHM of Underwater Structures: A Review**
P. RIZZO, Department of Civil and Environmental Engineering, University of Pittsburgh, Pittsburgh, PA, USA

18.50 *G-6:L04* **Magnetic Flux Leakage (MFL) Sensing-based Steel Cable NDE Technique Incorporated on a Cable Climbing Robot for Bridge Structures**
SEUNGHEE PARK[1], JU-WON KIM[2], MIN-JUN NAM[2], JONG-JAE LEE[3], [1]Dept. of Civil and Environmental Engineering, Sungkyunkwan University, Suwon, Korea; [2]Dept. of u-City Design and Engineering, Sungkyunkwan University, Suwon, Korea; [3]Dept. of Civil and Environmental Engineering, Sejong University, Seoul, Korea

19.10 *G-6:L05* **Structural Element with Non-homogene Fiberconcrete Distribution in the Volume Building Technology Process and Strength**
A. KRASNIKOVS, O. KONONOVA, V. LAPSA, A. PUPURS, Riga Technical University, Riga, Latvia

Room: **SMERALDO 2**

Session H-3 - Bio-inspired Sensors and Actuators

Chair: Ki-Hun JEONG, Korea

15.00 *H-3:L06* **Material Properties and Evaluation of Sensitivity of Photomechanic Infrared Receptors in Pyrophilous Insects**
H. SCHMITZ, A. SCHMITZ, D. KLOCKE, Institute of Zoology, University of Bonn, Germany; H. BOUSACK, Peter Grünberg Institute, Forschungszentrum Juelich, Germany

15.20 *H-3:L08* **Detection of Salmonella Using Bio-inspired Autonomous Sentinels**
S. LI, H.C. WIKLE, III, **B.A. CHIN**, Materials Research & Education Center, Auburn University, Auburn, AL, USA

15.40 *H-3:IL09* **Actuator-like Hydrogels Based on Conductive Chitosan**
J. DESBRIERES, S. REYNAUD, P. MARCASUZAA, F. EHRENFELD, Université de Pau et des Pays de l'Adour (UPPA) - IPREM/EPCP - UMR 5254 CNRS/UPPA - Helioparc Pau Pyrenees, Pau cedex, France

16.10 *H-3:L11* **Use of Textile Friction to Mimic Hill's Model in Dynamic Contraction of Braided Artificial Muscles**
B. TONDU, CNRS-LAAS and University of Toulouse, Toulouse, France

16.30 *Break*

Session H-5 - Biomolecular Computing

Chair: Henry HESS, USA

17.00 *H-5:IL01* **Progress in Molecular Computing**
M.N. STOJANOVIC, Department of Medicine, Columbia University, Fort Lee, NJ, USA

17.30 *H-5:IL02* **Molecular Theory of Biointerfaces**
I. SZLEIFER, Department of Biomedical Engineering, Northwestern University, Evanston, IL, USA

18.00 *H-5:IL03* **Driving DNA Nanodevices with in Vitro Transcription Circuits**
E. FRANCO, University of California, Riverside, CA, USA; J. KIM, R. MURRAY, E. WINFREE, Caltech, CA, USA; M. WEITZ, E. FRIEDRICHS, **F. SIMMEL**, TU München, Garching, Germany

Session H-2.2 - Functional Bio-inspired Surfaces

Room: **TURCHESE**

Chair: Bharat BHUSHAN, USA

15.00 *H-2.2:IL01* **Reconstructing Synthetic Cellular Compartments on a Surface**
R. BAR-ZIV, Department of Materials and Interfaces, The Weizmann Institute of Science, Rehovot, Israel

15.30 *H-2.2:IL03* **Bioinspired Assembly of Superparamagnetic Nanoparticle Membranes**
E. REIMHULT, Laboratory for Biologically Inspired Materials, Department of Nanobiotechnology, University of Natural Resources and Life Sciences (BOKU) Vienna, Austria

16.00 *H-2.2:IL04* **Biomimetic Self-organized Functional Surface Materials**
M. SHIMOMURA, Tohoku University, Katahira, Sendai, Japan

16.30 *H-2.2:L05* **Smart Skin Pattern of Springtails - Robust Omniphobic Surfaces in Nature**
R. HENSEL[1], R. HELBIG[1], S. ALAND[2], C. WERNER[1, 3], [1]Max Bergmann Centre of Biomaterials, Leibniz Institute of Polymer Research Dresden, Dresden, Germany; [2]Department of Mathematics, Technische Universität Dresden, Dresden, Germany; [3]B CUBE Innovation Centre for Molecular Bioengineering, Technische Universität Dresden, Dresden, Germany

16.50 *H-2.2:L06* **Bio-inspired Surface Structures to Control Wettability and Ice Accumulation**
B. HATTON, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, USA

Room: **SMERALDO 3**

Chair: Thomas J. WEBSTER, USA

Session J-4 - Tissue Engineering and Regenerative Medicine

15.30 *J-4:IL06* **Enzyme-mediated Injectable Biodegradable Hydrogel for Biomedical Applications**
N. KURISAWA, Institute of Bioengineering and Nanotechnology, Singapore

16.00 *J-4:L08* **Responsive Biomaterials for Dynamic Cell Culture and Regenerative Medicine**
A.M. KLOXIN, Department of Chemical Engineering and Department of Materials Science and Engineering, University of Delaware, Newark, DE, USA

16.20 *J-4:L09* **Morphological Optimization of Silk Fibroin Electrospun Nanofibers for Wound Healing Enhancement**
J. CHUTIPAKDEEVONG, P. SUPAPHOL, Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand; U. RUKTANONCHAI, National Nanotechnology Center, NSTDA, Thailand Science Park, Pathumthani, Thailand

16.40 *Break*

Chair: Vinod LABHASETWAR, USA

Session J-5 - Targeted Delivery and Release Systems

17.10 *J-5:IL02* **Molecular Chaperon Inspired Biomaterials for Protein Delivery**
K. AKIYOSHI, Department of Polymer Chemistry, Kyoto University, Kyoto, Japan

17.40 *J-5:L03* **Synthesis, Stability, and Release Processes of Submicron Vaterite Containers in Biological Media**
B. PARAKHONSKIY[1,3], A. HAASE[1], F. TESSAROLO[1], R. ANTOLINI[1], F. PICCOLI[2], [1]BIOtech - Interdipartimental Center for Biomedical Technologies, University of Trento, Trento, Italy; [2]Section of Electron Microscopy, Department of Laboratory Medicine, APSS, Trento, Italy; [3]A.V. Shubnikov Institute of Crystallography, Russian Academy of Science, Moscow, Russia

Session A-7 - Smart Molecular and Sopramolecular Systems, Metallorganic Frameworks and Coordination Polymers

Room: **AUDITORIUM**

Chair: Shuhei FURUKAWA, Japan

9.00 *A-7:IL02* **Hydrazone-based Rotary Switches**
I. APRAHAMIAN, Dartmouth College, Hanover, NH, USA

9.30 *A-7:L03* **Bistability in Neutral Radical Dyads:Towards Multifunctional Molecular Switching Materials**
J. GUASCH[1], L. GRISANTI[2], G. D'AVINO[2], **I. RATERA**[1], A. PAINELLI[2], C. ROVIRA[1], J. VECIANA[1], [1]Institut de Ciencia de Materials de Barcelona (CSIC)/CIBER-BBN, Spain; [2]Dipart. Chimica GIAF, Parma University, Parma, Italy

9.50 *A-7:L04* **Adaptive Porous materials for Gas Storage Application**
K. KONSTAS[1], J.W. TAYLOR[1], C.M. DOHERTY[1], A.W. THORNTON[1], T.J. BASTOW[1], A.J. HILL[2], M. HILL[1], [1]CSIRO Material Science and Engineering, [2]CSIRO Process Science and Engineering, Clayton, Victoria, Australia

10.10 *A-7:L05* **Light-activated Healing of Metallosupramolecular Polymers**
G.L. FIORE[1], M. BURNWORTH[2], S.J. ROWAN[2], C. WEDER[1], [1]Adolphe Merkle Institute and Fribourg Center for Nanomaterials, University of Fribourg, Fribourg, Switzerland; [2]Department of Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, OH, USA

10.30 *Break*

Chair: Zhong Yang CHENG, USA

11.00 *A-7:IL06* **Self-propagating Molecular Assemblies**
M.E. VAN DER BOOM, Department of Organic Chemistry, Weizmann Institute of Science, Rehovot, Israel

11.30 *A-7:IL07* **Sequential Functionalization of Porous Coordination Polymers**
S. FURUKAWA, Institute for Integrated Cell-Material Sciences, Kyoto University, Kyoto, Japan

12.00 *A-7:L08* **Size and Morphology Controlled Formation of Porous Coordination Polymers**
S. DIRING, S. FURUKAWA, S. KITAGAWA, Institute for Integrated Cell-Material Sciences, Kyoto University, Kyoto, Japan

12.20 *A-7:L10* **Comparative Study of Automated Adsorption of Commercial Dyes Using Metal-organic Frameworks (MOFs)**
D. LOPEZ MALO, K.A. WANDERLEY, G.F. DE SÁ, S.A. JÚNIOR, Departamento de Química Fundamental, CCEN - UFPE, Cidade Universitária, Recife, PE, Brazil

Session A-8 - Adaptive / Responsive Surfaces and Multifunctional Smart Coatings

Room: **VENERE**

Chair: Jan GENZER, USA

9.00 *A-8:IL01* **Growing Integration Layer [GIL] Strategy: Direct Fabrication of Compositionally, Structurally and Functionally Graded Ceramic Films and/or Coatings from Mother Materials in Solution**
M. YOSHIMURA, Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan; Prof. Emeritus, Tokyo Institute of Technology, Japan

9.30 *A-8:IL03* **Bio-inspired, Smart, Multiscale Interfacial Materials**
L. JIANG, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China

10.00 *A-8:IL04* **Stimuli-responsive Periodic Micro Structures on Oxide-polymer Hybrid Films**
M. TAKAHASHI, Y. TOKUDOME, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka, Japan

10.30 *Break*

Chair: Masahide TAKAHASHI, Japan

11.00 *A-8:IL05* **Responsive Materials Based on Silicone Elastomer Networks**
J. GENZER, North Carolina State University, Raleigh, NC, USA

11.30 *A-8:L06* **Hydrophilic and UV-shielding Protective Films Containing TiO2@SiO2 Hybrid Nanoparticles**
JUNG WHAN YOO, Korea Institute of Ceramic Engineering and Technology, Korea; HYEONG SEOK LEE, Hanyang University, Korea; SE MI IM, Inha University, Korea

11.50 *A-8:L07* **Wearable Sensors Based on a pH-responsive Hybrid Layer from Water Borne Carbon Nanotubes, pH-sensitive Polymers and Film-forming Latex**
V. CASTELVETRO, S. BIANCHI, M. GROSSI, N. CALISI, F. DI FRANCESCO, Dipartimento di Chimica e Chimica Industriale, Pisa, Italy

12.10 *A-8:L08* **Design and Development of Self-stratifying Polymers and Coatings**
J. BAGHDACHI, H. PEREZ, P. TALAPATCHAROENKIT, Coatings Research Institute, Eastern Michigan University, Ypsilanti, MI, USA

Room: **ZENITH**

Session A-11.3 - Dynamics of Multiferroics & Structural Characterization

Chair: Evnegy TSYMBAL, USA

9.00 *A-11.3:IL01* **Terahertz Emission from BiFeO3 Thin Films**
M. TONOUCHI, Institute of Laser Engineering, Osaka University, Suita, Japan

9.30 *A-11.3:IL03* **Ferroelectric and Multiferroic Tunnel Junctions**
A. CRASSOUS[1], **V. GARCIA**[1, 2], M. BIBES[1], A. CHANTHBOUALA[1], S. FUSIL[1], K. BOUZEHOUANE[1], E. JACQUET[1], L. BOCHER[3], A. GLOTER[3], C. DERANLOT[1], S. XAVIER[4], S. ENOUZ-VEDRENNE[4], N. MATHUR[2], A. BARTHÉLÉMY[1], [1]Unité Mixte de Physique CNRS/ Thales, Palaiseau, France; [2]University of Cambridge, Cambridge, UK; [3]Laboratoire de Physique des Solides, Université Paris Sud, Orsay, France; [4]Thales Research and Technology, Palaiseau, France

10.00 *A-11.3:IL04* **Study of Strain-induced Morphotropic Phase Boundary in Multiferroic BiFeO3 Thin Films**
LANG CHEN, School of Materials Science and Engineering, Nanyang Technological University, Singapore

10.30 *Break*

Session A-11.4 - New Effects

Chair: Vincent GARCIA, France

11.00 *A-11.4:IL01* **Electrically-controlled Atomic Spin-valve at a Complex Oxide Interface**
J.D. BURTON, **E.Y. TSYMBAL**, Department of Physics and Astronomy, University of Nebraska, Lincoln, NE, USA

11.30 *A-11.4:IL02* **Functionally Graded Magnetoelectric Composites**
G. SRINIVASAN, G. SREENIVASULU, V.M. PETROV, Physics Department, Oakland University, Rochester, MI, USA

12.00 *A-11.4:IL03* **Domain Walls and Photovoltaic Effect in BiFeO3**
M. ALEXE, Max Planck Institute of Microstructure Physics, Halle, Germany

12.30 *A-11.4:L04* **Free Charge Contribution to Dielectric Behavior of Oxides**
R. ANAND THEERTHAN, M. MAGLIONE, ICMCB, University Bordeaux 1, Pessac, France

Room: **ORSA MAGGIORE**

Session A-12.5 - Acoustic and Seismic Metamaterials

Chair: Mikhail LAPINE, Australia/Russia

9.00 *A-12.5:IL01* **Acoustic Magnifying Hyperlens**
JENSEN LI, Department of Physics and Materials Science, City University of Hong Kong, Hong Kong

9.30 *A-12.5:IL02* **Zero Acoustic Transmittance through Holey Structures**
J.S. BELL, A.R.J. MURRAY, E. HENDRY, **A.P. HIBBINS**, I.R. SUMMERS, J.R. SAMBLES, University of Exeter, Exeter, UK

10.00 *A-12.5:IL03* **Negative Effective Gravity in Water Waves**
X.H. HU[1], C.T. CHAN[2], K.M. HO[3], J. ZI[4], [1]Department of Materials Science, Laboratory of Advanced Materials, and Key Laboratory of Micro and Nano Photonic Structures (Ministry of Education), Fudan University, Shanghai, China; [2]Department of Physics, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong, China; [3]Ames Laboratory and Department of Physics and Astronomy, Iowa State University, Ames, Iowa, USA; [4]Department of Physics and Key Laboratory of Surface Physics, Fudan University, Shanghai, China

10.30 *Break*

Session A-12.6 - Novel Concepts in Metamaterials

Chair: Alastair P. HIBBINS, UK

11.00 *A-12.6:IL02* **Generalized Framework for Designing PhoXonic (x=n,t) Metamaterial Networks: Defects, Edge, Surfaces and More**
CHEONG YANG KOH, DSO National Laboratories, Singapore

11.30 *A-12.6:IL03* **Metamaterials with Conformational Nonlinearity and Tunability**
M. LAPINE, Nonlinear Physics Centre, Australian National University, Canberra, Australia; Dept. Photonics and Optoinformatics, NRU ITMO, St.Petersburg, Russia

12.00 *A-12.6:L04* **Patterned Ferrimagnetic Thin Films of Spinel Ferrites Directly Obtained by Laser Irradiation: A Way to Prepare Magnonic Crystals?**
I. PASQUET, L. PRESMANES, C. BONNINGUE, **PH. TAILHADES**, Université de Toulouse, UPS, INP, Institut Carnot CIRIMAT, Toulouse cedex, France and CNRS, Institut Carnot Cirimat, Toulouse, France

Room: **ORSA MINORE**

Session A-13.3 - Electronic, Spintronic, Optical and Sensing Applications

Chair: Luigi COLOMBO, USA

9.00 *A-13.3:IL10* **Graphene-based Molecular Spintronics**
M. AFFRONTE, **A. CANDINI**, C. ALVINO, S3, Istituto Nanoscienze-CNR, Modena, Italy; S. KLYATSKAYA, M. RUBEN, Institute of Nanotechnology (INT), Karlsruhe Institute of Technology (KIT), Germany; W. WERNSDORFER, Institut Néel, CNRS, Grenoble Cedex, France

9.30 *A-13.3:IL11* **Efficient Spintronics with Graphene**
P. SENEOR[1], B. DLUBAK[1], M.-B. MARTIN[1], A. ANANE[1], C. DERANLOT[1], B. SERVET[2], S. XAVIER[2], R. MATTANA[1], M. SPRINKLE[3], C. BERGER[3, 4], W. DE HEER[3], F. PETROFF[1], A. FERT[1], [1]Unité Mixte de Physique CNRS/Thales, Palaiseau and Université Paris-Sud, Orsay, France; [2]Thales Research and Technology, Palaiseau, France; [3]School of Physics, Georgia Institute of Technology, Atlanta, USA; [4]Institut Néel, CNRS, Grenoble, France

10.00 *A-13.3:IL12* **Novel Graphene Based Materials in Optics, Optoelectronics and Photovoltaics**
CHUN-WEI CHEN, Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan

10.30 *A-13.3:L13* **Dielectric-tuned Diamondlike Carbon Materials for a Ultrahigh-speed Self-aligned Graphene Channel Field Effect Transistor**
S. TAKABAYASHI, M. YANG, S. OGAWA, Y. TAKAKUWA, T. SUEMITSU, T. OTSUJI, Tohoku University, Sendai, Japan

10.50 *Break*

Session A-13.4 - Energy Applications

Chair: Vincenzo PALERMO, Italy

11.20 *A-13.4:IL01* **Graphene Layers for Hydrogen Storage**
V. PELLEGRINI, NEST, Istituto Nanoscienze-CNR and Scuola Normale Superiore, Pisa, Italy

11.50 *A-13.4:IL02* **Fabrication of Graphene-based Flexible Energy Storage Devices**
FENG LI, WENCAI REN, **HUI-MING CHENG**, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China

12.20 *A-13.4:L03* **Enhanced Infrared Light Harvesting of PbS Quantum Dot Photovoltaic and Photodetector on Graphene Electrode**
CHIA-CHUN CHEN[1, 2], DI-YAN WANG[3], CHIH-CHENG LIN[3], YOU-TING JIANG[1], CHUN-WEI CHEN[3], [1]Department of Chemistry, National Taiwan Normal University, Taipei, Taiwan; [2]Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan; [3]Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan

Session A-15.6 - Multimaterial Systems

Room: **URANO**

Chair: Christoph WEDER, Switzerland

9.00 *A-15.6:IL01* **Shape Memory Polymer Nanocomposites Research and Applications**
I.S. GUNES[1], G.A. JIMENEZ[2], F. CAO[3], **S.C. JANA**[4], [1]Currently at 3M, Minneapolis, USA; [2]Currently at National University of Costa Rica; [3]Currently at Lubrizol, Brecksville, USA; [4]Department of Polymer Engineering, University of Akron, Akron, OH, USA

9.30 *A-15.6:IL02* **Laminated Shape Memory Elastomeric Composites**
E.D. RODRIGUEZ[1], D.C. WEED[2], **P.T. MATHER**[2], [1]Mechanical and Aerospace Engineering, Syracuse University; [2]Biomedical and Chemical Engineering, Syracuse University, Syracuse, NY, USA

10.00 *A-15.6:IL03* **Multifunctional Shape-memory Polymers**
A. LENDLEIN, Center for Biomaterial Development and Berlin-Brandenburg Center for Regenerative Therapies, Institute of Polymer Research, Helmholtz-Zentrum Geesthacht, Teltow, Germany

10.30 *A-15.6:IL04* **Mechanically Assisted Photolithography**
C. KLOXIN, University of Delaware; Department of Materials Science and Engineering, and Department of Chemical Engineering; Newark, DE, USA

11.00 *Break*

Chair: Hans-Joachim RADUSCH, Germany

11.30 *A-15.6:L05* **Magnetic Field Induced Formation of Magnetic Wires into Thin Elastic Membranes with Controlled Properties**
D. LORENZO, D. FRAGOULI, G.C. ANYFANTIS, Center for Biomolecular Nanotechnologies (CBN) - Italian Institute of Technology (IIT)@UniLe, Arnesano (LE), Italy; C. INNOCENTI, INSTM-RU of Florence and Dept. of Chemistry, University of Florence, Sesto F.no (FI), Italy; G. BERTONI, Italian Institute of Technology (IIT), Genova, Italy; R. CINGOLANI, A. ATHANASSIOU, Center for Biomolecular Nanotechnologies (CBN) - Italian Institute of Technology (IIT)@UniLe, Arnesano (LE), Italy, Italian Institute of Technology (IIT), Genova, Italy

11.50 *A-15.6:IL06* **Mechanically Adaptive Polymer Nanocomposites for Biomedical Implants and other Applications**
C. WEDER, Adolphe Merkle Institute, University of Fribourg, Marly, Switzerland

12.20 *A-15.6:L07* **Thermally-Induced Shape-Memory Effect of Nanocomposites with Poly(omega-pentadecalactone) Switching Segments Under Constant Stress**
M.Y. RAZZAQ, M. BEHL, A. LENDLEIN, Centre for Biomaterial Development, Institute of Polymer Research, Helmholtz-Zentrum Geesthacht, Teltow, Germany

Session A-15.7 - Applications of Actively Moving Polymers

12.40 *A-15.7:L03* **Soft Microorigami: Stimuli-responsive Self-folding Polymer Films**
L. IONOV, Leibniz Institute of Polymer Research, Dresden, Germany

Session B-6 - Applications

Room: **SMERALDO 1**

Chair: Minoru TAYA, USA

9.00 *B-6:IL01* **SMA Dampers for Cable Vibration: An Available Solution for Oscillation Mitigation of Stayed Cables in Bridges**
V. TORRA, A. ISALGUE, CIRG-DFA-UPC, Barcelona, Catalonia, Spain; F. CASCIATI, Structural Mechanics Dept., Pavia University, Italy; S. CASCIATI, University of Catania, Siracusa, Italy; P. TERRIAULT, Dep. Genie Mecanique, ETS, Montreal, Quebec, Canada

9.30 *B-6:IL02* **Thermoelastic Cooling**
I. TAKEUCHI, Y. WU, Univ. of Maryland, College Park, MD, USA; J. CUI, Univ. of Maryland, College Park, MD, USA and Pacific Northwest National Lab, Richland, WA, USA

10.00 *B-6:IL03* **Devices for Rehabilitation Applications**
S. PITTACCIO, S. VISCUSO, L. GARAVAGLIA, National Research Council of Italy, Institute for Energetics and Interphases, Lecco, Italy

10.30 *B-6:IL04* **Smart Microactuation Devices Based on Shape Memory and Magnetic Effects**
M. KOHL, B. KREVET, C. MEGNIN, V. PINNEKER, S.R. YEDURU, Karlsruhe Institute of Technology, Institute of Microstructure Technology, Karlsruhe, Germany

11.00 *Break*

Chair: Ichiro TAKEUKI, Japan

11.30 *B-6:L06* **SMA Applications in Space Engineering: State-of-the-Art**
A. RAZOV, Saint-Petersburg University, Saint-Petersburg, Russia

11.50 *B-6:L07* **Design of a Solid State Shape-Memory-Actuator with Guidance Functionality**
K. PAGEL, A. BUCHT, W.-G. DROSSEL, R. NEUGEBAUER, Fraunhofer Institute for Machine Tools and Forming Technology, Dresden, Saxony, Germany

12.10 *B-6:L08* **An Open-loop Control Approach for Magnetic Shape Memory Actuators Considering Temperature Variations**
K. SCHLÜTER, A. RAATZ, Technische Universität Braunschweig, Braunschweig, Germany; L. RICCARDI, Politecnico di Bari, Bari, Italy

12.30 *B-6:L09* **Studies on Internal Friction of a High Temperature Cu-Al-Mn-Zn Shape Memory Alloy**
V. SAMPATH, P. CHANDRAN, Department of Metallurgical and Materials Engineering, Indian Institute of Technology, Madras, Chennai, India

Session D-3 - Functionality, Manufacturing, Application

Room: **ALBA 2**

Chair: Katerina KREBBER,Germany

9.00 *D-3:IL21* **Fabric Optoelectronics Enabling Healthcare Applications**
F. VAN ABEELEN, K. CHERENACK, S. LUITJENS, G. ZHOU, **K. VAN OS**, Philips Research, Eindhoven, The Netherlands

9.30 *D-3:IL22* **Advances in Physiological and Psychological Monitoring with e-textiles**
R. PARADISO, Smartex srl, Prato, Italy

10.00 *D-3:L23* **Respiratory Volume Estimation by a Stretchable Textile Sensor**
Y. ENOKIBORI, Y. ITO, Graduate School of Information Science, Nagoya University, Nagoya, Aichi, Japan; K. IKEDA, A. SUZUKI, Tsuchiya Co., Ltd., Chiryu, Aichi, Japan; Y. SHIMAKAMI, Owari Textile Research Center, AITEC, Ichinomiya, Aichi, Japan; T. KAWABE, Department of Medical Teachnology, Nagoya University School of Health Sciences, Nagoya, Aichi, Japan; K. MASE, Graduate School of Information Science, Nagoya University, Nagoya, Aichi, Japan

10.20 *D-3:L24* **Structural Conformability and Fluid Uptake Properties of Smart Wound Dressings**
M. UZUN, S.C. ANAND, T. SHAH, Institute for Materials Research and Innovation, The University of Bolton, Bolton, UK

10.40 *Break*

Chair: Cosimo CARFAGNA, Italy

11.10 *D-3:L25* **Washable Screen Printed Textile Antennas**
I. KAZANI[1], M.L. SCARPELLO[2], C. HERTLEER[1], H. ROGIERI[2], G. DE MEY[3], G. GUXHO[4], L. VAN LANGENHOVE[1], [1]Ghent University, Department of Textiles, Zwijnaarde, Belgium; [2]Ghent University, Department of Information Technology, Gent, Belgium; [3]Ghent University, Department of Electronics and Information Systems, Gent, Belgium; [4]Polytechnic University of Tirana, Department of Textile and Fashion, Tirana, Albania

11.30 *D-3:IL26* **Smart Textiles with Biosensing Capabilities**
S. PASCHE, B. SCHYRR, B. WENGER, E. SCOLAN, R. ISCHER, **G. VOIRIN**, CSEM Centre Suisse d'Electronique et de Microtechnique SA, Neuchâtel, Switzerland

12.00 *D-3:IL27* **Smart Technical Textiles Based on Fibre Optic Sensors: Technologies and Applications**
K. KREBBER, BAM Federal Institute for Materials Research and Testing, Berlin, Germany

Room: **SIRIO**

Session E-7 - Micro(nano)fluidics / Lab on Chip / Bio-MEMS

Chair: Hiroaki SUZUKI, Japan

9.00 *E-7:IL01* **Integrated Photonics for Bioanalytical Microsystems**
J.S. WILKINSON, Optoelectronics Research Centre, University of Southampton, Southampton, Hampshire, UK

9.30 *E-7:IL02* **Labs-on-a-Chip for Medical Applications**
A. VAN DEN BERG, University of Twente, The Netherlands

10.00 *E-7:L04* **Microfluidic Microchemomechanical Systems**
R. GREINER, M. ALLERDISSEN, **A. RICHTER**, TU Dresden/ Heisenberg, Polymere Mikrosysteme, Dresden, Germany

10.20 *Break*

Chair: L. LORENZELLI, Italy

10.50 *E-7:L05* **Micro Electrode Arrays for Single Site Electroporation**
C. COLLINI, **E. MORGANTI**, L. LORENZELLI, FBK-CMM, Trento, Italy; L. VIDALINO, P. MACCHI, CIBIO - University of Trento, Italy

11.10 *E-7:L08* **Hydrogel-based Microfluidic Systems**
M. ALLERDISSEN, S. KLATT, R. KÖRBITZ, A. RICHTER, Chair of Polymeric Microsystems, Dresden University of Technology, Germany

11.30 *E-7:L09* **Superhydrophilic PDMS and PET for Microfluidic Devices**
R. BARTALI, L. LORENZELLI, N. LAIDANI, M. SCARPA, V. MICHELI, A. PEDRANA, A. GAMBETTI, G. GAMBETTI, R. PANDIYAN, S. ROWLEY, I. LUCIU, Fondazione Bruno Kessler, Trento, Italy

Session E-8 - Flexible MEMS Technology

11.50 *E-8:IL02* **Continuous Process for Large-area Flexible MEMS**
T. ITOH, AIST, Tsukuba, Japan

12.20 *E-8:IL04* **Smart Tubes for Smart Systems**
O.G. SCHMIDT, Institute for Integrative Nanosciences, IFW Dresden, Dresden, Germany

Room: **GIOVE**

Session F-6 - Smart Optics Applications

Chair: Maurizio FERRARI, Italy

9.00 *F-6:IL01* **In-vivo Electrical Sensing of Neural Activity and Smart Optics Application in the Brain**
HARGSOON YOON, Norfolk State University, Norfolk, VA, USA

9.30 *F-6:IL02* **WGM Microresonators for Biosensing**
S. SORIA, CNR-IFAC Instituto di Fisica Applicata "N. Carrara", Sesto Fiorentino (FI), Italy

10.00 *F-6:IL03* **Development of a Micro-spectrometer for Neural Probe-pin Devices**
SANG H. CHOI, NASA Langley Research Center Hampton, VA, USA; KYO D. SONG, HARGSOON YOON, Department of Engineering, Norfolk State University, Norfolk, VA, USA; YEONJOON PARK, National Institute of Aerospace Hampton, VA, USA; UHN LEE, Gacheon University of Medicine and Science, Incheon, Korea

10.30 *Break*

Session F-7-Adaptive Optics for Biological Applications

Chair: Sylvain GIGAN, France

11.00 *F-7:IL01* **Adaptive Optics for Microscopic Imaging of the Eye**
A. ROORDA, University of California, Berkeley, CA, USA

11.30 *F-7:IL02* **Implementation of Adaptive Optics of Non-linear Microscopy to Biological Samples Using Optimisation Algorithms**
J.M. GIRKIN, Biophysical Sciences Institute, Department of Physics, Durham University, Durham, UK

12.00 *F-7:IL04* **Use Sensor-less Adaptive Optics to Extend Imaging Depth**
YAOPENG ZHOU, Abbott Laboratories, Princeton, NJ, USA

Session G-5 - Ongoing and Perspective Applications

Room: **LE PLEIADI**

Chair: Lucia FARAVELLI, Italy / Yi-Qing NI, Hong Kong

9.00 *G-5:IL01* **Recent Advances in Active Structural Control Strategies for Civil Engineering Applications**
S. CASCIATI[1], Z.-C. CHEN[2], U. YILDIRIM[2], [1]Department DARC, University of Catania, Siracusa, Italy; [2]Department of Structural Mechanics, University of Pavia, Pavia, Italy

9.30 *G-5:IL03* **Structural Control Issues in New Generation Offshore Wind Energy Plants**
NINGSU LUO, Institute of Informatics and Applications, University of Girona, Girona, Spain

10.00 *G-5:IL05* **Assistive Knee Braces with Multifunctional Actuators**
WEI-HSIN LIAO, Department of Mechanical and Automation Engineering, The Chinese University of Hong Kong, Shatin, NT, Hong Kong

10.30 *Break*

11.00 *G-5:IL07* **Structural Health Monitoring of a Tall Building with Huge Floating Platform**
YI-QING NI, Y.X. XIA, H.F. ZHOU, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

11.30 *G-5:L08* **Development of a Visualized Data Management System for Life-cycle Health Monitoring of Civil Structures**
K.C. LIN[1], Y.Q. NI[1], X.W. YE[1], K.Y. WONG[2], [1]Department of Civil and Structural Engineering, The Hong Kong Polytechnic University, Hong Kong; [2]Bridge & Structures Division, Highways Department, The Government of The Hong Kong Special Administrative Region, Hong Kong

11.50 *G-5:L09* **Magnetic Shape Memory Actuators and their Applications for Rotor Systems**
K. MAJEWSKA[1], M. KRAWCZUK[1, 2], W. OSTACHOWICZ[1, 3], A. ZAK[1], [1]Institute of Fluid Flow Machinery of PASci, Gdansk, Poland; [2]Technical University of Gdansk, Gdansk, Poland; [3]Gdynia Maritime University, Gdynia, Poland

Session H-4 - Biologically Inspired Systems and Robotics

Room: **SMERALDO 2**

Chair: Ioannis A. IEROPOULOS, UK

9.00 *H-4:IL06* **A Soft Robot Inspired to the Octopus**
C. LASCHI, M. CIANCHETTI, L. MARGHERI, M. FOLLADOR, M. CALISTI, P. DARIO, The BioRobotics Institute, Scuola Superiore Sant'Anna, Pisa, Italy; B. MAZZOLAI, Center for Micro-BioRobotics of IIT@SSSA, Pontedera (Pisa), Italy

9.30 *H-4:IL07* **Biomechanics in Bio-flights and its Application to Bio-inspired Robots**
HAO LIU[1, 2], T. NAKATA[1], N. GAO[3], M. MAEDA[1], [1]Graduate School of Engineering, Chiba University, Chiba, Japan; [2]Shanghai Jiao Tong University and Chiba University International Cooperative Research Center; [3]Sumitomo Heavy Industries, Ltd., Japan

10.00 *H-4:IL08* **Emergent Functionality of Cellular Buildup Wet Robotics**
K. MORISHIMA, Department of Mechanical Engineering, Osaka University, Suita, Japan

10.30 *Break*

Chair: Hiroyuki ASANUMA, Japan

11.00 *H-4:IL09* **Bio-inspired Strategies for Effective Navigation in Complex Chemical Plumes**
M.J. WEISSBURG, School of Biology, Georgia Inst. Technology, Atlanta, GA, USA; K.Y. VOLYANSKYY, D.R. WEBSTER, School of Civil and Environmental Engineering, Georgia Inst. Technology, Atlanta, GA, USA

11.30 *H-4:IL10* **Energetically Autonomous Robots: EcoBot (Artificial Symbiosis for Self-sustainability)**
I.A. IEROPOULOS, J. GREENMAN, C.R. MELHUISH, I.R. HORSFIELD, Bristol Robotics Laboratory, Bristol, UK; UWE, Bristol, UK

12.00 *H-4:IL11* **Underwater Adhesive Systems for Robotic Applications**
N. HOSODA, Interconnect Design Group, Hybrid Materials Unit, National Institute for Materials Science, Japan; S.N. GORB, Department of Functional Morphology and Biomechanics, Zoological Institute at the University of Kiel, Germany

12.30 *H-4:L12* **Design and Application of Smart Soft-morphing Structure for Bio-mimetic Underwater Robot: Turtle-like Robot**
S.H. SONG, M.W. HAN, K.T. LEE, School of Mechanical and Aerospace Engineering, Seoul National University, Seoul, Korea; H.J. KIM, Doosan Infracore Institute of Technology, Gyeonggi-Do, Korea; S.H. AHN, School of Mechanical and Aerospace Engineering & Institute of Advanced Machinery and Design, Seoul National University, Seoul, Korea

Room: **TURCHESE**

Session I-5 - Healthcare Applications

Chair: Toshiyo TAMURA, Japan

9.00 *I-5:IL01* **Capturing Surrogate Signs - The Role of BSN for Disease and Rehabilitation Management**
GUANG-ZHONG YANG, The Hamlyn Centre, Imperial College London, UK

9.30 *I-5:IL02* **Remote Monitoring for Chronic Disease Management**
M. SARRAFZADEH, UCLA, Computer Science Department, Los Angeles, CA, USA

10.00 *I-5:IL03* **Brain Computer Interfaces for Spinal Injured Patients**
H. LAKANY, University of Strathclyde, Department of Bioengineering, Glasgow, UK

10.30 *Break*

Chair: Heba LAKANY, UK

11.00 *I-5:L04* **Smart Healthcare Textile Sensor System for Pervasive Realtime Health Monitoring**
P. RAI, P. SHYAMKUMAR, S. OH, H. KWON, G.N. MATHURA, V.K. VARADAN, M.P. AGARWAL, Dept. of Electrical Engineering, University of Arkansas, Fayetteville, Arkansas, USA; Biomedical Engineering, University of Arkansas, Fayetteville, Arkansas, USA; Global Institute of Nanotechnology, Fayetteville, Arkansas, USA

11.20 *I-5:IL05* **Wearable Inertia Sensor Application in the Rehabilitation Field**
T. TAMURA, M. SEKINE, H. MIYOSHI, Y. KUWAE, T. FUJIMOTO, Chiba University, Graduate School of Engineering, Chiba, Japan

Session I-4 - Energy Harvesting, Sensor Networks, Signal Processing, Data Transmission

11.50 *I-4:IL09* **Ultra Low Power Signal Processing for Wearable Computers**
R. JAFARI, The University of Texas at Dallas, Richardson, TX, USA

Session J-5 - Targeted Delivery and Release Systems

Room: **SMERALDO 3**

Chair: Jackie Y. YING, Singapore

9.00 *J-5:IL04* **Nanoparticle-mediated Drug Delivery: Biophysical Interactions to Therapeutic Applications**
V. LABHASETWAR, Department of Biomedical Engineering, Lerner Research Institute, Cleveland Clinic, Cleveland, OH, USA

9.30 *J-5:IL05* **Stimuli-sensitive Liposomes for Drug Delivery**
K. KONO, Department of Applied Chemistry, Osaka Prefecture University, Sakai, Osaka, Japan

10.00 *J-5:L07* **Hepatocyte-specific Gene Delivery with Galactose-bearing Cationic Polymers with Different Molecular Structures**
M.C. MUNISSO, Y. TACHIBANA, J.H. KANG, T. YAMAOKA, Departments of Biomedical Engineering, National Cerebral and Cardiovascular Center Research Institute, Suita, Osaka, Japan; Y. MIZUTANI, A. MURAKAMI, Graduate School of Science and Technology, Biomolecular Engineering, Kyoto Institute of Technology, Matsugasaki, Sakyoku, Kyoto, Japan

10.20 *J-5:IL09* **Supramolecular Nanodevices from Functionalized Block Copolymers for Molecular Therapy**
K. KATAOKA, Department of Materials Engineering, Graduate School of Engineering / Center for Disease Biology & Integrated Medicine, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan

10.50 *Break*

Chair: Kazunori KATAOKA, Japan

11.20 *J-5:IL10* **Nanostructure Processing of Advanced Biomaterials and Biosystems**
J.Y. YING, Institute of Bioengineering and Nanotechnology, Singapore

11.50 *J-5:L11* **Development of Novel Polyion Complex Vesicles, "PICsomes", and their Biomedical Applications**
A. KISHIMURA, Y. ANRAKU, S. CHUANOI, W. KAWAMURA, S. KAKIYAMA, K. KATAOKA, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan

12.10 *J-5:L12* **Enhanced Nanoparticle Delivery Using Fractional Laser Microablation of Skin**
V.V. TUCHIN[1, 2, 3], E.A. GENINA[1], L.E. DOLOTOV[1], A.N. BASHKATOV[1], E.A. ZUBKINA[1], I.V. YAROSLAVSKY[4], G.B. ALTSHULER[4], [1]Research and Educational Institute of Optics and Biophotonics, N.G. Chernyshevsky National Research Saratov State University, Saratov, Russia; [2]Institute of Precise Mechanics and Control RAS, Russia; [3]University of Oulu, Finland; [4]Palomar Medical Technology Inc., MA, USA

12.30 *J-5:L13* **Specific Targeting of Cell Organelles**
V.P. TORCHILIN, Center for Pharmaceutical Biotechnology and Nanomedicine, Northeastern University, Boston, MA, USA

Room: **VENERE**

Session A-3 - Auxetic Materials

Chair: Ivan APRAHAMIAN, USA

15.00 *A-3:IL01* **Toward Auxetic Shape Memory Liquid Crystalline Elastomers**
W. REN. P.J. MCMULLAN, W.M. KLINE, **A.C. GRIFFIN**, School of Materials Science & Engineering, Georgia Institute of Technology, Atlanta, GA, USA

15.30 *A-3:IL02* **The Use of Auxetic Materials in Smart, Gradient and Multifunctional Systems**
A. ALDERSON, Institute for Materials Research and Innovation, University of Bolton, Bolton, UK

16.00 *A-3:L03* **Auxetic Foam Pads: Experiments and Parameters Identification**
M. GRAVADE, M. OUISSE, **M. COLLET**, FEMTO-ST Applied Mechanics, Besançon, France; F. SCARPA, M. BIANCHI, Advanced Composites Centre for Innovation and Science, Bristol, UK

16.20 *Break*

Session A-5.2 - Chromogenic Material Systems

Chair: Salvatore IANNOTTA, Italy

16.50 *A-5.2:IL06* **Dynamic Coloration Enabled by Polymer/ Cholesteric Liquid Crystal Composites**
M.E. McCONNEY, M. DUNING, L. NATARAJAN, V.P. TONDIGLIA, T.J. WHITE, T.J. BUNNING, Air Force Research Laboratory, Materials and Manufacturing Directorate, WPAFB, OH, USA

17.20 *A-5.2:IL07* **Thermotropic Materials for Adaptive Solar Control**
R. RUHMANN, A. SEEBOTH, O. MUEHLING, D. LOETZSCH, Fraunhofer Institute for Applied Polymer Research, Berlin, Germany

17.50 *A-5.2:L08* **Modeling, Preparation and Characterization of New Fluorophores for Smart Polymer Composite Films**
G. RUGGERI[1], A. PUCCI[1], F. BELLINA[1], M. LESSI[1], L. CARTA[2], C. CAPPELLI[1,2], G. PRAMPOLINI[2], V. BARONE[2], [1]Dept. of Chemistry and Industrial Chemistry, University of Pisa, Pisa, Italy; [2]Scuola Normale Superiore, Pisa, Italy

Session A-11.5 - Devices

Room: **ZENITH**

Chair: Gopalan SRINIVASAN, USA

15.30 *A-11.5:IL01* **Progress in Magnetoelectric Devices Based on Piezoelectric/piezomagnetic Laminated Composites**
SHUXIANG DONG, Peking University, Beijing, China

16.00 *A-11.5:L02* **Tunable BiFeO3-BaTiO3 Thin Film Bulk Acoustic Wave Resonators for Microwave Applications**
A. VOROBIEV, S. GEVORGIAN, Department of Microtechnology and Nanoscience, Chalmers University of Technology, Gothenburg, Sweden; N. MARTIROSYAN, State Engineering University of Armenia, Teryan, Yerevan, Armenia; M. LÖFFLER, E. OLSSON, Department of Applied Physics, Chalmers University of Technology, Gothenburg, Sweden

16.20 *A-11.5:L03* **Strain-dependent Magnetoelectric Properties of Epitaxial CoFe2O4/Pb(Zr1-xTix)O3/SrRuO3 Heterostructures on PMN-PT Substrates**
A. PETRARU[1], N. HOEFT[1], S. ROHIT[1], R. DROOPAD[2], N. PERTSEV[3], H. KOHLSTEDT[1], [1]Nanoelektronik, Technische Fakultät, Christian-Albrechts-Universität zu Kiel, Kiel, Germany; [2]Texas State University, Department of Physics, San Marcos, TX, USA; [3]A.F. Ioffe Physico-Technical Institute, Russian Academy of Sciences, St. Petersburg, Russia

Session A-12.6 - Novel Concepts in Metamaterials

Room: **ORSA MAGGIORE**

Chair: Concita SIBILIA, Italy

15.30 *A-12.6:IL05* **Quantum Levitation**
S. MASLOVSKI, Instituto de Telecomunicaçoes, Universidade de Coimbra, Polo II, Coimbra, Portugal

16.00 *A-12.6:IL06* **Modeling of Time with Metamaterials**
I. SMOLYANINOV, University of Maryland, College Park, MD, USA

16.30 *A-12.6:L07* **Experimental Evidence of Negative Refractive Index in Homogeneous Cr-doped Indium Oxide**
A.-G. KUSSOW[1, 2], A. AKYURTLU[2], [1]Department of Physics, University of Connecticut Storrs, Connecticut, USA; [2]Electrical and Computer Engineering Department, University of Massachusetts Lowell, MA, USA

16.50 *A-12.6:L08* **Use Light to Levitate**
CHENG-WEI QIU, Department of Electrical and Computer Engineering, National Univeristy of Singapore, Singapore

Session A-15.7 - Applications of Actively Moving Polymers

Room: **URANO**

Chair: A. LENDLEIN, Germany

15.00 *A-15.7:IL01* **Shape Memory Polymers for Biomedical Applications**
D.J. MAITLAND, Texas A&M University, College Station, TX, USA

15.30 *A-15.7:IL02* **Synthesis of Shape Memory Polymers for Structural Applications**
I.A. ROUSSEAU, General Motors Company, Warren, MI, USA

16.00 *A-15.7:IL04* **Shape-Memory Polymers as Drug Carrier - Points to be considered**
C. WISCHKE, A. LENDLEIN, Center for Biomaterial Development and Berlin-Brandenburg Center for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany

16.30 *Break*

17.00 *A-15.7:L05* **Electrostrictor with Monolithically Integrated CMOS TFT Control**
F. CARTA, YU-JEN HSU, J. SARIK, I. KYMISSIS, Columbia University, New York, NY, USA

17.20 *A-15.7:L06* **Ethanol Induced Shape Recovery and Swelling in Poly(methyl methacrylate) and Application in Fabrication of Microlens Array**
Y. ZHAO, C.C. WANG, W.M. HUANG, H. PURNAWALI, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

17.40 *A-15.7:L07* **Self-softening, Self-positioning 3D Flexible Bioelectronics Enabled by Shape Memory Polymers**
W. VOIT, The University of Texas at Dallas, Materials Science and Engineering, Mechanical Engineering, Richardson, TX, USA

18.00 *A-15.7:L08* **Multi-functional Shape-memory Polymers and their Composites**
YANJU LIU[1], LIWU LIU[1], HAIBAO LV[2], 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

Session B-3 - Engineering

Room: **SMERALDO 1**

Chair: Tarak BEN ZINEB, France

15.30 *B-3:L10* **Functional Fatigue of NiTi Shape Memory Wires under Assorted Loading Conditions**
G. SCIRE' MAMMANO, **E. DRAGONI**, DISMI - University of Modena and Reggio Emilia, Reggio Emilia, Italy

15.50 *B-3:L12* **Influence of Inclusions on Nitinol Fatigue**
A. CODA, M. URBANO, SAES Getters S.p.A., Lainate, MI, Italy; D. NORWICH, Memry Corp., Bethel, CT, USA; M. MERTMANN, Memry GmbH, Weil am Rhein, Germany; F. SCZERZENIE, SAES Smart Materials, New Hartford, NY, USA

16.10 *B-3:L13* **Transformation Behavior of Shape Memory Alloys in Multiaxial Stress State**
T. YAMAMOTO, A. SUZUKI, H. CHO, T. SAKUMA, Faculty of Engineering, Oita University, Oita, Japan

16.30 *B-3:L14* **Structure and Properties Modification in NiMnGa Single Crystals**
E. PAGOUNIS, M. HELMER, M. MAIER, M. LAUFENBERG, ETO MAGNETIC GmbH, Stockach, Germany

16.50 *Break*

Chair: Stefano BESSEGHINI, Italy

17.20 *B-3:L15* **Modelling of Shape Memory Alloy Negator Springs for Long-Stroke Constant-Force Actuators**
A. SPAGGIARI, E. DRAGONI, DISMI - University of Modena and Reggio Emilia, Reggio Emilia, Italy

17.40 *B-3:L16* **Design and Simulation of a Magnetic Shape Memory (MSM) Alloy Energy Harvester**
A.J. NISKANEN, Adaptamat Oy, Helsinki, Finland; I. LAITINEN, Prizztech Oy, Pori, Finland

18.00 *B-3:L18* **Influence of Stress on the Work Performance and Plastic Strain Accumulation during Thermal Cycling of TiNi Alloy Under the Stress - symmetrical Scheme**
S. BELYAEV, **N. RESNINA**, R. ZHURAVLEV, Saint-Petersburg State University, Saint-Petersburg, Russia

18.20 *B-3:L19* **Phase Field Dynamic Modelling of Shape Memory Alloy Nanowires**
R. MELNIK[1, 2, 3], R. DHOTE[1, 4], J. ZU[2], L.X. WANG[5], [1]M2NeT Laboratory, Wilfrid Laurier University, Waterloo, ON, Canada; [2]Basque Excellence Research Centre BCAM, Bilbao, Spain; [3]Ikerbasque, Basque Foundation for Science, Bilbao, Spain; [4]Dept. of Mechanical and Industrial Engineering, University of Toronto, ON, Canada; [5]FPTC State Key Laboratory, Zhejiang University, P.R. China

Session B-2 - Phase Transformation and Microstructure

Room: **TURCHESE**

Chair: Peter MÜLLNER, USA

15.00 *B-2:L19* **Small-scale Transformation Behavior of Pseudoelastic NiTi under Uni- and Multi-axial Loading**
I. SEN, Chemnitz University of Technology, Institute of Materials Science and Engineering, Chemnitz, Germany; R. RAGHAVAN, J. MICHLER, EMPA Materials Science and Technology, Thun, Switzerland; M.F.-X. WAGNER, Chemnitz University of Technology, Institute of Materials Science and Engineering, Chemnitz, Germany

15.20 *B-2:L20* **Athermal and Isothermal Transformations in Ni-Ti and Ni-Ti-X (X=Fe, Cu) Alloys**
S. KUSTOV, E. CESARI, **D. SALAS**, Dept. de Física, Universitat de les Illes Balears, Palma de Mallorca, Spain; J. VAN HUMBEECK, Dep. MTM, KU Leuven, Leuven, Belgium

15.40 *B-2:L21* **The Effect of Pressure on Martensitic Phase Transformations**
V. PAIDAR, A. OSTAPOVETS, Institute of Physics AS CR, Prague, Czech Republic; O. HARDOUIN DUPARC, LSI, Ecole Polytechnique, Palaiseau, France

16.00 *B-2:L22* **Superelasticity in Cu-Al-Mn and Ni-Ti Shape Memory Alloys at Cryogenic Temperature**
K. NIITSU, T. OMORI, R. KAINUMA, Dept. of Materials Science, Graduate School of Engineering, Tohoku University, Sendai, Japan

16.20 *B-2:L23* **Deformation Twinning in Ni2MnGa**
R.C. POND, University of Exeter, Exeter, UK; B. MUNTIFERING, P. MULLNER, Boise State University, Boise, ID, USA

16.40 *B-2:L24* **Magnetic Phase Diagram of NiCoMnGa Metamagnetic Shape Memory Alloy**
X. XU, R. KAINUMA, Dept. of Materials Science, Graduate School of Eng., Tohoku University, Sendai, Japan; W. ITO, Institute for Materials Research, Tohoku University, Natori, Japan; R.Y. UMETSU, Institute for Materials Research, Tohoku University, Sendai, Japan

Room: **ALBA 2**

Session C-2 - Analysis and Physical Mechanisms

Chair: Jinsong LENG, China

15.00 *C-2:IL10* **Conducting IPN Actuators, from Actuation Mechanism to Applications**
C. PLESSE[1], N. FESTIN[1, 2], A. KHALDI[3], P. PIRIM[2], E. CATTAN[3], C. CHEVROT[1], D. TEYSSIE[1], **F. VIDAL**[1], [1]Laboratoire de Physicochimie des Polymeres et des Interfaces, Université de Cergy-Pontoise, Cergy-Pontoise, France; [2]Brain Vision Systems (BVS), France; [3]IEMN CNRS UMR-8520, NAM6 group, Villeneuve d'Ascq, France

15.30 *C-2:IL11* **Survival Test Experiments for Ionic EAP-s**
A. PUNNING, I. MUST, K. KRUUSAMÄE, **A. AABLOO**, Intelligent Materials and Systems Lab, Institute of Technology, University of Tartu, Tartu, Estonia

16.00 *C-2:L12* **Electrochemical Control of the Memory Properties of Poly(3,4-ethylenedioxythiophene)**
H. RANDRIAMAHAZAKA, S. CLOTEAU, J. GHILANE, J-C. LACROIX, University Paris Diderot, Sorbonne Paris Cité, UMR 7086 CNRS, Paris, France

16.20 *C-2:L13* **Theoretical Modeling and Numerical Simulation of IPMC Multiphysics**
S. GALANTE, A. LUCANTONIO, **P. NARDINOCCHI**, University of Rome "La Sapienza", Italy

16.40 *Break*

Session C-4 - Applications

Chair: Steen SKAARUP, Denmark

17.10 *C-4:IL01* **New Materials Advances for Smart Electro-active Polymers**
H.E. NAGUIB, University of Toronto, Toronto, Ontario, CANADA

17.40 *C-4:IL02* **Organic Robotics Based on Conducting Polymers**
H. OKUZAKI, University of Yamanashi, Kofu, Japan

Room: **GIOVE**

Session F-7-Adaptive Optics for Biological Applications

Chair: Austin ROORDA, USA

15.00 *F-7:IL05* **Measuring and Correcting Aberrations in the Rat Brain**
J. WANG[1, 2], J.-F. LEGER[1], J. BINDING[1, 2], C. BOCCARA[2], **S. GIGAN**[2], L. BOURDIEU[1], [1]Ecole Normale Supérieure, Institut de Biologie de l'ENS, IBENS, Paris, France. Inserm, U1024, Paris, France. CNRS, UMR 8197, Paris, France; [2]Institut Langevin, ESPCI ParisTech, CNRS UMR 7587, ESPCI, Paris, France

15.30 *F-7:IL06* **How a Microscope in a Needle can Image Cancer in Humans at High Resolution**
D.A. SAMPSON, R.A. MCLAUGHLIN, R.W. KIRK, B.C. QUIRK, A. CURATOLO, X. YANG, K.M. KENNEDY, B.Y. YEO, D. LORENSER, Optical + Biomedical Engineering Laboratory, School of Electrical, Electronic and Computer Engineering, and Centre for Microscopy, Characterisation and Analysis, University of Western Australia, Perth, Western Australia, Australia

16.00 *Break*

Session F-5 - Advances in Diagnostic Techniques

Chair: Giancarlo RIGHINI, Italy

16.30 *F-5:IL01* **Neutron Scattering in Optical Materials**
C. PETRILLO, Dipartimento di Fisica, Unviersità di Perugia, Perugia, Italy

17.00 *F-5:IL02* **Versatile Smart Optical Materials Characterizer**
YEONJOON PARK, HYUNJUNG KIM, National Institute of Aerospace, Hampton, VA, USA; GLEN KING, SANG CHOI, NASA Langley Research Center, USA

17.30 *F-5:IL03* **Ultrasensitive SERS Analysis**
R. ALVAREZ-PUEBLA, Departamento de Química Física and Unidad Asociada CSIC, Universidade de Vigo, Vigo, Spain

Special Session G-6 - Advances and Challenges in the SHM of Civil and Aerospace Structures

Room: **LE PLEIADI**

Chair: Piervincenzo RIZZO, USA

15.00 *G-6:IL06* **Laser Ultrasonic Techniques for Structural Health Monitoring Applications**
HOON SOHN, YUN KYU AN, BYEONGJIN PARK, TROUNG THANH CHUNG, CHUL MIN YEUM, JIN YEOL YANG, HYEON SEOK LEE, KAIST, Yuseong-gu, Republic of Korea

15.30 *G-6:IL07* **Sensor Location in Nonlinear Acoustics Used for Damage Detection in Composite Chiral Sandwich Panels**
A. KLEPKA[1], **W.J. STASZEWSKI**[1], D. DI MAIO[2], F. SCARPA[2], K.F. TEE[3], T. UHL[1], [1]Department of Robotics and Mechatronics, AGH University of Science and Technology, Krakow, Poland; [2]Department of Aerospace Engineering, Bristol University, UK; [3]School of Engineering, Greenwich University, UK

16.20 *G-6:L09* **Vibration Control of Chimney Using Tuned Mass Damper**
S.N. TANDE, B.N. NAIK, Walchand College of Engineering, Sangli, India

16.40 *Break*

17.00 *G-6:L10* **On Line Material Parameters Assessment for SHM Application**
T. UHL, P. PACKO, L. AMBROZINSKI, W. STASZEWSKI, AGH University of Science and Technology, Krakow, Poland

17.40 *G-6:L12* **A Comparative Assessment of Two SHM Damage Detection Methods in a Laboratory Tower**
E. ZUGASTI[1], A. GÓMEZ GONZÁLEZ[2], J. ANDUAGA[1], M.A. ARREGUI[1], F. MARTÍNEZ[1], [1]Ikerlan IK4, Arrasate, Spain; [2]Universidade de Santiago de Compostela, Spain

18.00 *G-6:L13* **Characterization of CFRP Composites Using Electro-mechanical Impedance Technique**
T. WANDOWSKI, P. MALINOWSKI, L. SKARBEK, S. OPOKA, W. OSTACHOWICZ, Institute of Fluid-Flow Machinery, Polish Academy of Sciences, Gdansk, Poland; W. OSTACHOWICZ, Gdynia Maritime University, Faculty of Navigation, Gdynia, Poland

18.20 *G-6:L11* **Experimental Dynamic System Identification of Damaged Reinforced Beam**
V. VOLKOVA, Dnepropetrovsk National University of the Railway Transport, Dnepropetrovsk, Ukraine

Session H-6 - Ongoing and Perspective Applications of Bio-inspired Technologies

Room: **SMERALDO 2**

Chair: Friedrich SIMMEL, Germany

15.00 *H-6:IL01* **Bioinspired Surfaces for Friction Control**
B. MURARASH, Y. ITOVICH, **M. VARENBERG**, Dept. of Mechanical Engineering, Technion - IIT, Haifa, Israel

15.30 *H-6:IL02* **DNA Origami as a Calibration Standard for Superresolution Microscopy**
P. TINNEFELD, Institut für Physikalische und Theoretische Chemie, Braunschweig University of Technology, Braunschweig, Germany

16.00 *H-6:IL03* **An Antifouling Coating Having Low Surface Energy and a Bio-inspired Microstructure**
BIRU HU, YUNQIU LI, NAN TIE, CHAO LIANG, WENJIAN WU, Department of Chemistry and Biology, College of Science, National University of Defense Technology, Changsha, Hunan Province, P.R.China

16.30 *H-6:L04* **Light Transmission in the Window Plant Fenestraria aurantiaca as Inspiration for Innovative Biomimetic Solutions**
I. SCHÄFER, Carinthia University of Applied Sciences (AT), Radolfzell, Germany

Session J-6 - Biomedical Applications of Shape Memory Materials and Smart Textiles

Room: **SMERALDO 3**

Chair: E.Pasquale SCILINGO, Italy

15.00 *J-6:IL01* **Progress in Interactive Textiles for Health Monitoring**
J. LUPRANO, CSEM SA, Neuchâtel, Switzerland

15.30 *J-6:IL02* **Shape Memory Polyurethanes for Minimally Invasive Surgical Procedures**
M.C. TANZI, S. FARÈ, S. BERTOLDI, Bioengineeering Dept; L. DE NARDO, A. CIGADA, Chimica, Materiali e Ingegneria Chimica "G. Natta" Dept., Politecnico di Milano, Italy

16.00 *J-6:L03* **Application of a Shape-memory Polymer in a Soft-tissue Fixation Device for Anterior Cruciate Ligament Reconstruction**
K.E. SMITH, J. GRIFFIS, K. GALL, MedShape Solutions, Atlanta, GA, USA

16.20 *J-6:L04* **Understanding in-vivo Abrasion Fatigue of Common Suture Materials Used in Arthroscopic and Open Shoulder Surgery**
C.J. HURREN[1], A. SUTTI[1], E. SAVAGE[3], S. SLADER[3], R.S. PAGE[2,3], [1]Centre for Material and Fibre Innovation, Deakin University, Geelong, Australia; [2]Barwon Orthopaedic Research Unit, Geelong Australia; [3]School of Medicine, Deakin University, Geelong, Australia

POSTER DISCUSSION

THURSDAY JUNE 14: 18.30 - 19.45

Posters desmounting:
(after the Poster Discussion Session)

SYMPOSIUM A

ADAPTIVE, ACTIVE AND MULTIFUNCTIONAL SMART MATERIALS SYSTEMS

A-1:P02 **Silver Oxalate Thermal Decomposition Mechanism**
K. KIRYUKHINA[1, 2, 3, 4], H. LE TRONG[2, 5], P. TAILHADES[2, 3], J. LACAZE[2, 3], V. BACO[2, 3], F. COURTADE[1], O. VENDIER[4], [1]Centre National d'Etudes Spatiales, Toulouse Cedex, France; [2]Universite de Toulouse, UPS, INP, Institut Carnot CIRIMAT, Universite Paul Sabatier, Toulouse Cedex, France; [3]CNRS, Institut Carnot Cirimat, Toulouse, France; [4]Thales Alenia Space, Toulouse Cedex, France; [5]Faculty of Chemistry, University of Natural Sciences, Vietnam National University-HoChiMinh City, HoChiMinh, Vietnam

A-1:P04 **Dielectric Properties of Ba1-xLaxTi1-x/4O3 Ceramics with different La3+ Content**
B. WODECKA-DUS, University of Silesia, Department of Materials Science, Sosnowiec, Poland

A-1:P05 **Electrical Properties of CaCu3Ti4O12 Films Prepared by RF Magnetron Sputtering**
C.R. FOSCHINI, R. TARARAM, A.Z. SIMOES, E. LONGO, J.A. VARELA, Sao Paulo State University, UNESP - Physical-Chemistry Department, Araraquara, Sao Paulo, Brazil

A-1:P08 **The Impact of Titanium Film Properties on the c-axis Orientation of Sputter-deposited AlN Thin Films**
A. ABABNEH[1], H. SEIDEL[2], T. MANZANEQUE[3], J. HERNANDO[3], J.L. SÁNCHEZ-ROJAS[3], A. BITTNER[4], **U. SCHMID**[4], [1]Yarmouk University, Electronic Engineering Department, Hijjawi Faculty for Engineering Technology, Jordan; [2]Saarland University, Faculty of Natural Sciences and Technology II, Chair of Micromechanics, Microfluidic/Microactuators, Saarbrücken, Germany; [3]E.T.S.I. Industriales, Universidad de Castilla La Mancha, Ciudad Real, Spain; [4]Vienna University of Technology, Institute of Sensor and Actuator Systems, Department for Microsystems Technology, Vienna, Austria

A-1:P09 **Multilayer Ceramic Capacitors Based on the PMN-PT-PFN Solid Solution**
P. WAWRZALA, **D. BOCHENEK**, R. SKULSKI, J. KULAWIK, D. SZWAGIERCZAK, University of Silesia, Department of Materials Science, Sosnowiec, Poland

A-1:P09b **Synthesis and Electrical Analysis of Nano-crystalline Barium Titanate and PLZT Nanocomposites**
T.P. CHAVEZ, C.B. DIANTONIO, T. MONSON, Sandia National Laboratories, Albuquerque, NM, USA

A-1:P10 **A Study on the Correlation Between Carrier and Ferromagnetism Based on Hydrogen Mediation**
JI-HUN PARK, SEUNGHUN LEE, WON-KYUNG KIM, YONG CHAN CHO, H. KOINUMA, SE-YOUNG JEONG, Department of Cogno-mechatronics Engineering, Pusan National University, Miryang-si, Korea

A-1:P12 **Influence of the Medium Composition on Aggregation of Titania Nanocrystals**
O. PAVLOVA-VEREVKINA, Karpov Institute of Physical Chemistry, Moscow, Russia

A-2:P14 **Polyvinyl Butyral from Laminated-glass Waste for Encapsulating Photonic Molecular Nanodevices**
D.R. SlQUEIRA, **P. SANTA-CRUZ**, Federal University of Pernambuco - UFPE, DQF, Recife, PE, Brazil

A-2:P15 **Calix[4]arenes Appended with Thioamide and Hydroxamic Acid Moieties: Powerful Tools for Heavy Metals Recognition**
J. KULESZA, S. ALVES JÚNIOR, Depto de Química Fundamental, Universidade Federal de Pernambuco; M. GUZIÑSKI, M. BOCHEÑSKA, Dept. of Chemical Technology, Chemical Faculty, Gdansk University of Technology, Gdansk, Poland; V. HUBSCHER-BRUDER, F. ARNAUD-NEU, Laboratoire de Chimie-Physique, IPHC-DSA, UDS, CNRS, ECPM, Strasbourg Cedex, France

A-5:P19 **Tristriazaolotriazines with pi-conjugated Segments: Solvatochromic Fluorophors and Discotic Liquid Crystals**
S. GLANG, D. BORCHMANN, T. RIETH, **H. DETERT**, Institute for Organic Chemistry, Johannes Gutenberg-University, Mainz, Germany

A-5:P21 **Light-induced Phase Collapse in a Rubidium Manganese Hexacyanoferrate**
H. TOKORO[1, 2], SHIN-ICHI OHKOSHI[1, 3], [1]Department of Chemistry, School of Science, The University of Tokyo, Tokyo, Japan; [2]NEXT, JSPS, Tokyo, Japan; [3]CREST, JST, Tokyo, Japan

A-6:P24 **Production and Characterization of Ti-27Nb-13Zr Alloys by Powder Metallurgy**
M.W.D. MENDES, A.H.A. BRESSIANI, J. C. BRESSIANI, Instituto de Pesquisas Energéticas e Nucleares - IPEN/SP, Brazil

A-6:P26 **Influence of Hydrochloric Acid Concentrations on the Formation of AgCl-doped Iron Oxide-Silica Coreshell Structures**
N. MAHMED, S-P. HANNULA, Aalto University School of Chemical Technology, Dept. of Materials Science and Engineering, Aalto, Finland; O. HECZKO, Institute of Physics, Academy of Sciences, Czech Rep., Praha, Czech Republic

A-6:P28 **Multifunctional Carbon-magnetite Nanocomposite Using Polyaniline as a Precursor**
A.C. VAZ DE ARAUJO, E.H.L. FALCAO, S. ALVES JR., W.M. DE AZEVEDO, Universidade Federal Rural de Pernambuco - UAG, Garanhuns, PE, Brazil Universidade Federal de Pernambuco, Recife, PE, Brazil

A-6:P29 **The Oxidation Mechanism of Si1-xGex Nanowires**
JUNGMIN BAE[1], WOO-JUNG LEE[1], JIN WON MA[1], MANN-HO CHO[1], JAE PYUNG AHN[2], HYUNGSUB KIM[3], [1]Dept. of Physics and Applied Physics, Yonsei University, Seoul, Korea; [2]Nano Materials Analysis Center, Korea Institute of Science and Technology, Seoul, Korea; [3]School of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon, Korea

A-6:P31 **Characterization of Novel Materials, Biogenous Iron Oxide, Produced by Iron-Oxidizing Bacteria**
H. HASHIMOTO[1], H. ASAOKA[1], Y. KUSANO[2], H. KUNOH[1], Y. IKEDA[3], M. SENO[1], M. NAKANISHI[1], T. FUJII[1], M. TAKANO[4], J. TAKADA[1], [1]Graduate

School of Natural Science and Technology, Okayama University, Okayama, Japan; [2]Department of Applied Arts and Design, Kurashiki University of Science and the Arts, Kurashiki, Okayama, Japan; [3]Institute of Chemical Research, Kyoto University, Uji, Kyoto, Japan; [4]Institute for Integrated Cell-Material Sciences, Kyoto University, Yoshida-Ushinomiyacho, Kyoto, Japan

A-6:P32 **Incorporation of Carbon into Silicon Nanowires Grown with Au Catalyst**
WOO-JUNG LEE[1], JIN WON MA[1], JUNG MIN BAE[1], SAN HAN PARK[1], MANN-HO CHO[1], BONGYOUNG YOO[2], JAE PYUNG AHN[2], [1]Department of Physics and Applied Physics, Yonsei University, Seoul, Korea; [2]Nano Materials Analysis Center, Korea Institute of Science and Technology, Seoul, Korea

A-6:P34 **Surface Modification of High Internal Phase Emulsion Foam as a Scaffold for Tissue Engineering Application via Atmospheric Pressure Plasma Treatment**
P. PAKEYANGKOON, Department of Mechanical Engineering Technology, College of Industrial Technology, King Mongkut's University of Technology North Bangkok, Bangkok, Thailand; R. MAGARAPHAN, P.H. MALAKUL, **M. NITHITANAKUL**, Center for Petroleum, Petrochemical, and Advanced Materials, Bangkok, Thailand and The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

A-6:P35 **Development of Porous Carbon Derived from Polybenzoxazine and its Application as an Electrode for Supercapacitors**
T. CHAISUWAN, N. MAHINGSUPAN, S. WONGKASEMJIT, The Petroleum and Petrochemical College and the National Center of Excellence for Petroleum, Petrochemicals, and Advanced Materials, Chulalongkorn University, Bangkok, Thailand

A-6:P36 **Lectinhistochemistry Evaluation of Bone after Implantation with Macroporous Titanium Samples**
K.B. VIOLIN, T.S. GOIA, J.C. BRESSIANI, A.H.A. BRESSIANI, Instituto de Pesquisas Energeticas e Nucleares, Sao Paulo, SP, Brasil

A-7:P38 **Synthesis, Characterization and Spectroscopic Properties of Calix[4]arenes Derivatives of Lanthanides ions under Solvothermal and Hydrothermal Conditions**
C.A. FERNANDES OLIVEIRA, J. KULESZA, S.A. JÚNIOR, DQF, Universidade Federal de Pernambuco, Recife, Brazil; **B.S. BARROS**, ECT, Universidade Federal do Rio Grande do Norte, Natal, Brazil; M. BOCHENSKA, DCT, Gdansk University of Technology, Poland

A-7:P39 **Understanding the Doxorubicin Interaction with Zeolite Imidazolate Frameworks (ZIF-8): A Theoretical and Experimental Investigation**
I.B. VASCONCELOS[1], T.A. SOARES[1], R.O. FREIRE[2], N.B.C. JÚNIOR[2], G.F. DE SÁ[1], **S. ALVES JÚNIOR**[1], [1]Universidade Federal de Pernambuco, Recife, PE, Brazil; [2]Universidade Federal de Sergipe, Recife, PE, Brazil

A-7:P39b **Zeolitic Imidazolate Framework (ZIF-8) for Anticancer Drug Delivery: Fluorescence Study**
I. BEZERRA VASCONCELOS, T.G. DA SILVA, R.C.B.Q. FIGUEIREDO, G. F. DE SÁ, S.A. JÚNIOR, Universidade Federal de Pernambuco, Recife, PE, Brazil

A-8:P40 **Infrared Thermochromic Properties of VO2 Thin Films Prepared through Aqueous Sol-gel Process**
D.Q. LIU, H.F. CHENG, W.W. ZHENG, C.Y. ZHANG, Key Laboratory of Advanced Ceramic Fiber and Composites, College of Aerospace and Materials Engineering, National University of Defense Technology, Changsha, China

A-8:P42 **Development of Superhydrophobic Surface Morphology**
N. KUNDURACI, Anadolu University, Eskisehir, Turkey

A-8:P45 **Study on the Fabrication of Visible Light Response Type N-doped TiO2 Photocatalyst by SPS**
N. KIKUCHI, T. ASAOKA, Tokyo Denki University, Ishizaka, Saitama, Japan

A-10:P46 **Memory Effect of a Different Materials as Charge Storage Elements for Memory Applications**
I. SALAORU, S. PAUL, Emerging Technologies Research Centre, De Montfort University, Leicester, UK

A-10:P47 **Multilevel Resistance Switching in TaOx-based RRAM Device**
YING-CHIUAN CHEN, YU-LUNG CHUNG, BO-TAO CHEN, **JEN-SUE CHEN**, Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan

A-10:P48 **Charge Retention in Low Temperature Poly-Si Rewritable Memory on Glass**
T.A. MIH, S. PAUL, Emerging Technologies Research Centre, De Montfort University, Leicester, UK

A-10:P49 **Modulation of Biopolar Resistive Switching for Fuel-assisted NiOx Film via Tailoring of its Interface with Al Electrode**
KUN-KENG CHIANG[1], JEN-SUE CHEN[2], **JIH-JEN WU**[1], [1]Department of Chemical Engineering, National Cheng Kung University, Tainan, Taiwan; [2]Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan

A-11:P52 **Multi-component Oxide Thin Films and Heterostructures for Electronics: Growth Principles**
K. ENDO, Kanazawa Institute of Technology, Hakusan, Japan; P. BADICA, National Institute of Materials Physics, Bucharest-Magurele, Romania

A-11:P54 **Ferroic and Structural Study of High-dense Polycrystalline TbMnO3 Ceramics**
G.S. DIAS, R.A.M. GOTARDO, I.A. SANTOS, L.F. CÓTICA, Universidade Estadual de Maringá - Paraná - Brazil; L. ZABOTTO, D. GARCIA, J.A. EIRAS, Universidade Federal de Sao Carlos - Sao Paulo - Brazil

A-11:P55 **Magnetostrictive and Magnetoelectric Properties in Nickel Ferrite - Niobate Relaxor Structures**
P. GUZDEK, Institute of Electron Technology, Cracow Division, Cracow, Poland

A-11:P56 **Magnetic Properties of the Bi9Fe5Ti3O27 Aurivillius Phase Doped with Samarium**
M.M. BUCKO, C. KAPUSTA, J. POLNAR, J. LIS, AGH - University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland

A-11:P57 **Reflection of Electromagnetic Waves from Multiferroic TbMnO3**
I.V. BYCHKOV, L.N. BUT'KO, S.Y. LAMEKHOV, V.V. SHADRIN, Chelyabinsk State University, Chelyabinsk, Russia

A-11:P59 **Structural Relationship in BiFeO3 - Based Compounds**
L.F. COTICA[1], I.B. CATELLANI[1], G.S. DIAS[1], F. YOKAICHIYA[2], I.A. SANTOS[1], [1]Depto de Física, Universidade Estadual de Maringá, Maringá - Paraná, Brazil; [2]Laboratório Nacional de Luz Síncrotron, Campinas - São Paulo, Brazil

A-12:P63 **Method of CRLH Antenna Impedance Measurement by Means of On-wafer Characterization Equipment**
G.I. SAJIN, National Research Institute for Microtechnologies, IMT Bucharest, Microwave Laboratory, Bucharest, Romania; I.A. MOCANU, Politechnica University of Bucharest, Faculty of Electronics, Telecommunications and Informations Engineering, Bucharest, Romania

A-13:P65 **Breakdown of the Quantum Hall Effect in Graphene**
Y. MORITA, Gunma University, Kiryu, Japan

A-13:P67 **Graphene Based Cathode for Dye Sensitized Solar Cells**
L. KAVAN, J. Heyrovský Institute of Physical Chemistry, v.v.i., Academy of Sciences of the Czech Republic, Prague, Czech Republic

A-13:P70 **Graphene-chitosan Nanocomposite Film by Reduction of Graphene Oxide within Chitosan Networks**
CHANG KEE LEE, JIN KIE SHIM, **SANG BONG LEE**, Korea Packaging Center, Korea Institute of Industrial Technology, Bucheon, Korea

A-14:P72 **Structural and Photovoltaic Properties of CuO/ZnO Nanocomposite Solar Cells**
R. SHARMA, **JIN-HWAN KIM**, YOON-BONG HAHN, School of

Semiconductor and Chemical Engineering, WCU Department of BIN Fusion Technology, Chonbuk National University, South Korea

A-14:P74 **ITO-free Low-cost Organic Solar Cells with Highly Conductive Poly(3,4 ethylenedioxythiophene): p-toluene Sulfonate Anodes**
KIYEUL YANG, M. ARIFUR RAHMAN, A. RAHIM, MD. MANIRUZZAMAN, C. LEE, H. NAM, H. SOH, J. LEE, Kookmin University, Seoul, South Korea

A-14:P76 **The Influence of Anatase Crystal Orientation on its Electrochemical Properties and Performance in Dye-sensitized Solar Cell**
M. ZUKALOVA[1], B. LASKOVA[1, 2], L. KAVAN[1, 2], A. CHOU[3], P. LISKA[4], ZHANG WEI[5], LIU BIN[5], M. GRÄTZEL[4], [1]J. Heyrovský Inst. of Physical Chemistry, v.v.i., Academy of Sciences of the Czech Rep., Prague, Czech Rep.; [2]Dept. of Inorganic Chemistry, Faculty of Science, Charles University, Hlavova, Prague, Czech Rep.; [3]LIARC Centre of Excellence for Functional Nanomaterials, The University of Queensland, St Lucia, Queensland, Australia; [4]Lab. of Photonics and Interfaces, Inst. of Chemical Sciences and Engineering, Swiss Federal Institute of Technology, Lausanne, Switzerland; [5]Dept. of Chemical and Biomolecular Engineering, National University of Singapore, Singapore

A-15:P80 **Epoxy Based Shape Memory Polymer Composites with Different Textile Reinforcements**
M. FEJOS, J. KARGER-KOCSIS, Department of Polymer Engineering, Faculty of Mechanical Engineering, Budapest University of Technology and Economics, Budapest, Hungary

A-15:P83 **Tailored One-way and Two-way Shape Memory Response of Poly(e-caprolactone)-based Systems for Biomedical Applications**
S. PANDINI[1], S. PASSERA[1], T. RICCO[1], A. BORBONI[1], I. BODINI[1], D. VETTURI[1], L. DASSA[1], D. CAMBIAGHI[1], K. PADERNI[2], M. DEGLI ESPOSTI[2], M. MESSORI[2], M. TOSELLI[2], F. PILATI[2], [1]Dipartimento di Ingegneria Meccanica e Industriale, Università degli Studi di Brescia, Italy; [2]Dipartimento di Ingegneria dei Materiali e dell'Ambiente, Università degli Studi di Modena, Reggio Emilia, Italy

A:HP88 **Microencapsulated Systems for Self-healing Coatings and Adhesives**
B. DI CREDICO, M. LEVI, S. TURRI, Department of Chemistry, Materials and Chemical Engineering "Giulio Natta", Politecnico di Milano, Milan, Italy

A:HP89 **Poly(Para-Phenylene Vinylene)/Zeolite Y Composites and Electrical Conductivity Response towards Ketone Vapors**
J. KAMONSAWAS, A. SIRIVAT, P. HORMNIRUN, W. PRISSANAROON-OUIJAI, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

A:HP90 **Fabrication of Polydiphenylamine and Zeolite Y Composites as a Sensing Material**
T. PERMPOOL[1], D. ASSAWASATIEN[2], L. WANNATHONG[3], A. SIRIVAT[1], [1]The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand; [2]National Metal and Materials Technology center, National Science and Technology Development Agency, Ministry of Science and Technology, Bangkok,Thailand; [3]Faculty of Engineering, King Mongkut's University of Technology North Bangkok, Thailand

A:HP91 **Modeling of Shape-memory Recovery in Crosslinked Semicrystalline Polymers**
I. KOLESOV, **O. DOLYNCHUK**, H.-J. RADUSCH, Martin Luther University Halle-Wittenberg, Halle (Saale), Germany

A:HP92 **Ceramics PMN-PT-PFN for Multilayered Capacitors**
D. BOCHENEK, **R. SKULSKI**, P. WAWRZALA, P. NIEMIEC, University of Silesia, Department of Materials Science, Sosnowiec, Poland

A:HP93 **Nitridation of Thick Si Compacts to Produce SiAlON Ceramics**
A. CETINKAYA, F. KARA, Anadolu University, Material and Science Engineering, Eskisehir, Turkey

A:HP94 **Foreign Bodies - The Creation of Symbiotic Jewellery through the Development and Application of Stimulus-responsive Smart Materials and Microelectromechanical Systems**
K. VONES, S. WILSON, The University of Dundee, Duncan of Jordanstone College of Art and Design, Edinburgh, UK

A:HP95 **Design of Hierarchically Structured Macro-mesoporous Alumina via the Sol-gel Process**
A. RIBEIRO PASSOS, L. MARTINS, S.H. PULCINELLI, C.V. SANTILLI, Universidade Estadual Paulista, Dept. of Physical Chemistry, Araraquara, SP, Brazil

A:HP96 **Control of Hierarchical Porosity and Acidity of Alumina Supports Designed for Catalytic Conversion of Ethanol**
W.H. CASSINELLI, L. MARTINS, S.H. PULCINELLI, C.V. SANTILLI, Universidade Estadual Paulista, Dept. of Physical Chemistry, Araraquara, SP, Brazil

A:HP97 **Interface Engineering of P3HT/TiO2 Heterjunction in Hybrid Solar Cells**
JUFONG YU,TSUNG-LUNG SHEN, WEI-HSIANG WENG, YU-CHEN HUANG, CHING-I HUANG, **LEEYIH WANG**, National Taiwan University, Center for Condensed Matter Sciences, Taipei, Taiwan

A:HP98 **Superhard TiB2-based Composites with Different Matrix Fabricated from Elemental Powders by SHS-p-HIP**
M. ZIEMNICKA-SYLWESTER, M. OHNO, Faculty of Engineering, Hokkaido University, Sapporo, Japan

A:HP99 **Graphene-based Nanocomposites for Supercapacitor Applications**
HEE-CHANG YOUN, HO RIM KANG, KWANG HEON KIM, **KWANG-BUM KIM**, Yonsei University, Department of Material Science and Engineering, Seoul, Korea

A:HP100 **Nb and Y Doping in BaTiO3: Compensation Mechanisms and Ferroelectric Properties**
M. PAREDES-OLGUIN[1], F.R. BARRIENTOS-HERNÁNDEZ[1,2], I. LIRA-HERNÁNDEZ[1], A. ARENAS-FLORES[2], **C. GÓMEZ-YÁÑEZ**[1], [1]Department of Metallurgical and Materials Engineering, National Polytechnic Institute, Mexico city, Mexico; [2]Academic Area of Earth Science and Materials, Autonomous University of Hidalgo State, Mexico

A:HP101 **Structural Design Optimization of Multiferroic Composites for Maximized Energy Conversion**
KYUNG HO SUN, Korea Institute of Machinery & Materials, Daejeon, Korea; JAE EUN KIM, Catholic University of Daegu, Korea; YOON YOUNG KIM, Seoul National University, Korea

A:HP102 **Preparation and Properties of Thermal Camouflage Materials from PET Fiber Having ATO**
S.D. KIM[1], Y.D. KIM[2], H.J. LEE[3], [1]Department of Textile Engineering, Konkuk University, Seoul, Korea; [2]PAKA RGB, Sungkok-dong Ansan Kyeonggi-do, Korea; [3]Korea Institute of Industrial Technology, Ansan Kyeonggi-do, Korea

A:HP103 **Electrical Conductivity and Response of PEDOT-PSS/Ion-Exchanged Zeolite Y Composites toward SO2**
P. CHANTHAANONT, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

A:HP104 **Novel Sulfonated Poly(arylene ether ketone sulfone) Proton Exchange Membrane for Using in DMFC**
S. CHANGKHAMCHOM, A. SIRIVAT, Conductive and Electroactive Polymer Research Unit, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

A:HP105 **Linear Direct Magnetoelectric Response in CoFe2O4/PVDF 0-3 Nanocomposites**
P. MARTINS[1], X. MOYA[2], N.D. MATHUR[2], S. LANCEROS-MENDEZ[1], [1]Centro/Departamento de Física, Universidade do Minho, Braga, Portugal; [2]Department of Materials Science, University of Cambridge, Cambridge, UK

A:HP106 **Broadband Vibration Energy Harvester with Variable Proof Mass using Single Crystal Piezoelectric Material**
MOONKEUN KIM, SANG-KYUN LEE, YIL SUK YANG, ETRI, The Convergence Components & Materials Research Laboratory, Daejeon, Korea

A:HP107 **Nitrogen-doped Highly Conductive Carbon Film for Electronics**
RONGJIN LI, K. PARVEZ, X. FENG, K. MÜLLEN, Max-Planck-Institute for Polymer Research, Mainz, Germany

A:HP108 **Field Emission Properties of Ti Nanowires Grown by Chemical Vapor Deposition**
TZE-LUNG CHEN, H.-T. CHIU, Department of Applied Chemistry, National Chiao Tung University, Hsinchu, Taiwan, R.O.C.

A:HP109 **Study of the Interaction and Assembly of 1-pyrenesulfonic Acid Sodium Salt on Graphene in Aqueous Solutions**
HUAFENG YANG[1], **SUKHRAAJ JOHAL**[1], Y. HERNANDEZ[2], A. FELTEN[3], A. ECKMANN, P. LOUETTE[4], J.-J. PIREAUX[4], XINLIANG FENG[2], K. MULLEN[2], C. CASIRAGHI[1, 3], [1]School of Chemistry and Photon Science Institute, Manchester University, UK; [2]Max Planck Institute for Polymer Research, Germany; [3]Department of Physics, Freie Universität Berlin, Germany; [4]Research Center for the Physics of Matter and Radiation, University of Namur (FUNDP), Namur, Belgium

A:HP110 **Optimization of a Pyrolysis Procedure for Obtaining CMC by PIP for Thermostructural Applications**
C. MINGAZZINI, A. BRENTARI, E. BURRESI, F. BURGIO, M. SCAFÈ, ENEA-UTTMATF, Faenza, Italy; L. PILLONI, ENEA - Chemical and Technology Unit - Casaccia Research Centre, Rome, Italy; D. CARETTI, University of Bologna, Dip. di Chimica Industriale e dei Materiali, Bologna, Italy; D. NANNI, University of Bologna, Dip. di Chimica Organica "A. Mangini" Bologna, Italy

A:HP111 **Chemical Production and Microelectronic Applications of Graphene and Nano-graphene Derivatives**
E. TREOSSI[1, 2], A. LISCIO[2], M. MELUCCI[3], G.P. VERONESE[4], J.M. MATIVETSKY[5], R. RIZZOLI[4], P. SAMORÌ[5], V. PALERMO[2], [1]Laboratorio MIST.E-R, Bologna, Italy; [2]ISOF- CNR Bologna, Italy; [3]ICCOM-CNR Sesto Fiorentino, Italy; [4]IMM-CNR Bologna, Italy; [5]ISIS CNRS, Strasbourg, France

A:HP112 **The Interaction of Pyrene Derivatives with Graphene Nanoplatelets**
A. SCHLIERF, E. TREOSSI, HUAFENG YANG, C. CASIRAGHI, V. PALERMO, ISOF- CNR Bologna, Italy

SYMPOSIUM B

STATE-OF-THE-ART RESEARCH AND APPLICATION OF SMAs TECHNOLOGIES

B:P01 **Mechanical, Thermodynamical and Magnetic Properties of Magnetocaloric and Shape Memory Materials Treated by Intensive Plastic Deformation by Cold Rolling**
S.V. TASKAEV[1], V.D. BUCHELNIKOV[1], V.V. SOKOLOVSKY[1], R.R. FAIZULLIN[1], M.O. DROBOSYUK[1], A. PELLENEN[2], V.B. FEDOROV[2], V.V. DYACHUK[2], D.A. ZHERBTSOV[2], V.V. KOLEDOV[3], V.G. SHAVROV[3], I.S. TERESHINA[4], [1]Chelyabinsk State University, Chelyabinsk, Russia; [2]South-Ural State University, Chelyabinsk, Russia; [3]IRE RAS, Moscow, Russia; [4]IMM RAS, Moscow, Russia

B:P02 **Shock Compression of NiTi Powders by One-Stage Gasdynamic Gun**
C. ZANOTTI, P. GIULIANI, G. DAMINELLI, Istituto per l'Energetica e le Interfasi, Milano, Italy; A. TUISSI, P. BASSANI, Istituto per l'Energetica e le Interfasi, Lecco, Italy

B:P05 **Heat-treatment Processing for MnBi in High Magnetic Fields**
K. WATANABE[1], Y. MITSUI[1], K. KOYAMA[2], [1]Institute for Materials Research, Tohoku University, Sendai, Japan; [2]Graduate School of Science and Engineering, Kagoshima University, Kagoshima, Japan

B:P06 **Influence of Atomic Order on the Structural and Magnetic Transitions in Ni-Mn-In Metamagnetic Shape Memory Alloys**
V. RECARTE[1], **J.I. PÉREZ-LANDAZÁBAL**[1], V. SÁNCHEZ-ALARCOS[1], J.A. RODRÍGUEZ-VELAMAZÁN[2, 3], [1]Departamento de Física, Universidad Pública de Navarra, Campus de Arrosadía, Pamplona, Spain; [2]Instituto de Ciencia de Materiales de Aragón, CSIC - Universidad de Zaragoza, Zaragoza, Spain; [3]Institut Laue-Langevin, CRG's D1B D15, Grenoble, France

B:P07 **Composition Dependence of Compatibility in Self-accommodation Microstructure of Beta-titanium Shape Memory Alloy**
T. TERAMOTO, Y. ONO, Department of Innovative and Engineered Materials, Tokyo Institute of Technology, Yokohama, Japan; M. TAHARA, T. INAMURA, H. HOSODA, Precision and Intelligence Laboratory, Tokyo Institute of Technology, Yokohama, Japan; S. MIYAZAKI, Division of Materials Science, University of Tsukuba, Tsukuba, Ibaraki, Japan

B:P12 **Effect of Repeated Heat-treatment under Constrained Strain on Mechanical Properties of Ti-Ni Shape Memory Alloy**
HIROKI CHO[1], T. YAMAMOTO[1], A. SUZUKI[1], K. YAMAUCHI[2], T. SAKUMA[1], [1]Oita-University, Japan; [2]Tohoku-University, Japan

B:P13 **Synthesis of Crystallized TiNi Thin Films by Ion Irradiation**
N. IKENAGA, Research Laboratory for Integrated Systems, Kanazawa Institute of Technology, Ishikawa, Japan; Y. KISHI, Z. YAJIMA, N. SAKUDO, Advanced Materials Science Research and Development Center, Kanazawa Institute of Technology, Ishikawa, Japan

B:P15 **Digital Image-based Method for Quality Control of Residual Bending Deformation in Slender Pseudoelastic NiTi Devices**
S. VISCUSO, S. PITTACCIO, National Research Council of Italy, Institute for Energetics and Interphases, Lecco, Italy

B:HP16 **Martensitic Transformation in Ti-Ni-Sn Alloy Ribbons**
TAE-HYUN NAM, Gyeongsang National University, Korea; YEON-WOOK KIM, Keimyung University, Korea

B:HP17 **Fabrication of Work Operation Assistance Tool Applying Ti-Ni Superelastic Alloy**
K. KITAMURA, S. AKABANE, H. TSUBOI, Aichi University of Education, Kariya, Japan

B:HP18 **Shape Memory Characteristics of Porous 50Ti-30Ni-20Cu Alloy**
YEON-WOOK KIM, Department of Advanced Materials Engineering, Keimyung University, Daegu, Korea

B:HP19 **The Effect of Al Substitution on Microstructure and Martensitic Transition of Ni48Mn39.5Sn12.5-xAlx Heusler Alloy Ribbons**
P. CZAJA, W. MAZIARZ, J. DUTKIEWICZ, T. CZEPPE, Institute of Materials Science and Metallurgy Polish Academy of Sciences, Krakow, Poland

SYMPOSIUM C

ELECTROACTIVE POLYMERS: ADVANCES IN MATERIALS AND DEVICES

C:P01 **Adhesion Between Poly(dimethylsiloxane) Layers**
LIYUN YU, A.E. DAUGAARD, A. LADEGAARD SKOV, Department of Chemical and Biochemical Engineering, Technical University of Denmark, Lyngby, Denmark

C:P02 **An Organic Polymeric Material for Electronics**
A. MARRANI, M. BASSI, Solvay Specialty Polymers, Bollate, Italy

C:P04 **Development of Polyaniline Nano-particles and Chloroprene Rubbers Blends as Electroactive Materials**
R. KUNANURUKSAPONG, **A. SIRIVAT**, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

C:P05 **Electroactive 1-butyl-3-methylimidazolium Chloride Ionic Liquid-microcrystalline Cellulose Gel for Actuator Application**
W. KUNCHORNSUP, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

C:P06 **Crystal Properties Dependence of Dielectric and Piezoelectric Properties of Poly (vinylidene fluoride-co-trifluoroethylene)**
W.M. XIA, **Z. XU**, Z.C. ZHANG, F. WEN, International Center for Dielectric Research, Xi'an Jiaotong University, Xi'an, Shaanxi, China

C:P07 **A Parametric Fractional Model in the Frequency Domain of IPMC Actuators as a Function of Length**
R. CAPONETTO, S. GRAZIANI, **F. PAPPALARDO**, M.G. XIBILIA, DIEEI, University of Catania, Catania, Italy; DiSIA, University of Messina, Messina, Italy

C:P09 **Functional Chararacterisations of Hybrid Nanocomposite Films Based on Polyaniline and Carbon Nanotubes**
M.F. DE RICCARDIS, V. MARTINA, D. CARBONE, P. ROTOLO, UTTMATB ENEA-CR Brindisi, Brindisi, Italy

C:P10 **PVDF Sensors - Research on Foot Pressure Distribution in Dynamic Conditions**
E. KLIMIEC, W. ZARASKA, J. PIEKARSKI, Institute of Electron Technology, Cracow Division, Cracow, Poland

C:HP12 **Nanowire Polypyrrole and Gelatin Hydrogels Blend for Electroactive Application**
T. TUNGKAVET[1], N. SEETAPAN[2], D. PATTAVARAKORN[3], A. SIRIVAT[1]; [1]The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand; [2]National Metal and Materials Technology Center, National Science and Technology Development Agency, Ministry of Science and Technology, Bangkok,Thailand; [3]Faculty of Science, Department of Industrial Chemistry, Chiangmai University, Chiangmai, Thailand

C:P13 **Full Polymer Dielectric Elastomer Actuators (DEA) Functionalized with Carbon Nanotubes and High-k Ceramics**
R. LUTHER, G. PASCHEW, A. RICHTER, Chair of Polymeric Microsystems, Dresden Univ. of Technology, Germany; T. KÖCKRITZ, I. JANSEN, Chair of Laser and Surface Technology, Dresden Univ. of Technology, Germany; E.R. TALENS, O. JOST, Fraunhofer Inst. for Material and Beam Technology, Dresden, Germany; F. SCHLENKRICH, L. SEFFNER, U. KEITEL, A. SCHÖNECKER, Fraunhofer Inst. for Ceramic Technologies and Systems, Dresden, Germany; **M. TIETZE**, Inst.of Semiconductor and Microsystems, Dresden University, Germany

SYMPOSIUM D

SMART AND INTERACTIVE TEXTILES

D:P01 **Development of "Paper Transistor" using Carbon-nanotube-composite Paper**
Y. KAWAMURA, S. HAYASHI, Y. SHINDE, T. OYA, Yokohama National University, Yokohama, Japan

D:P03 **Preparation of Highly Piezoelectric Poly(vinylidene fluoride) Nanofiber Web as a Nanogenerator for Energy Harvesting and Its Power Generating Properties**
YU JIN AHN, S. YOON, D. MANDAL, K.J. KIM, Kyung Hee University, College of Engineering, Yongin-si, Gyeonggi-do, South Korea

D:P04 **Electrically Conductive Polyacrylonitrile Films with High Temperature Performance**
H.J. PARK, **YOUNG HO KIM**, H.T. CHO, Department of Organic Materials and Fiber Engineering, Soongsil University, Seoul, Korea

D:P07 **An Eco-friendly Regenerated Cellulose Fiber Spun from Cotton Linter Pulp in NMMO Monohydrate by Lyocell Process**
MI KYONG YOO, IK MO KIM, YU JIN AHN, SHAMIM-ARA PERVIN, KAP JIN KIM, Kyung Hee University, College and of Engineering, Yongin-si, Gyeonggi-do, South Korea; SANG WOO JIN, JONG CHEO JEONG, WOO CHUL KIM, Industrial Materials Research Institute, Kolon Industrials, Inc, Gumi-si, Gyeongsangbuk-do, South Korea

D:HP08 **MWCNT Reinforced Polymer Fibres for a New Generation of Electric Conductive Textiles**
R.J. RODRIGUEZ, F. MARTIN, G.G. FUENTES, I. DE SCHRIJVER, AIN-tech, Dept. Surface Engineering, Cordovilla (Pamplona), Spain

D:HP09 **Research through Design: A Way to Drive Innovative Solutions in the Field of Smart Textiles**
M. TOETERS, E. BOTTENBERG, G. BRINKS, Saxion University of Applied Sciences, Enschede, The Netherlands; M. TEN BHÖMER, O. TOMICO, Technical University Eindhoven TU/e, The Netherlands

SYMPOSIUM E

NEXT GENERATION MICRO/NANO SYSTEMS

E:P01 **Electrical and Geometrical Analysis of Molybdenum Microcoils as Magnetic Microgenerators**
M. AMATO, S.PETRONI, Center for Biomolecular Nanotechnologies @UNILE, Istituto Italiano di Tecnologia, Arnesano (LE), Italy; G. EPIFANI, National Nanotechnology Laboratory of CNR-INFM, Lecce, Italy; M. De VITTORIO, Center for Biomolecular Nanotechnologies @UNILE, Istituto Italiano di Tecnologia, Arnesano (LE), Italy - National Nanotechnology Laboratory of CNR-INFM, Lecce, Italy - Dip. Ingegneria dell'Innovazione, Università del Salento, Lecce, Italy

E:P04 **Micro Thermoelectric Energy Harvester Using Bi-Te and Sb-Te Thin Films**
SEUNGWOO HAN[1, 2], MIN-SU KIM[2], KWANG EUN LEE[1]; [1]Korea Institute of Machinery & Materials, Department of Nano Mechanics, Daejeon, South Korea; [2]Nano Mechatronics, University of Science and Technology, South Korea

E:P05 **Flexible Thermoelectric Generator with High Thermal Efficiency Kapton/PDMS Package**
L. FRANCIOSO, C. DE PASCALI, P. SICILIANO, CNR-IMM, Institute for Microelectronics and Microsystems, Lecce, Italy

E:P07 **New Viscosity Data for CuO-water Nanofluid - The Hysteresis Phenomenon Revisited**
CONG TAM NGUYEN[1], N. GALANIS[2], E. EVEILLARD[3]*, [1]Faculty of Engineering, Université de Moncton, Moncton (NB), Canada; [2]Faculty of Engineering, Université de Sherbrooke (Québec), Canada; [3]IUT Saint Malo, Université de Rennes 1, France

E:P08 **Wet-etching Characteristic of SiCN Film Deposited by the HWCVD Method**
H. NAKANISHI, T. OGATA, **A. IZUMI**, Kyushu Institute of Technology, Fukuoka, Japan

E:HP09 **Toward Low-cost Micro-reactors with High Temperature Uniformity**
U. KHAN, C. FALCONI, Department of Electronic Engineering, University of Tor Vergata, Roma, Italy

E:HP10 **Quartz Crystal Microbalances for Monitoring the Growth of ZnO Nanowires and Nanosheets**
A. ORSINI, J.P. KAR, F. GATTA, A. D'AMICO, C. FALCONI, Electronic Engineering Department, University of Rome "Tor Vergata", Rome, Italy

E:HP11 **Fabrication of Sub-micron Metal-oxide-metal (MOM) Diodes Using Two Novel Techniques**
L.E. DODD, D. WOOD, A.J. GALLANT, Durham University, School of Engineering and Computing Sciences, Durham, UK

E:HP13 **Comparison of ZnO-based Piezoelectric Nanogenerators on Flexible Substrates**
G. NIARCHOS[1], E. MAKARONA[1], TH. KYRASTA[1], G. VOULAZERIS[1], TH. SPELIOTIS[1], **C. TSAMIS**[1], L. LIN[2], Y. HU[2], Z.L. WANG[2], [1]Institute of Advanced Materials, Physicochemical processes, Nanotechnology & Microsystems, National Center for Scientific Research "Demokritos", Athens, Greece; [2]School of Material Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia, USA

SYMPOSIUM F

SMART & ADAPTIVE OPTICS

F:P02 **Observation of Electric Field Dependence of Molecular Orientation and Anisotropic Magnetic Interactions of All-organic Radical Liquid Crystals by EPR Spectroscopy**
K. SUZUKI, Y. UCHIDA, R. TAMURA, Kyoto University, Kyoto, Japan

F:P03 **PLZT:Nd3+ Ceramics for Photonic Applications**
M. PLONSKA[1], W.A. PISARSKI[2], [1]University of Silesia, Faculty of Computer and Materials Science, Department of Materials Science, Sosnowiec, Poland; [2]University of Silesia, Faculty of Mathematics, Physics and Chemistry, Institute of Chemistry, Katowice, Poland

F:P05 **LED Adjustable Spotlight by Using Photo Controllable PVDF-TrFE Copolymer Deformable Mirror**
S. BONORA, CNR-IFN, Laboratory for Ultraviolet and X-ray Optical Research, Padova, Italy; A. MARRANI, M. BASSI, I. FALCO, Solvay-Solexis R&D Center, Bollate, (MI), Italy; M. MENEGHINI, E. ZANONI, Dipartmento of Information Engineering, University of Padova, Padova, Italy

F:P08 **Peculiarities of Adaptive Laser Location of Debris with Rough Surface**
V.A. BOGACHEV, S.G. GARANIN, N.V. MASLOV, F.A. STARIKOV, V.A. VOLKOV, Russian Federal Nuclear Center - VNIIEF, Institute of Laser Physics Research, Sarov, Russia

SYMPOSIUM G

EMBODING INTELLIGENCE IN STRUCTURES AND INTEGRATED SYSTEMS

G:P01 **Reliability of Stretchable Mould Interconnect in a Conformable Matrix Application**
M. JABLONSKI, J. VANFLETEREN, F. BOSSUYT, T. VERVUST, CMST, Ghent University/IMEC, Ghent, Belgium; M. GONZALES, YUNG-YU HSU, IMEC Leuven, Leuven, Belgium

G:P02 **Optical Fiber Based Structural Health Monitoring Systems in Electric Power Plants**
P. GASIOR, J. KALETAA, A. PRZYGODA, Wroclaw University of Technology, Wroclaw, Poland; RAFAKO SA Boiler Engineering Company, Raciborz, Poland

G:P03 **Polydopamine Microfluidics**
INSEONG YOU, HAESHIN LEE, Graduate School of Nanoscience & Technology (WCU), KAIST, Daejeon, Korea

G:HP04 **Harsh Environment SMART Sensor Systems**
L. DEL CASTILLO, H. MANOHARA, M. MOJARRADI, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, USA

G:HP05 **Safety Assessment of Bridge Structures using Ambient Vibration**
CHIN-HYUNG LEE, YOUNG-JUN YOU, KI-TAE PARK, BONG-CHUL JOO, BO-MI LEE, TAE-HEON KIM, Structural Engineering Research Division, Korea Institute of Construction Technology, Goyang-si, Gyeonggi-do, Korea

G:HP06 **A Roadmap for In Situ Structural Health Monitoring of ADF Aircraft**
S. GALEA, N. RAJIC, Air Vehicles Division, DSTO, Melbourne, Australia

SYMPOSIUM H

MINING SMARTNESS FROM NATURE

H:P02 **Bio-inspired Reinforcement Models from Nacre and Bamboo**
AN YUANLIN, LIU ZHIMING, WU WENJIAN, Department of Chemistry and Biology, College of Science, National University of Defense Technology, Changsha, China

H:P03 **Enhanced Mixing in the Asymmetric Bifurcation Tube Network Mimicking the Lung Airway**
M.Y. KANG, J.E. HWANG, **JIN W. LEE**, Dep't of Mech. Eng., POSTECH, Pohang, South Korea

H:P04 **Plant Surface with Anisotropic Frictional Properties**
E.V. GORB, S.N. GORB, University of Kiel, Kiel, Germany

H:P05 **Self-assembly Driven Enzyme Motion**
J.S. LECKIE, R.V. ULIJN, M.D. HAW, University of Strathclyde, Glasgow, UK

H:P06 **Mimicking Bone Architecture in a Metallic Structure**
T.S. GOIA, K.B. VIOLIN, J.C. BRESSIANI, A.H.A. BRESSIANI, Instituto de Pesquisas Energéticas e Nucleares, Sao Paulo, SP, Brazil

H:P07 **Novel Bionic Biomembrane Supported by Gold Nanoparticles /Cellulose Hybrid Films**
ZHIMING LIU, YUANLIN AN, WENJIAN WU, SHUAI SHU, Department of Chemistry and Biology, College of Science, National University of Defense Technology, Changsha, P.R. China

H:P08 **Creation of Biomimetic polymer thin films by Single Step Phase Separation Method**
JIAN-JE CHEN, QUOC-PHONG HO, **MENG-JIY WANG**, Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan, R.O.C.

H:P10 **Bio-inspired Active Electrolocation Sensors for Inspection of Tube Systems**
M. GOTTWALD, G. VON DER EMDE, Universität Bonn, Institut für Zoologie, Bonn, Germany

H:P11 **Design and Fabrication of Bio-inspired Artificial Cochlea**
WAN DOO KIM, SHIN HUR, WON JOON SONG, YOUNG DO JEONG, SUNG JAE BAE, Korea Institute of Machinery and Materials, Daejeon, Rep.of Korea

H:P12 **Gold Nanostructures on Flexible Substrates for Thrombin Detection**
H.-T. CHIU, **Y.-L. CHEN**, Dept. of Applied Chemistry, National Chiao Tung University, Hsinchu, Taiwan, R.O.C.; C.-Y. LEE, Dept. of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, R.O.C.

H:HP15 **From Super-hydrophobic to Super-hydrophilic. Self-cleaning and Anti-fog Transparent Materials with Plasma Nano-technology**
R. DI MUNDO[1], F. PALUMBO[2], R. D'AGOSTINO[1], [1]University of Bari, Bari, Italy; [2]IMIP-CNR, Italy

H:HP16 **A Single Step Lymphocyte Sorting Based on Molecular Computing on Cell Surface**
S. RUDCHENKO, M. RUDCHENKO, Hospital for Special Surgery; S.K. TAYLOR, M.N. STOJANOVIC, Columbia University, New York, NY, USA

SYMPOSIUM I

PROGRESS IN WEARABLE/WIRELESS AND IMPLANTABLE BODY SENSOR NETWORKS FOR HEALTHCARE APPLICATIONS

I:P01 **Towards ZnO-based Implantable Biosensing Devices**
S. ELZWAWI, H-K, KIM, R. HEINHOLD, **M.W. ALLEN**, Department of Electrical and Computer Engineering, University of Canterbury, Christchurch, New Zealand, and The MacDiarmid Institute for Advanced Materials and Nanotechnology, New Zealand

I:P03 **Implantable Measurement System for Dairy-cattle Monitoring with Long Recording Time**
A. BJARNASON, T. VUORELA, J. VERHO, J. RIISTAMA, J. VAISANEN, J. VANHALA, J. LEKKALA, J. HYTTINEN, Tampere University of Technology, Tampere, Finland

I:P04 **Basic Characteristics of RFID Antenna for Urination Detection**
H. NAKAJIMA, M. TAKAHASHI, K. SAITO, K. ITO, Chiba University, Chiba, Japan

SYMPOSIUM J

BIOMEDICAL APPLICATIONS OF "SMART" TECHNOLOGIES

J-1:P01 **Development of Nanosystems to Release Atenolol**
R.W. NOVICKIS, M.V. SURMANI MARTINS, L.F. DE MIRANDA, **R.R. RIBEIRO**, L. SILVA, A.H. MUNHOZ Jr., U.P. Mackenzie, São Paulo, Brazil

J-1:P02 **Development of Biocompatible Y-stabilized ZrO2 Fabricated by Spark Plasma Sintering**
H. SAKAI[1], T. ASAOKA[2], [1]Course of Intelligent Mechanical Engineering, Graduate School of Science and Engineering, Tokyo Denki University, Ishizaka, Saitama, Japan; [2]Department of Intelligent Mechanical Engineering, School of Science and Engineering, Tokyo Denki University, Ishizaka, Saitama, Japan

J-1:P04 **The Effect of Reaction Temperature and Surface Modification on Magnetite Nanoparticles**
K. PETCHAROEN, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

J-2:P05 **Apatite Coating on Titanium Samples by Powder Metallurgy**
C.G. AGREDA, M.W.D. MENDES, J.C. BRESSIANI, A.H.A. BRESSIANI, Instituto de Pesquisas Energéticas e Nucleares, IPEN-CNEN/SP, Brasil

J-3:P08 **High-sensitivity Detection for Biomarkers of a Pancreatic Cancer Using M13 Phage and Quantum-dot Nanocomplexes**
JANGWON SONG, YU CHAN KIM, HYUN KWANG SEOK, **KWAN HYI LEE**, Center for Biomaterials, KIST Biomedical Research Institute, Seoul, Korea

J-4:P11 **Effect of Surface Topography on Attachment and Growth Behaviors of Bone Cells Cultured on Novel Nanofibrous Replica Substrates**
P. EKABUTR, P. SUPAPHOL, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand; P. PAVASANT, Department of Anatomy, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand

J-4:P13 **Application of α-TCP/HAp Functionally Graded Porous Beads for Bone Regenerative Scaffold**
A. TAMURA[1], T. ASAOKA[1], K. FURUKAWA[2], T. USHIDA[2], T. TATEISHI[3], [1]Tokyo Denki University, Hiki, Japan; [2]University of Tokyo, Japan; [3]NIMS, Tukuba, Ibaraki, Japan

J-4:P14 **Development of Rotating-disk Electrospinning for High Throughput Production of PCL, PLA and PVA Nano-fibrous Scaffolds for Tissue Engineering Application**
J.J. NG, P. SUPAPHOL, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

J-4:P15 **Loading of Polilactide Electrospun Microfibers with Antioxidant Agents: Evaluation of the Effect on Cells under Oxidative Stress Conditions and Applications for DNA Purification**
E. LLORENS, J. PUIGGALÍ, L.J. DEL VALLE, Universitat Politecnica de Catalunya, Barcelona, Spain

J-4:P16 **Fabrication of Scaffold for Bone Regeneration by Taylor Made Stereolithography**
K. KUMAGAI[1], T. ASAOKA[2], [1]Course of Intelligent Mechanical Engineering, Graduate School of Science and Engineering, Tokyo Denki University, Hiki, Saitama, Japan; [2]Department of Intelligent Mechanical Engineering, School of Science and Engineering, Tokyo Denki University, Hiki, Saitama, Japan

J-5:P17 **Using Multifunctional Iron Oxide/Alumina Core/Shell Magnetic Nanoparticles as Affinity Probes and Photothermal Agents for Pathogenic Bacteria**
TSAI-JUNG YU, PO-HAN LI, TE-WEI TSENG, **YU-CHIE CHEN**, Department of Applied Chemistry, National Chiao Tung University, Hsinchu, Taiwan

J-5:P18 **Development of Cationic Poly(amino acid)s for Efficient Nucleic Acid Delivery**
K. MIYATA, H. UCHIDA, T. SUMA, T. ISHII, N. NISHIYAMA, K. KATAOKA, The University of Tokyo, Tokyo, Japan

J-5:P19 **Sol-gel Synthesis and Characterization of Lanthanide-substituted Nanostructured Calcium Hydroxyapatite**
I. BOGDANOVICIENE, M. MISEVICIUS, **A. KAREIVA**, Dept. of General and Inorganic Chemistry, Vilnius University, Vilnius, Lithuania; K. GROSS, Riga Biomaterials Innovation and Development Centre, Riga Technical Univ., Riga, Latvia; T.C.K. YANG, G.T. PAN, Dept. of Chemical Eng. and Biotechnology, National Taipei Univ. of Technology, Taipei, Taiwan; H.W. FANG, Inst. of Biotechnology, National Taipei Univ. of Technology, Taipei, Taiwan; J.C. YANG, Dept. of Dental Technology, Taipei Medical Univ., Taipei, Taiwan

J-5:P20 **Characterization of Hydrogels Based on PVP / Sodium Alginate Containing Pseudoboehmites Nanoparticles Treated with Octadecylamine for Pharmaco Applications**
L.F. de MIRANDA, A.H. MUNHOZ Jr., M.C. TERENCE, T.R. RIGOLIN, L. ENGEL, Mackenzie Presbyterian University, Sao Paulo, SP, Brazil

J-5:P21 **Calcium-alginate Hydrogel for Electrically Controlled Drug Release**
N. PARADEE, A. SIRIVAT, The Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand

J:HP23 **Development of Nanopatterned Surfaces to Control Bacterial Growth**
C. MARIE, C. BURHIN, K. GLINEL, UCL-Ecole Polytechnique de Louvain, Bio and Soft Matter, Louvain-la-neuve, Belgium

J:HP24 **Hybrid Materials Containing Mn or Co-doped ZnO Nanoparticles for Controlled Drug Release**
B.L. CAETANO[1], F. MENEAU[2], V. BRIOIS[2], S.H. PULCINELLI[1], C.V. SANTILLI[1], [1]Instituto de Química, UNESP, Araraquara, SP, Brazil; [2]Synchrotron SOLEIL L'Orme des Merisiers, Saint Aubin, Gif-sur Yvette, France

J:HP25 **Influence of Crystallinity and Fiber Orientation on Hydrophobicity and Biological Response of Poly(L-lactide) Electrospun Mats**
A.C. AREIAS, **C. RIBEIRO**, V. SENCADAS, N. GARCIA-GIRALT, A. DIEZ-PEREZ, J.L. GÓMEZ RIBELLES, S. LANCEROS-MÉNDEZ, Universidade do Minho, Departamento de Fisica, Braga, Portugal

J:HP26 **Reversible Peptide Binding to Temperature Responsive Hydrogel Particles**
HSIN-YI TSAI, A. LEE, **M. YATES**, University of Rochester, Dept. of Chemical Engineering, Rochester, USA

Notes

Social Programme

Opening Concert

"Nuovo Teatro Verdi"

Montecatini Terme

Monday June 11
21.30 - 23.30

The Opening Concert of CIMTEC 2012 will be performed by the "Orchestra Filarmonica Nazionale Italiana" (Italian National Philarmonic Orchestra) at the "Nuovo Teatro Verdi" of Montecatini Terme. The Orchestra is composed by about sixty players and soloists, directed by Maestro Andrea Colombini.

The programme will include pieces by: L.V. Beethoven, J. Strauss, G. Puccini, G. Verdi, W.A. Mozart
Soprano: Silvia Pacini and Susanna Menicucci
Bass: Tommaso Corvaia
Tenor: Nicola Simone Mugnaini
Director: Maestro Andrea Colombini

Entrance ticket for non-registered companions: 25.00 EUR

Opening Concert Programme

First Part

W.A. Mozart
Don Giovanni (ouverture)

G. Puccini
O mio Babbino Caro (from Gianni Schicchi)

G. Puccini
Recondita Armonia (from Tosca)

L.V. Beethoven
Fidelio (ouverture)

W.A. Mozart
Madamina il Catalogo è Questo (from Don Giovanni)

G. Puccini
Vissi d'Arte (from Tosca)

J. Strauss
Il Pipistrello (ouverture)

Second Part

W.A. Mozart
Le Nozze di Figano (ouverture)

G. Puccini
Ch'Ella mi Creda (from La Fanciulla del West)

W.A. Mozart
Non più Andrai Farfallone Amoroso
(from Le Nozze di Figaro)

G. Verdi
Brindisi (from La Traviata)

G. Puccini
Tu che di Gel sei Cinta (from Turandot)

G. Puccini
Nessun Dorma (from Turandot)

J. Strauss
Sul Bel Danubio Blu (valzer)

J. Strauss Sr.
Radetzky Marsch

“Caffè Concerto Strauss”

“Palazzo dei Congressi”

Auditorium

Wednesday June 13
21.30 - 23.30

Founded in 1988 “Caffè Concerto Strauss” is a group of international orchestral soloists specialised in repertoires that follow the style and interpretative modules of mittle European tradition of “Kaffe-hausen”. The group has made performances in the most important Italian theatres and abroad and cooperates with national and foreign musical institutions. The group is often invited to perform at the Italian national RAI-TV. As from several years it cures the musical services of the ships of the Costa Crociere and MSC Crociere, of the Caffè Florian and Caffè Lavena in Venice, and of the G.H. De Paris in Monte Carlo.

Ensemble: sextet
Violin Soloist and Art Director: Christian Pintilie
Soprano: Valentina Domenicali

Entrance ticket for non-registered companions: 15.00 EUR (subjected to place availability)

Caffè Concerto Strauss Programme

First Part

J. Strauss
Voci di Primavera (granvalzer)

J. Strauss
Tristch Trastch (polka schnell)

L. Bart
Valzer di Frou Frou (from Duchessa del Bal Tabarin)

V. Ranzato
O Cin Cin Là

J. Brahms
Danza Ungherese N° 5

G. Reverberi
Rondò Veneziano

J. Offenbach
Barkarole e Can-Can (from Orfeo all'Inferno)

H. Loewe
I Should Have Dance all Night (from My Fair Lady)

A. Khachaturian
La Danza delle Spade (from Gajané)

G. Enescu
Romanian Rapsody

Second Part

A. Lara
Granada

J. Webber
Memory (from music hall "Cats")

AA. VV./CCS
Le Sere di Mosca (poutpourri)

J. Louguy
La Vie en Rose

V. Monti
Czardas

De Curtis
Torn'a Surriento

A. Theodorakis
Sirtaki (from Zorba il Greco)

Conference Dinner

“Lidò Le Panteraie”

Thursday June 14
21.00 - 23.30

Entrance ticket for non-registered companions: 40.00 EURO (subjected to place availability)

Optional Tours

PISA

Monday June 11, afternoon
14.45 - 19.30

Shown is one of the loveliest architectural complexes in the world. On a large smooth lawn stands the Cathedral, the Baptistery and the famous Leaning Tower, a unique group of buildings in an unrivaled setting, the legacy of a past age which now belongs to all mankind. Along the southern side of the piazza lie the buildings of the old University, center of research and thought and famous for scientific disciplines.

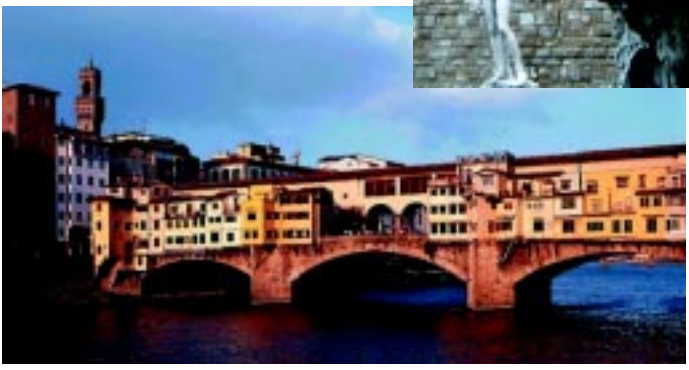
Meeting point: entrance of the "Palazzo dei Congressi" at 14.45. Return to Montecatini Terme at about 19.30.
The participation fee (30 EUR) includes transportation, city entrance tax, English speaking hostess and local guide.

FIRENZE (FLORENCE)

Tuesday June 12, full day
9.00 - 19.00

In the morning visit to the City Center. An unrivalled itinery of art and culture in the heart of Florence, Cathedral (Santa Maria del Fiore), with its Cupola by Brunelleschi, the Campanile (Bell Tower) by Giotto, and the Baptistery with the famous Gates of Paradise by Ghiberti and Andrea Pisano, Piazza della Signoria dominated by imposing Palazzo della Signoria flanked by the Loggia of Lanzi and the beautiful Neptune

Fountain, Ponte Vecchio, the Uffizi Gallery, etc.
In the afternoon, after lunch, visit to Poggio Imperiale, Piazzale Michelangelo and San Miniato Church.

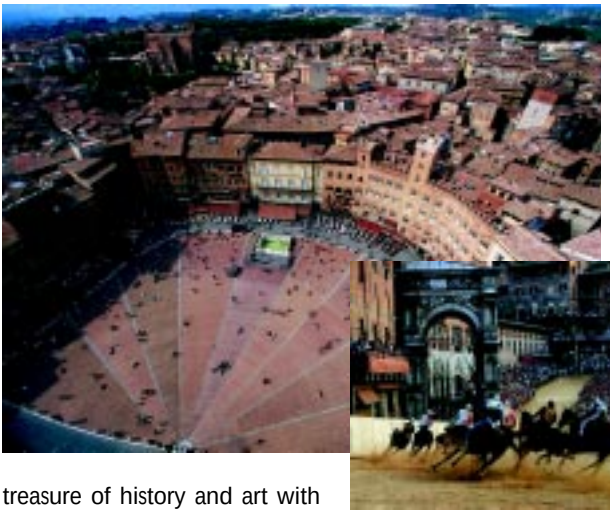


Meeting point: entrance of "Palazzo dei Congressi" at 9.00. Return to Montecatini Terme at about 19.00.
The participation fee (60 EUR) includes transportation, city entrance tax, English speaking hostess, local guide and lunch.

SIENA - SAN GIMIGNANO

Wednesday June 13, full day
9.00 - 19.30

Takes you through one of the most attractive landscapes of Central Italy, with wooded hills and valleys and the renowned Chianti area, famous throughout the world for its high-quality wines. Siena is a



treasure of history and art with its rich School of Sienese Painting, its marvellous Cathedral, the Palazzo Comunale rising majestically from the lovely fan-shaped Piazza del Campo, the Tower of Mangia, San Domenico, Piazza Salimbeni, Palazzo Ghigi, Piazza del Capitano, etc. It will leave unforgettable memories.
In the afternoon, visit to S. Gimignano, a small town famous for its numerous towers. It is a real gem of Medieval architecture which takes you back to the time of great battles and romantic love stories, as described by minstrels' tales.

Meeting point: entrance of "Palazzo dei Congressi" at 9.00. Return to Montecatini Terme at about 19.30.
The participation fee (65 EUR) includes transportation, cities entrance taxes, English speaking hostess, local guides and lunch.

LUCCA

Thursday June 14, morning
9.00 - 13.00

A monumental city still wound by intact walls containing unique art treasures. Lucca is the only among the Tuscany district cities to have maintained its independence until 1847. This allowed full preservation of the over 4 km perimetral walls (XVI-XVII Century) surrounding the city centre inclusive of 10 bastions, one gun platform and well conserved or restored battlements. The tour in the medieval city includes views of art monuments belonging to the different periods such as the Roman Theatre, the Basilica of San Frediano, the San Michele church and square, the Duomo of San Martino with sculptures of Jacopo della Quercia, the Guinigi tower, Fillungo street, and the Palazzo Ducale in Napoleone Square, the last to bear witness of Lucca Princedom.

Meeting point: entrance of "Palazzo dei Congressi" at 9.00. Return to Montecatini Terme at about 13.00.
The participation fee (30 EUR) includes transportation, city entrance tax, English speaking hostess and local guides.

1. Palazzo dei Congressi
2. Vittoria Congressi (Satellite Congress Center)
3. Central Railway Station
4. Lidò Le Panteraie

CIMTEC 2012


Flowsheet
JUNE 10
A.M. P.M.
JUNE 11
A.M. P.M.
JUNE 12
A.M. P.M.
JUNE 13
A.M. P.M.
JUNE 14
A.M. P.M.
SMART MATERIALS STRUCTURES & SYSTEMS
REGISTRATION
SYMPOSIUM A
Special Session A-10
Focused Session A-11
Focused Session A-12
Focused Session A-13
Special Session A-14
Focused Session A-15
SYMPOSIUM B
SYMPOSIUM C
SYMPOSIUM D
SYMPOSIUM E
SYMPOSIUM F
SYMPOSIUM G
Special Session G-6
SYMPOSIUM H
Special Session H-7
SYMPOSIUM I
SYMPOSIUM J
POSTER MOUNTING
POSTER DISCUSSION
SOCIALS
PLENARY SESSION
OPENING CONCERT
CAFFE CONCERTO STRAUSS
CONFERENCE DINNER

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