## Flowsheet

### Registration
- June 10, A.M.
- June 11, A.M.
- June 12, A.M.
- June 13, A.M.
- June 14, A.M.

### Symposiums
- FA
- FB
- FC
- FD
- FE
- FF
- FG
- FI
- FK
- FL
- FO
- FP

### Focused Sessions
- FB-6
- FK-10

### Plenary Sessions
- June 10, P.M.
- June 11, P.M.
- June 12, P.M.
- June 13, P.M.
- June 14, P.M.

### Posters
- June 10, A.M.
- June 11, A.M.
- June 12, A.M.
- June 13, A.M.
- June 14, A.M.

### Socials
- June 10, P.M.
- June 11, P.M.
- June 12, P.M.
- June 13, P.M.
- June 14, P.M.

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**Welcome Reception**
- June 10, A.M.
- June 12, A.M.
- June 14, A.M.

**Gala Concert**
- June 13, P.M.

**Conference Dinner**
- June 11, P.M.
- June 13, P.M.
- June 14, P.M.
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Level -2

RESTAURANT “IL VIZIO UNDERGROUND”

Level -1

POSTER SHOW

SALA RELATORI

AUDITORIUM VANNUCCI
Forum Outline

**Symposium FA**
Materials Issues in Flexible and Stretchable Electronics

**Symposium FB**
Towards Next Generation Solar Cells: Emerging Materials, Phenomena and Device Architectures
*Focused Session FB-6 Perovskite Photovoltaics*

**Symposium FC**
Hydrogen Production and Storage

**Symposium FD**
Materials Demands Towards New Generation Electrochemical Energy Storage Systems

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

**Symposium FF**
Progress in Materials and Devices for Direct Thermal-to-Electric Energy Conversion

**Symposium FG**
Magnetic Materials for Energy

**Symposium FH**
Advanced Photocatalytic Materials for Energy Transition, Solar-driven Chemistry and Environmental Applications

**Symposium FI**
Materials and Technologies for Next Generation Solid State Lighting
**Symposium FJ**
Development and Application of New Functional Transparent Conducting and Semiconducting Inorganic Materials

**Symposium FK**
Materials Challenges for Sustainable Nuclear Fission and Fusion Technologies

**Focused Session FK-10**
Materials Issues in Nuclear Waste Treatment and Disposal

**Symposium FL**
Biological, Biohybrid and Bioinspired Materials: From Electronics and Photonics to Medicine

**Serial Conferences**

**FM**
3rd International Conference
Emerging Materials, Technologies and Applications for Non-volatile Memory Devices

**FN**
6th International Conference
Novel Functional Carbon Nanomaterials

**FO**
8th International Conference
Science and Engineering of Novel Superconductors

**FP**
12th International Conference
Medical Applications of Advanced Biomaterials and Nano-biotechnology
Meeting Rooms by Symposia

OPENING SESSION ............................................. AUDITORIUM

Symposium FA .................................................. CORCIANO
Symposium FB .................................................. ASSISI A
Focused Session FB-6 ......................................... ASSISI A
Symposium FC .................................................. ASSISI B
Symposium FD .................................................. NORCIA
Symposium FE .................................................. SPELLO
Symposium FF .................................................. SALA RELATORI
Symposium FG .................................................. SPOLETO A
Symposium FH .................................................. SALA STAMPA
Symposium FI .................................................. BEVAGNA
Symposium FJ .................................................. CASCIA
Symposium FK .................................................. SPOLETO B
Focused Session FK-10 ....................................... VIP
Symposium FL .................................................. MAGIONE A
Conference FM ................................................ ORVIETO A
Conference FN ................................................ ORVIETO B
Conference FO ................................................ MONTEFALCO
Conference FP ................................................ MAGIONE B
Events by Day

Sunday June 10

15.00-19.00

REGISTRATION
Centro Congressi Hotel Quattrotorri
at Best Western Hotel Quattrotorri Perugia
Via Corcianese 260
Perugia - Italy

Monday June 11

Morning: 9.30-13.00

Opening Session
Welcome Addresses

Plenary Lectures (F:PL1-PL3)

8.30-13.00
POSTER MOUNTING
Monday  June 11

Afternoon:  14.25-18.30

Symposium FA  (FA-1:IL01-IL04)
Symposium FB  (FB-1.1:IL01-IL02)
(FB-1.2:IL02-IL04)
Symposium FC  (FC-1.1:IL01-IL02)
(FC-1.3:IL01-IL03)
(FC-2.7:IL01)
Symposium FD  (FD-1:IL01-IL03)
(FD-1:IL04)
Symposium FE  (FE-1:IL01-IL02)
(FE-1:IL03)
Symposium FF  (FF-1:IL01-IL02)
(FF-1:IL03-IL04)
Symposium FG  (FG-1:IL01-IL03)
(FG-1:IL04-IL05)
(FG-3:IL03)
Symposium FH  (FH-1:IL01-IL02)
(FH-1:IL03-IL04)
Symposium FI  (FI-1:IL01+IL04)
Symposium FJ  (FJ-1:IL01+IL03)
(FJ-1:IL04)
Symposium FK  (FK-1:IL01-IL02)
(FK-3:IL01-IL02)
Symposium FL  (FL-1:IL01-IL02)
(FL-1:IL03-IL04)
Conference FM  (FM-3:IL01-IL04)
(FM-3:IL05-IL07)
Conference FN  (FN-1:IL01-IL03)
(FN-1:IL05-IL06)
Conference FO  (FO-1:IL01-IL03)
(FO-2:IL01-IL03)
Conference FP  (FP-1:IL01-IL02)
(FP-1:IL03+IL05)

14.30-18.30
POSTER MOUNTING

20.30 - 22.00
Welcome Party
Tuesday June 12

Morning: 9.00-13.00

Symposium FA
(FA-1:IL05-L07)
(FA-2:IL06-IL07)
(FA-3:IL07)

Symposium FB
(FB-2:IL01-IL03)
(FB-5:IL01)
(FB-1.2:IL05-L08)

Symposium FC
(FC-1.2:IL02+IL04)
(FC-1.1:IL04-IL05)
(FC-1.4:L01)

Symposium FD
(FD-1:IL06-L08)
(FD-1:IL09-IL10)
(FD-2:IL04)

Symposium FE
(FE-1:IL06-L10)
(FE-1:IL11-L12)

Symposium FF
(FF-1:IL05-IL06)
(FF-1:IL07)
(FF-2:IL02)

Symposium FG
(FG-1:IL07-IL09)
(FG-1:IL10-IL12)

Symposium FH
(FH-1:IL05-IL07)
(FH-2:IL01-IL02+L07)

Symposium FI
(FI-1:IL05-L07)
(FI-1:IL08-IL09)

Symposium FJ
(FJ-1:IL06-IL08)
(FJ-1:IL09-IL10)

Symposium FK
(FK-1:IL04-IL08)
(FK-2:IL01-L04)
(FK-10.1:IL01-IL03)
(FK-10.1:IL04-L06)

Symposium FL
(FL-1:IL05-IL06)
(FL-1:IL07-L08)

Conference FM
(FM-1:IL01)
(FM-3:IL08+L12)
(FM-3:IL09-L10+L16)

Conference FN
(FN-1:IL07-IL09)
(FN-1:IL12-L15)

Conference FO
(FO-1:IL04-IL06)
(FO-3:IL01-IL04)

Conference FP
(FP-1:IL06-IL08)
(FP-1:IL09)
(FP-2:IL02)
Tuesday  June 12

Afternoon:  14.30-18.30

Symposium FA  (FA-1:IL11-L13)  
                (FA-2:IL01-IL02)
Symposium FB  (FB-1.3:IL01-L04)  
                (FB-3:IL01-L03)
Symposium FC  (FC-2.6:IL01-L02)  
                (FC-2.1:IL01-IL02)
Symposium FD  (FD-1:IL14-IL15)  
                (FD-1:IL21)
Symposium FE  (FE-1:IL14)  
                (FE-2:IL01)  
                (FE-2:IL02)
Symposium FF  (FF-2:IL04+IL09)  
                (FF-1:IL08+L10+IL09)
Symposium FG  (FG-2:IL02-IL04)
Symposium FH  (FH-1:IL08-L10)  
                (FH-2:IL03-IL04)
Symposium FI  (FI-1:IL10-L13)
Symposium FJ  (FJ-2:IL01-IL02)  
                (FJ-2:IL03)  
                (FJ-3:IL04)
Symposium FK  (FK-3:IL03-IL06)  
                (FK-5:IL01-L03)  
                (FK-10.2:IL01-IL04)
Symposium FL  (FL-1:IL10-IL11)  
                (FL-2:IL01-IL02)
Conference FM  (FM-3:IL17-IL19)  
                (FM-2:IL01-L04)
Conference FN  (FN-2:IL02-IL03)  
                (FN-4:IL01-L04+L11)
Conference FO  (FO-2:IL04-IL05)  
                (FO-3:IL06-L09)
Conference FP  (FP-1:IL12-L16)  
                (FP-3:IL01-IL02)
Wednesday  June 13

**Morning**: 9.00-13.00

Symposium FA  (FA-2:IL04-IL05)  (FA-1:IL08-IL09)
Symposium FB  (FB-6.1:IL01-IL04)  (FB-6.3:IL01-IL02)
Symposium FC  (FC-2.2:IL02-IL05)  (FC-2.3:IL01-IL03)
Symposium FD  (FD-1:IL16-IL18)  (FD-1:IL19-IL20)
Symposium FE  (FE-2:IL04-IL06)  (FE-2:IL07-IL08)
Symposium FF  (FF-3:IL01-IL04)  (FF-2:IL03+IL08)
Symposium FG  (FG-2:IL05-IL07)  (FG-2:IL08)  (FG-3:IL02)
Symposium FH  (FH-2:IL05-IL06)  (FH-3:IL01-IL02)
Symposium FI  (FI-2:IL01-IL03)  (FI-2:IL04-IL05)
Symposium FJ  (FJ-2:IL06-IL08)  (FJ-2:IL09-IL11)
Symposium FK  (FK-5:IL04-IL07)  (FK-5:IL09-IL10)  (FK-10.3:IL01-IL02)  (FK-10.3:IL03)  (FK-10.4:IL01)
Symposium FL  (FL-3:IL01-IL02)  (FL-3:IL04)
Conference FM  (FM-2:IL10-IL14)  (FM-2:IL05-IL09)
Conference FN  (FN-3:IL02-IL05)  (FN-3:IL06-IL09)
Conference FO  (FO-3:IL10-IL11)  (FO-4:IL02-IL03)  (FO-5:IL03)
Conference FP  (FP-2:IL04-IL08)  (FP-4:IL01-IL03)
Wednesday  June 13

Afternoon:  14.30-18.30

Symposium FA  (FA-3:IL01+IL04)  (FA-3:IL05-IL06)
Symposium FB  (FB-3:IL06)  (FB-4:IL01)  (FB-4:IL02)  (FB-5:IL02)
Symposium FC  (FC-2:2:IL06-IL07)  (FC-2:2:IL08)  (FC-2:5:IL02)
Symposium FD  (FD-2:IL01-L03)
Symposium FE  (FE-2:IL11-L12)
Symposium FF  (FF-2:IL10-L12)  (FF-3:IL05-IL06)
Symposium FG  (FG-3:IL04-IL06)  (FG-3:IL07-IL09)
Symposium FH  (FH-2:IL08+IL11)
Symposium FI  (FI-2:IL07-IL08)  (FI-2:IL09-L10)
Symposium FJ  (FJ-2:IL12b-IL15)  (FJ-2:IL16-L17)
Symposium FK  (FK-6:IL01-IL03)  (FK-8:IL01-IL02)
Symposium FL  (FL-3:IL06-IL07)  (FL-3:IL08-IL09)
Conference FN  (FN-2:IL04-L08)  (FN-4:IL05-IL06)
Conference FO  (FO-4:IL06-IL07)  (FO-6:IL01)
Conference FP  (FP-3:IL03+IL05)  (FP-3:IL04)  (FP-5:IL01)

21.30-23.30  
Opera Concert
Thursday June 14

**Morning:** 9.00-13.00

**Symposium FA**
- (FA-3:IL08-L09)
- (FA-3:IL10-IL11)

**Symposium FB**
- (FB-6.2:IL01-IL02)
- (FB-6.4:IL01-IL02)
- (FB-6.5:IL01+IL04)

**Symposium FC**
- (FC-2.1:IL04-L06)
- (FC-2.4:IL01+IL03)
- (FC-2.7:IL03)

**Symposium FD**
- (FD-2:IL05)
- (FD-3:IL02-IL03)

**Symposium FE**
- (FE-3:IL01-IL03)
- (FE-3:IL04-IL05)

**Symposium FF**
- (FF-2:IL05-IL07)
- (FF-3:IL02+IL09)

**Symposium FG**
- (FG-3:IL10-IL12)
- (FG-3:IL13-IL14)

**Symposium FI**
- (FI-3:IL01-IL02)
- (FI-3:IL04)

**Symposium FJ**
- (FJ-2:IL18-L21)
- (FJ-3:IL01-IL02)

**Symposium FK**
- (FK-6:IL05-L09)
- (FK-6:IL10-L14)

**Symposium FL**
- (FL-3:IL10-IL11)
- (FL-4:IL01-IL03)

**Conference FM**
- (FM-2:IL23-IL25)
- (FM-1:IL10+IL02-IL06)

**Conference FN**
- (FN-4:IL07-IL10)
- (FN-4:IL12-L15)

**Conference FO**
- (FO-5:IL01-IL02)
- (FO-5:IL04-IL05)

**Conference FP**
- (FP-4:IL04+IL07)
- (FP-5:IL04+IL07)
Thursday June 14

Afternoon: 14.30-18.30

Symposium FE (FE-3:IL06-IL07)
Symposium FF (FF-3:IL10-IL12)
Symposium FG (FG-4:IL01-IL04)
Symposium FI (FI-4:IL01-IL03)
Symposium FJ (FJ-1:IL02)
(FJ-3:IL05)
(FJ-3:IL06-IL07)
Symposium FK (FK-7:IL02-L03)
(FK-7:IL04-IL06)
Symposium FL (FL-4:IL06-IL08)
Conference FM (FM-1:IL07+IL11-L12)
Conference FN (FN-4:IL16-IL19)
(FN-4:IL20-IL22)
Conference FO (FO-7:IL01-IL04)

16.30-18.30
POSTER DISCUSSION

20.30-23.00
Conference Dinner
SESSIONS FLOWSHEET
June 10-14
8th Forum on
New Materials

Chair
Pietro Vincenzini
World Academy of Ceramics
National Research Council, Italy

Co-Chair
Robert P.H. Chang
Northwestern University, USA
International Union of Materials Research Societies

Conveners
Symposium FA: Mario Caironi, Italy
Symposium FB: Santosh Shrestha, Australia
Focused Session FB-6: Tsutomu Miyasaka, Japan
Symposium FC: Andreas Zuettel, Switzerland
Symposium FD: Arumugam Manthiram, USA
Symposium FE: Antonino S. Aricò, Italy
Symposium FF: Yuzuru Miyazaki, Japan
Symposium FG: Franca Albertini, Italy
Symposium FH: Gabriele Centi, Italy
Symposium FI: Michele Muccini, Italy
Symposium FJ: Andriy Zakutayev, USA
Symposium FK: Hua-Tay Lin, China
Focused Session FK-10: Kevin Fox, USA
Symposium FL: Gianluca Farinola, Italy
Conference FM: Sabina Spiga, Italy
Conference FN: Yury Gogotsi, USA
Conference FO: Davor Pavuna, Switzerland
Conference FP: Thomas Webster, USA
OPENING SESSION

AUDITORIUM

Chair:
Morinobu ENDO, Japan

9.30 - 10.00
Welcome Addresses

Michele FIORONI
Deputy Mayor of the Municipality of Perugia

Maurizio PERUZZINI
CNR, National Research Council of Italy

Dario DELLA SALA
ENEA, Italian National Agency for New Technologies, Energy and the Environment

Robert P.H. CHANG
International Union of Materials Research Societies

Masahiro YOSHIMURA
World Academy of Ceramics

Plenary Lectures

10.00 - 10.55
F:PL1
Integrated Quantum Materials and Devices
Robert M. WESTERVELT
Center for Integrated Quantum Materials, Harvard University, Cambridge, MA, USA

11.00 - 11.55
F:PL2
Ultraflexible and Stretchable Electronics for Microvolt Biosignal Monitoring Systems
Tsuyoshi SEKITANI
The Institute of Scientific and Industrial Research, Osaka University, Ibaraki, Osaka, Japan

12.00 - 12.55
F:PL3
Mesoscopic Photosystems for the Generation of Electricity and Fuels from Sunlight
Michael GRAETZEL
Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland
MONDAY JUNE 11 AFTERNOON

SYMPOSIUM FA
MATERIALS ISSUES IN FLEXIBLE AND STRETCHABLE ELECTRONICS

Room: CORCIANO
Chair: Mario CAIRONI, Italy (Convener)

14.25 Welcome

Session FA-1 - Materials and Fabrication Processes

14.30 FA-1:IL01 Material Challenges for Printed Electronics in the Microwave Domain
C. ARMIENTO, Alkim Akyurtlu University of Massachusetts, Lowell, MA, USA

15.10 FA-1:IL02 Soft and Flexible Bioelectronics
R.A. GREEN, J.A. GODING, Imperial College London, London, UK

15.50 FA-1:IL04 Organic Bioelectronic Textiles in Health Monitoring Devices
E. ISMAILOVA, Department of Bioelectronics, Ecole Nationale Supérieure des Mines de Saint Etienne, CMP-EMSE, MOC, Gardanne, France
MONDAY JUNE 11 AFTERNOON

SYMPOSIUM FB
TOWARDS NEXT GENERATION SOLAR CELLS: EMERGING MATERIALS, PHENOMENA AND DEVICE ARCHITECTURES

Room: ASSISI A

Chair: Santosh SHRESTHA, Australia (Convener)

14.25 Welcome

Session FB-1 - Thin-film Photovoltaics

14.30 FB-1.1:IL01 Optimal Atomic Structure of Amorphous Silicon Obtained from Density Functional Theory Calculations
P. PEDERSEN1, L. PIZZAGALLI2, H. JONSSON1, 1Faculty of Physical Sciences and Science Institute, University of Iceland, Reykjavik, Iceland 2Dept. of Physics and Mechanics of Materials, Institut P’, CNRS-Université de Poitiers UPR 3346, SP2MI, Futuroscope Chasseneuil Cedex, France

15.00 FB-1.1:IL02 Atomic layer Deposited Nanolayers to Enhance Silicon Photovoltaics
E. KESSELS, B. MACCO, Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands

15.30 Break

Chair: Hannes JONSSON, Iceland

16.00 FB-1.2:IL02 New Disruptive Design of CIGS(e) Solar Cells Based on Advanced Surface Techniques Structures and Layers used in Silicon Solar Technology
B. VERMANG et al., University of Hasselt and imec, Diepenbeek, Belgium

16.30 FB-1.2:IL03 Combination of Heat-light Soaking and Light Soaking for Performance Improvement of Cu(In,Ga)(S,Se)2 Solar Cell
JAKAPAN CHANTANA1; TAKUYA KATO2, HIROKI SUGIMOTO2, TAKASHI MINEMOTO1, 1Department of Electrical and Electronic Engineering, Ritsumeikan University, Shiga, Japan; 2Atsugi Research Center, Solar Frontier K. K., Atsugi, Kanagawa, Japan

17.00 FB-1.2:IL04 Sprayed Non-doped and Ga-doped ZnO Films for CulnGaSe2 Solar Cells
KENJI YOSHINO, University of Miyazaki, Miyazaki, Japan
MONDAY  JUNE 11  AFTERNOON

SYMPOSIUM FC
HYDROGEN PRODUCTION AND STORAGE

Room:  ASSISI B

Chair:  Andreas ZUETTEL, Switzerland (Convener)

14.25  Welcome

Session FC-1 - Hydrogen Production

14.30  FC-1.1:IL01  New Materials and Concepts for Photocatalytic and Photoelectrochemical H2 Production
G. MUL, KAI HAN, YUXI GUO, K. WENDERICH, A. BELTRAM*, I. SIRETANU*, B. MEI, F. MUGELE, University of Twente, Faculty of Science and Technology PCS & PCF* groups, Enschede, The Netherlands

15.00  FC-1.1:IL02  Solution-processed Photocathode for Direct Solar Water Reduction
K. SIVULA, Institute of Chemical Sciences and Engineering Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

15.30  Break

Chair:  Kevin SIVULA, Switzerland

16.00  FC-1.3:IL01  Catalytic Power-to-Gas Technologies for Storing Hydrogen with Biomass
O. KROECHER, F. VOGEL, T. SCHILDHAUER, Paul Scherrer Institute, Villigen PSI, Switzerland

16.30  FC-1.3:IL02  Hydrogen Production from Biobased Compounds on Smart Ni Based Catalysts
L. JALOWIECKI-DUHAMEL, Univ. Lille, CNRS, Centrale Lille, ENSC, Univ. Artois, UMR 8181-UCCS-Unité de Catalyse et Chimie du Solide, Lille, France

17.00  FC-1.3:LO3  Mixed electronic- and Protonic-conducting Composites for Hydrogen Separation Ceramic Membranes
Y.N. BESPALKO, V.A. SADYKOV, P.I. SKRYABIN, A.V. KRASNOV, E.M. SADOVSKAYA, N.F. EREMEEV, Boreskov Institute of Catalysis, Novosibirsk, Russia; N.F. UVAROV, A.S. ULIHHIN, Institute of Solid State Chemistry and Mechanochemistry, Novosibirsk, Russia

Session FC-2 - Hydrogen Storage

17.20  FC-2.7:IL01  Scaled-up Materials Synthesis and Testing of Hydrogen Storage Tanks based on Nanostructured Hydrides
M. DORNHEIM, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany
MONDAY JUNE 11 AFTERNOON

SYMPOSIUM FD
MATERIALS DEMANDS TOWARDS NEW GENERATION ELECTROCHEMICAL ENERGY STORAGE SYSTEMS

Room: NORCIA

Chair: Arumugam MANTHIRAM, USA (Convener)

14.25 Welcome

Session FD-1 - Batteries

14.30 FD-1:IL01 Advances in Na-ion Batteries
T. ROJO, Department of Inorganic Chemistry, Faculty of Science and Technology, University of the Basque Country (UPV/EHU), Bilbao, Spain; and CIC energigUNE, Parque Tecnológico de Álava, Miñano, Spain

15.10 FD-1:IL02 Materials for Advanced Lithium and Lithium-ion Batteries for NASA’s Future Missions
R. BUGGA, M. SMART, W. WEST, E. BRANDON, R. EWELL, R. SURAMPUDI, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

15.50 FD-1:L03 MgH2-TiH2 Nanocomposites as a Conversion Material for Conventional or Solid State Li-ion Battery Anodes
F. CUEVAS, J. ZHANG, M. LATROCHE, Université Paris Est, ICMPE, CNRS-UPEC, Thiais, France

16.20 Break

Chair: Giuseppe A. ELIA, Germany

16.50 FD-1:IL04 Complex Hydrides as Electrolytes for Lithium-ion Batteries
D. GREGORY, WestCHEM, School of Chemistry, University of Glasgow, Glasgow, UK

17.30 FD-1:L05 Li Insertion into Li4Ti5O12 Spinel Prepared by Low Temperature Solid State Route: Charge Capability vs Surface Area
M. ZUKALOVA, L. KAVAN, J. Heyrovsky Institute of Physical Chemistry, CAS, Prague, Czech Republic; M. FABIAN, Institute of Geotechnics, SAS, Košice, Slovak Republic; M. KLEMENTOVA, Institute of Physics of CAS, Prague, Czech Republic; M. SENNA, Faculty of Science and Technology, Keio University, Yokohama, Japan
MONDAY JUNE 11 AFTERNOON

SYMPOSIUM FE
FUEL CELLS: MATERIALS AND TECHNOLOGY CHALLENGES

Room: SPELLO

Chair: Antonino S. ARICÒ, Italy (Convener)

14.25 Welcome

Session FE-1 - Solid Oxide Fuel Cells (SOFCs)

14.30 FE-1:IL01 Development and In-situ Characterization of Fast Ion Conductors for SOFCs
S. SKINNER, Imperial College London, London, UK

15.10 FE-1:IL02 Architecturally Designed La2-xPrxNiO4+δ Cathodes for SOFCs
E. DJURADO, N.I. KHAMIDY, R.K. SHARMA, Institute of Engineering Univ. Grenoble Alpes, LEPMI, Grenoble, France

15.50 Break

Chair: Stephen SKINNER, UK

16.20 FE-1:IL03 Perovskite Electrodes for SOFCs Powered by Biogas
E. DI BARTOLOMEO, University of Rome Tor Vergata, Department of Chemical Science and Technologies, Rome, Italy

17.00 FE-1:IL04 Metal Supported Fuel Cells: Improved Electrochemical Performance by Improved Processing
M. BRAM1,2, F. THALER1,2, D.UDOMSILP1,2, C. BISCHOF1, A.K. OPITZ1,2, 1Christian Doppler Laboratory for Interfaces in Electrochemical Energy Converters; 2Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research - Materials Synthesis and Processing (IEK-1), Jülich, Germany; 3Vienna University of Technology, Institute of Chemical Technologies and Analytics, Vienna, Austria
MONDAY JUNE 11 AFTERNOON

SYMPOSIUM FF
PROGRESS IN MATERIALS AND DEVICES FOR
DIRECT THERMAL-TO-ELECTRIC ENERGY
CONVERSION

Room: SALA RELATORI

Chair: Yuzuru MIYAZAKI, Japan (Convener)

14.25 Welcome

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

14.30 FF-1:IL01 Thermoelectrics in Strongly Correlated Electron Systems
ICHIRO TERASAKI, Department of Physics, Nagoya University, Nagoya, Japan

15.10 FF-1:IL02 Electronic Structure Calculations of Energy Converting Alloys by KKR-CPA Method
J. TOBOŁA, S. KAPRZYK, M. RYBSKI, B. WIENDLOCHA, AGH University of Science and Technology, Faculty of Physics and Applied Computer Science, Krakow, Poland

15.50 Break

Chair: Ichiro TERASAKI, Japan

16.20 FF-1:IL03 Optimization of Nanostructured Thermoelectrics through Computer Simulations
K. TERMENTZIDIS, CETHIL UMR 5008, CNRS, INSA of Lyon, Villeurbanne, France

17.00 FF-1:IL04 High Throughput DFT Calculations - Screening for New TE Compounds
G.K.H. MADSEN, Institut für Materialchemie, TU Wien, Vienna, Austria
MONDAY  JUNE 11  AFTERNOON

SYMPOSIUM FG

MAGNETIC MATERIALS FOR ENERGY

Room:  SPOLETO A

Chair:  Franca ALBERTINI, Italy (Convener)

14.25  Welcome

Session FG-1 - Hard Magnetic Materials

14.30  FG-1:IL01  New Research Strategies in RE-based Magnets  
A.M. GABAY, G.C. HADJIPANAYIS, University of Delaware, Newark,  
DE, USA

15.00  FG-1:IL02  High-performance Permanent Magnets without Rare  
Earths: Challenges and Perspectives  
K.P. SKOKOV, O. GUTFLEISCH, Technische Universität Darmstadt,  
Institut für Materialwissenschaft, Darmstadt, Germany

15.30  FG-1:IL03  Multidriver Processing Routes to Chemical Order  
in FeNi  
L.H. LEWIS, Northeastern University, Boston, MA, USA

16.00  Break

Chair:  Laura H. LEWIS, USA

16.30  FG-1:IL04  Heusler Compounds: Towards Rare-Earth-Free  
Permanent Magnets  
C. FELSER, A. MARKOU, Max Planck Institute for Chemical Physics  
of Solids, Dresden, Germany

17.00  FG-1:IL05  Intrinsic Magnetic Properties of RFe12 Based Hard  
Magnetic Phase  
YUSUKE HIRAYAMA, Magnetic Powder Metallurgy Research  
Center, National Institute of Advanced Industrial Science and  
Technology, Nagoya, Japan

Session FG-3 - Magnetocaloric and Multifunctional  
Magnetic Materials

17.30  FG-3:IL03  Tuning Magnetocaloric Materials with Stress  
X. MOYA, Department of Materials Science, University of  
Cambridge, Cambridge, UK
MONDAY  JUNE 11  AFTERNOON

SYMPOSIUM FH
ADVANCED PHOTOCATALYTIC MATERIALS
FOR ENERGY TRANSITION, SOLAR-DRIVEN
CHEMISTRY AND ENVIRONMENTAL
APPLICATIONS

Room: SALA STAMPA

Chair: Gabriele CENTI, Italy (Convener)

14.25  Welcome

Session FH-1 - Design Elements and Advanced Concepts for Photofunctional Materials

14.30  FH-1:IL01   Electrochemical Oxygen & Chlorine Production: Enhancing Electro-catalytic Activity Using Atomic Layer Deposition
M.R. HOFFMANN, Division of Engineering & Applied Science, California Institute of Technology, Pasadena, CA, USA

15.10  FH-1:IL02   Ultra-efficient Solar CO2 Conversion using Oxide Semiconductor Electrodes
UNSEOCK KANG1,2, SEUNG YO CHOI1,2, HYE WON JEONG1,2, GUANGXIA PIAO1,2, DONG SUK HAN3, HYUNWOONG PARK1,2, 1School of Energy Engineering, Kyungpook National University, Daegu, South Korea; 2School of Architectural, Civil, Environmental, and Energy Engineering, Kyungpook National University, Daegu, South Korea; 3Chemical Engineering Program, Texas A&M University at Qatar, Education City, Doha, Qatar

15.50  Break

Chair: Michael R. HOFFMANN, USA

16.20  FH-1:IL03   Nanocomposite Materials as Photoelectrodes in Solar Fuel Generation: Opportunities and Challenges
C. JANAKY, E. KECSENOVIĆ, B. ENDRODI, University of Szeged, Szeged, Hungary

17.00  FH-1:IL04   Role of Electron Traps in Photocatalysis: Identification and Characterization of Metal Oxide Particulate Photocatalysts
BUNSHO OHTANI, Institute for Catalysis, Hokkaido University, Sapporo, Japan
MONDAY JUNE 11 AFTERNOON

SYMPOSIUM FI
MATERIALS AND TECHNOLOGIES FOR NEXT GENERATION SOLID STATE LIGHTING

Room: BEVAGNA
Chair: Michele MUCCINI, Italy (Convener)

14.55 Welcome

Session FI-1 - Material Design and Processing

15.00  FI-1:IL01 Intramolecular or Intermolecular Charge Transfer Approaches for Highly Efficient TADF Materials and OLEDs
KEN-TSUNG WONG, Department of Chemistry, National Taiwan University, Taipei, Taiwan

15.40  FI-1:IL04 Design of Efficient TADF Materials for OLEDs
TAKUMA YASUDA, Kyushu University, Fukuoka, Japan
MONDAY JUNE 11 AFTERNOON

SYMPOSIUM FJ

DEVELOPMENT AND APPLICATION OF NEW FUNCTIONAL TRANSPARENT CONDUCTING AND SEMICONDUCTING INORGANIC MATERIALS

Room: CASCIA

Chair: Andriy ZAKUTAYEV, USA (Convener)

14.25 Welcome

Session FJ-1 - Fundamentals

14.30 FJ-1:IL01 Interfaces and Defects in Semiconducting Oxides
A. KLEIN, Technische Universität Darmstadt, Institute of Materials Science, Darmstadt, Germany

15.10 FJ-1:IL03 A Non-oxide p-type Transparent Semiconductor CuI
NAOOMI YAMADA, Department of Applied Chemistry, Chubu University, Kasugai, Japan

15.50 Break

16.20 FJ-1:IL04 Atomic Layer Deposition of Transparent Conducting and Charge Transport Layers for Photovoltaic Applications
M. McCARTHY, L. RYAN, S. O’BRIEN, I.M. POVEY, Tyndall National Institute, University College Cork, Cork, Ireland
MONDAY  JUNE 11  AFTERNOON

SYMPOSIUM FK

MATERIALS CHALLENGES FOR SUSTAINABLE NUCLEAR FISSION AND FUSION TECHNOLOGIES

Room:  SPOLETO B

Chair:  Hua-Tay LIN, China (Convener)

14.25  Welcome

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

14.30  FK-1:IL01  Novel Materials and Advanced Design Concepts for DEMO Divertor Targets

JEONG-HA YOU, B. BOSWIRTH, H. GREUNER, M. LI. A.V. MÜLLER, Max Planck Institute for Plasma Physics, Garching, Germany; E. VISCA, F. CRESCENZI, S. ROCCCELLA, ENEA, Dept. Fusion & Technology for Nuclear Safety, Frascati, Italy; CH. VORPAHL, EUROfusion, PMU PPPT, Garching, Germany; T. BARRETT, CCFE, Culham Science Centre, Abingdon, UK; F. GALLAY, M. RICHOU, CEA, IRFM, Saint Paul Lez Durance, France; J. REISER, KIT, IAM, Eggenstein-Leopoldshafen, Germany

15.00  FK-1:IL02  High-temperature Fracture Behaviour of High Chromium Ferritic-martensitic and Nanostructured Ferritic Alloys

THAK SANG BYUN, JUNG PYUNG CHOI, Pacific Northwest National Laboratory, Richland, WA, USA; D.T. HOELZER, Oak Ridge National Laboratory, Oak Ridge, TN, USA; S.A. MALOY, Los Alamos National Laboratory, Los Alamos, NM, USA

15.30  Break

Chair:  Sebastijan BREZINSEK, Germany

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

16.00  FK-3:IL01  Tungsten Materials for Plasma-facing Components - Status and Research Directions

CH HENAGER Jr., RJ KURTZ, BN NGUYEN, PNNL, Richland, WA, USA; GR ODETTE, UCSB, Santa Barbara, CA, USA

16.30  FK-3:IL02  Advanced Tungsten Materials for Plasma-facing Components of Future Fusion Devices

R. NEU, A. FEICHTMAYER, H. GIETL, Max-Planck-Institut für Plasmaphysik, Garching, Germany, and Technische Universität München, Garching, Germany; J. RIESCH, M. BALDEN, S. ELGETI, T. HOESCHEN, M. LI, S. OLBIRICH, Max-Planck-Institut für Plasmaphysik, Garching, Germany; J. ALMANSTÖTTER, OSRAM GmbH, SP PRE PLM DMET, Schwabmünchen, Germany; J.W. COENEN, Y. MAO, L. RAUMANN, Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung - Plasmaphysik, Partner of the Trilateral Euregio Cluster (TEC), Jülich, Germany
MONDAY   JUNE 11   AFTERNOON

SYMPOSIUM FL
BIOLOGICAL, BIOHYBRID AND BIOINSPIRED MATERIALS: FROM ELECTRONICS AND PHOTONICS TO MEDICINE

Room: MAGIONE A

Chair: Gianluca FARINOLA, Italy (Convener)

14.25 Welcome

Session FL-1 - Classes of Materials and their Synthesis and Chemical Modification

14.30 FL-1:IL01 Biopolymer based Electrodes for Wooden Batteries and Super Capacitors
O. INGANAS, Biomolecular and organic electronics, Dept. Physics, Chemistry and Biology, Linköpings Universitet, Linköping, Sweden

15.30 FL-1:IL02 Biosilica from Diatoms: Smart Materials from Biomedicine to Photonics
R. RAGNI, Dipartimento di Chimica, Università degli Studi di Bari “Aldo Moro”, Bari, Italy

16.10 Break

Chair: Olle INGANAS, Sweden

16.40 FL-1:IL03 Mussel and Plant Polyphenol Inspired Materials: From Molecular Phenomena to Applications
P.B. MESSERSMITH, University of California, Berkeley, CA, USA

17.20 FL-1:IL04 Molecular Bases of Cadherin-mediated Cell-cell Adhesion
E. PARISINI, Center for Nano Science and Technology @Polimi, Istituto Italiano di Tecnologia, Milano, Italy
MONDAY JUNE 11 AFTERNOON

FM - 3rd International Conference

EMERGING MATERIALS, TECHNOLOGIES AND APPLICATIONS FOR NON-VOLATILE MEMORY DEVICES

Room: ORVIETO A

Chair: Sabina SPIGA, Italy (Convener)

14.25 Welcome

Session FM-3 - Emerging Applications for Non-volatile Memories

14.30 FM-3:IL01 Learning in Spiking Neural Networks using Phase Change Memory Synapses
B. RAJENDRAN, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ, USA

15.00 FM-3:IL15 Interfacing Organic Memristors with Neurons in a Bio-hybrid Network
S. IANNOTTA, S. BATTISTONI, V. EROKHIN, CNR-IMEM, Parma, Italy

15.30 FM-3:IL03 RRAM Based New Computing Paradigms
JINFENG KANG, P. HUANG, R.Z. HAN, C. LIU, Y.N. JIANG, Z. ZHOU, Y.C. XIANG, L.F. LIU, X.Y. LIU, Peking University, Beijing, China

16.00 FM-3:IL04 Diffusive Memristor as a Building Block for a Novel True Random Number Generator
QIANGFEI XIA, HAO JIANG, University of Massachusetts Amherst, MA, USA

16.30 Break

Chair: Jinfeng KANG, China

17.00 FM-3:IL05 Design and CMOS Co-integration of ReRAM Devices and Crossbar Arrays for Neuromorphic Applications
Y. LEBEBIC, EPFL, Switzerland

17.30 FM-3:IL06 Specific Switching Algorithms for Emerging Applications of RRAM based Memories
E. PEREZ, M.K. MAHADEVAIYAH, Ch. WENGER, IHP, Frankfurt (Oder), Germany; C. ZAMBELLi, P. OLIVO, Università degli Studi di Ferrara, Ferrara, Italy; F.M. PUGLISI, P.PAWAN, Università di Modena e Reggio Emilia, Modena, Italy; M. ZIEGLER, H. KOHLSTEDT, Kiel University, Kiel, Germany

17.50 FM-3:IL07 Evolution of a-IGZO Thin-film Transistor Memory: From Incapability of Electrical Erase to Achievement of Multi-level Cell
SHI-JIN DING, School of Microelectronics, Fudan University, Shanghai, China
MONDAY JUNE 11 AFTERNOON

FN - 6th International Conference
NOVEL FUNCTIONAL CARBON
NANOMATERIALS

Room: ORVIETO B
Chair: Yury GOGOTSI, USA (Convener)

14.25 Welcome

Session FN-1 - Growth and Processing

14.30 FN-1:IL01 Light Scattering and Emission from Hetero-structures
A.C. FERRARI, Cambridge Graphene Centre, University of Cambridge, Cambridge, UK

15.00 FN-1:IL02 Highly Efficient Solar-fuel Photocatalysts for CO2 Reduction to Selective Hydrocarbons
KUEI-HSIEN CHEN¹, INDRAJIT SHOWN¹, LI-CHYONG CHEN²,
¹Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan; ²Centre for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan

15.30 FN-1:IL03 Preparation and Applications of Hybrid Graphene Hyrogels
E. VAZQUEZ, Instituto Regional de Investigación Científica Aplicada (IRICA), Universidad de Castilla-La Macha, Ciudad Real, Spain

16.00 Break

Chair: Morinobu ENDO, Japan

16.30 FN-1:IL05 Soft Processing (= Green Processing) for Nano Carbons: Direct Fabrication of Functionalized Graphenes and Their Hybrids Inks via Submerged Liquid Plasma [SLP] and Electrochemical Exfoliation [ECE] under Ambient Conditions
MASAHIRO YOSHIMURA, J. SENTHILNATHAN, K. SANJEEVARAO, E. SATHEESHKUMAR, Promotion Centre for Global Materials Research (PCGMR), Dept. of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan

17.00 FN-1:IL06 Graphene Exfoliation and Processing
A. CIESIELSKI, Institut de Science et d’Ingenierie Supramoléculaires (ISIS), Université de Strasbourg and CNRS, Strasbourg, France
MONDAY JUNE 11 AFTERNOON

FO - 8th International Conference
SCIENCE AND ENGINEERING OF NOVEL SUPERCONDUCTORS

Room: MONTEFALCO
Chair: Davor PAVUNA, Switzerland (Convener)

14.25 Welcome

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

14.30 FO-1:IL01 Why is Tc in Cuprates so high? I. BOZOVIC, Brookhaven National Laboratory, Upton, NY, USA; and Yale University, New Haven, CT, USA

15.00 FO-1:IL02 A Tale of Two Metals: Contrasting Criticalities in the Pnictides and Hole-doped Cuprates N.E. HUSSEY, J. BUHOT, S. LICCIARDELLI, High Field Magnet Laboratory (HFML-EMFL), Radboud University, Nijmegen, Netherlands

15.30 FO-1:IL03 High Tc Pairing in Size-selected Metal Nanoclusters V. KRESIN, P. EDWARDS, University of Southern California, Los Angeles, CA, USA; A. HALDER, Argonne National Laboratory, USA

16.00 Break

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

Chair: Vitaly KRESIN, USA

16.30 FO-2:IL01 Magnet Application of Iron-based Superconductors AKIYASU YAMAMOTO, Department of Applied Physics, Tokyo University of Agriculture and Technology, Tokyo, Japan; J. WEISS, Department of Physics, University of Colorado, Boulder, CO, USA; M. AINSLIE, Department of Engineering, University of Cambridge, UK; A. POLYANSKI, D. LARBALESTIER, E. HELSTROM, Applied Superconductivity Center, National High Magnetic Field Laboratory, Florida State University, USA

17.00 FO-2:IL02 Laser ARPES Study on High Temperature Superconductors XINGJIANG ZHOU, National Lab for Superconductivity, Institute of Physics, Chinese Academy of Sciences, Beijing, China

17.30 FO-2:IL03 Novel Effects in Multilayer Superconductor/Magnet Films C. BERNHARD, University of Fribourg, Department of Physics and Fribourg Center of Nanomaterials (FriMat), Fribourg, Switzerland
FP - 12th International Conference
MEDICAL APPLICATIONS OF ADVANCED BIOMATERIALS AND NANO-BIOTECHNOLOGY

Room: MAGIONE B

Chair: Thomas WEBSTER, USA (Convener)

14.25 Welcome

Session FP-1 - Advances in Biomaterials

14.30 FP-1:IL01 Advanced Bioactive Structures for Intervertebral Disc Repair/Regeneration
L. AMBROSIO, A. GLORIA, Institute of Polymers, Composites and Biomaterials, National Research Council, Naples, Italy

15.00 FP-1:IL02 Shape Memory Activated Polyelectrolyte Nano-wrinkles Improve Fibroblast Cell Attachment and Alignment
P.T. MATHER, Chemical Engineering, Bucknell University, Lewisburg, PA, USA; A. ASH-SHAKOOR, J.H. HENDERSON, Biomedical and Chemical Engineering, Syracuse University, USA

15.30 Break

Chair: Patrick T. MATHER, USA

16.00 FP-1:IL03 Development of a Fish Gelatin-based Soft Tissue Adhesive for Biomedical Applications
TETSUSHI TAGUCHI, RYO MIZUTA, Biomaterials Field, Research Center for Functional Materials, National Institute for Materials Science, Japan

16.30 FP-1:IL05 Cellular and Tissue Modulation via Exploiting Molecularly Movable Polyrotaxane Surfaces
NOBUHIKO YUI, J.-H. SEO, A. TAMURA, Y. ARISAKA, Tokyo Medical and Dental University, Tokyo, Japan; T. YAMAOKA, S. KAKINOKI, National Cerebral and Cardiovascular Center Research Institute, Osaka, Japan
**Room:** CORCIANO

**Session FA-1 - Materials and Fabrication Processes**

**Chair:** Craig ARMIENTO, USA

**9.00 FA-1/IL05** Polymeric Solid-state Ionic Gate Dielectrics for Low-voltage Field-effect Transistors

**YONG-YOUNG NOH**, Department of Energy and Materials Engineering, Dongguk University, Seoul, South Korea; **YONSEUK CHOI**, Department of Electronics, Hanbat National University, Daejeon, South Korea

**9.40 FA-1/L06** Self-organization of pi-extended Heteroacenes for Solution-processable Organic Field-effect Transistors

**TATSUYA MORI, T. YASUDA**, Kyushu University, Fukuoka, Japan

**10.10 FA-1/L07** Realizing Flexible High-performance Silver Interconnects on Thin and Ultrathin Substrates by Inkjet-printing and Innovative Laser Treatment

**M. VINNICHENKO**, D. MAKAROV', M. FRITSCH', T. VOITSEKHIVSKA', V. SAUCHUK', M. KUSNEZOFF', 'Fraunhofer IKTS, Dresden, Germany; 'Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

**10.40** Break

**Chair:** Vid BOBNAR, Slovenia

**Session FA-2 - Device Physics, Mechanics and Design**

**11.10 FA-2/IL06** Electronic and Thermoelectric Properties of High-performance Polymer Semiconductors and Conductors

**M. KEMERINK**, Complex Materials and Devices, Department of Physics, Chemistry and Biology (IFM), Linköping University, Sweden

**11.50 FA-2/L07** Organic Semiconducting Crystals as Flexible, Ultra-low Voltage, Ionizing Radiation Detectors

**B. FRABONI**, Department of Physics and Astronomy, University of Bologna, Bologna, Italy

**Session FA-3 - Applications of Flexible/Stretchable Electronics**

**12.30 FA-3/IL07** System Design for Flexible All-organic Reflectance Oximeter

**Y. KHAN, DONGGEON HAN, A. PIERRE, J. TING, XINGCHUN WANG, C.M. LOCHNER, A.C. ARIAS**, Dept. of Electrical Engineering and Computer Sciences, University of California, Berkeley, CA, USA
Room: ASSISI A

Chair: Magnus T. BORGSTROM, Sweden

Session FB-2 - III-V Solar Cells

9.00  FB-2:IL01  High Efficiency Multi-junction Solar Cells for Concentrator Photovoltaics  
G. TIMÒ, N. ARMANI, G. ABAGNALE, RSE, Piacenza, Italy

MASAKAZU SUGIYAMA, Research Center for Advanced Science and Technology (RCAST), The University of Tokyo, Japan

10.00 FB-2:IL03  Efficient Solar Cells and Water Reduction with Nanowires  

Session FB-5 - Excited State Enhanced Solar Cells

10.30  FB-5:IL01  Photothermoelectric Energy Harvesting and Light Detection in Heterostructure Nanowires  
H. LINKE, NanoLund, Lund University, Lund, Sweden

11.00  Break

Session FB-1 - Thin-film Photovoltaics

Chair: Bart VERMANG, Belgium

11.20  FB-1.2:IL05  Interfaces in CdTe Thin-film Solar Cells  
B.G. MENDIS, A.A. TAYLOR, Durham University, Durham, UK; J.D. MAJOR, K. DUROSE, University of Liverpool, UK

11.50  FB-1.2:IL06  Low-cost Thin Film Solar Cells for BIPV Applications  
E. GILIOlI, IMEM-CNR, Parma, Italy

12.20  FB-1.2:IL07  Electronic and Chemical Structure of Interfaces in CIGS and CdTe Thin-film Solar Cells  
C. HESKE, Institute for Photon Science and Synchrotron Radiation (IPS) and Institute for Chemical Technology and Polymer Chemistry (ITCP), Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany; Dept. of Chemistry and Biochemistry, University of Nevada, Las Vegas (UNLV), Las Vegas, NV, USA

12.50  FB-1.2:IL08  Optimization of Pulsed Laser Deposition Parameters for the Growth of High-quality Culn1-xGaxSe2 Thin Films  
CH. NICOLAOU1, A. ZACHARIA2, G. ITSKOS3, J. GIAPINTZAKIS4,  
1Dept. of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus; 2Experimental Condensed Matter Physics Lab, Department of Physics, University of Cyprus, Nicosia, Cyprus
Room: ASSISI B

Session FC-1 - Hydrogen Production

Chair: Ronald MICHALSKY, Switzerland

9.30  FC-1.2:IL02  Hybrid Materials for Photobiological Hydrogen Production  
      A. ANTONUCCI, N. SCHUERGERS, A.A. BOGHOSSIAN, Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland

10.00 FC-1.2:IL04  Water Oxidation Catalysts and a Turned Hydrogenase for Solar Hydrogen Production  
      S. STYRING, Molecular Biomimetics, Department of Chemistry, Angström, Uppsala University, Uppsala, Sweden

10.30 Break

Chair: Guido MUL, Netherlands

11.00 FC-1.1:IL04  Solar Redox Cycles for Splitting H2O and CO2: Status & Perspectives  
      R. MICHALSKY, A. STEINFELD, ETH Zürich, Department of Mechanical and Process Engineering, Zürich, Switzerland

11.30 FC-1.1:LO5  3D-printed Porous Ceria Structures for Solar Thermo-chemical Redox Splitting of H2O and CO2  
      S. ACKERMANN, M. HOES, D. THEILER, P. FURLE, A. STEINFELD, ETH Zurich, Department of Mechanical and Process Engineering, Zurich, Switzerland

11.50 FC-1.4:LO1  Methane Enriched Gas Produced via Co-electrolysis of H2O and CO2 with a Solid Oxide Cell Operating at Intermediate Temperatures  
      M. LO FARO, S. TROCINO, S.C. ZIGNANI, A.S. ARICO’, Institute of Advanced Energy Technologies (ITAE) of the Italian National Research Council (CNR), Messina, Italy
TUESDAY JUNE 12 MORNING

Room: NORCIA

Session FD-1 - Batteries

Chair: Teofilo ROJO, Spain

9.00 FD-1:IL06 Aluminum Batteries: Sustainable Alternative to Lithium-ion Systems
G.A. ELIA, Technische Universität Berlin, Research Center of Microperipheric Technologies, Berlin, Germany

9.40 FD-1:L07 High-nickel Layered Oxide Cathodes for Next-generation Lithium-ion Batteries
A. MANTHIRAM, Materials Science and Engineering Program and Texas Materials Institute, The University of Texas at Austin, Austin, TX, USA

10.10 FD-1:L08 High-temperature Reactivity of Li7La3Zr2O12-based Garnets with Cathode Active Materials
V. TARNOPOLSKII, O. HAJNDL, S. CHOMETTE, P. AZAIS, Commissariat à l’Énergie Atomique et aux Énergies Alternatives, Grenoble, France; M. CHAKIR, Renault, France

10.40 Break

Chair: Fermin CUEVAS, France

11.00 FD-1:IL09 Electrochemical Properties of Highly Concentrated Aqueous Na-ion Battery
SHIGETO OKADA, RYO SAKAMOTO, KOSUKE NAKAMOTO, AYUKO KITAJOU, DAIKI MURAKAMI, HARUKA HIRAI, MASARU TANAKA, Institute for Materials Chemistry and Engineering, Kyushu University, Kasuga, Fukuoka, Japan

11.40 FD-1:IL10 Layered Oxide Electrode Materials for Sodium-ion Batteries
C. DELMAS, J. YOSHIDA, B. MORTERMARD, L. VITOUX, M. GUIGNARD, D. CARLIER, ICMCB, Pessac France; J. YOSHIDA, Toyota Motor Europe NV/SA, Zaventem, Belgium

Session FD-2 - Supercapacitors

12.20 FD-2:IL04 Buffered Solutions as New Electrolytes for Aqueous Supercapacitors
WATARU SUGIMOTO, SHO MAKINO, DAI MOCHIZUKI, Shinshu University, Faculty of Textile Science and Technology, Ueda, Japan
Session FE-1 - Solid Oxide Fuel Cells (SOFCs)

Chair: Elisabeth DJURADO, France

9.00 FE-1:L06 Analysis of Microstructural Change of Electrodes during Discharge Operation of Solid Oxide Fuel Cells
KOICHI EGUCHI, HIROKI MUROYAMA, TOSHIAKI MATSUI, Department of Energy and Hydrocarbon Chemistry, Graduate School of Engineering, Kyoto University, Kyoto, Japan

9.30 FE-1:L09 Direct Utilisation of Dry Ethanol in Solid Oxide Fuel Cells Using a Perovskite Anode Modified with Ni-alloy @ FeOx Core-shell Nanoparticles
M. LO FARO, S.C. ZIGNANI, S. TROCINO, S. MAISANO, A.S. ARICO1, Institute of Advanced Energy Technologies (ITAE) - Italian National Research Council (CNR), Messina, Italy; R.M. REIS, G.G.A. SAGLIETTI, V. OLIVEIRA, E.A. TICIANELLI, Instituto de Quimica de Sao Carlos - USP, Brazil; N. HODNIK, F. RUIZ-ZEPEDA, National Institute of Chemistry - Ljubljana, Slovenia

10.00 FE-1:L10 Direct Addition of Lithium and Cobalt Oxide to Ce0.8Gd0.2O1.95 Electrolytes to Improve Microstructural and Electrochemical Properties in IT-SOFC at Lower Sintering Temperature
G. ACCARDO1, D. FRATTINI2, H.C. HAMC3, S.P. YOON3, 1Fuel Cell Research Center, Korea Institute of Science and Technology, Seoul, South Korea; 2Graduate school of Energy and Environment, Seoul National University of Science and Technology, South Korea

10.30 Break

Chair: Koichi EGUCHI, Japan

11.00 FE-1:L11 Study of Materials Based on La0.6Sr0.4Fe1-yCoyO3-x for Cathodes of Intermediate Temperature Solid Oxide Fuel Cells, (IT-SOFCs)
J. TARTAJ SALVADOR, Instituto de Cerámica y Vidrio (CSIC), Madrid, Spain

11.30 FE-1:L12 Bioethanol Fed Directly to Commercial Solid Oxide Fuel Cells
S. TROCINO1, S.C. ZIGNANI1, R.M. REIS2, G.G.A. SAGLIETTI2, V. OLIVEIRA2, E.A. TICIANELLI2, A.S. ARICO3, M. LO FARO4, 1Institute of Advanced Energy Technologies (ITAE) of the Italian National Research Council (CNR), Messina, Italy; 2Instituto de Quimica de Sao Carlos - USP, Brazil
TUESDAY JUNE 12 MORNING

Room: SALA RELATORI

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

Chair: Georg MADSEN, Austria

9.30 FF-1:IL05 Electric Power Generation from Waste Heat without Temperature Gradient
SHINJI MUNETOH, YUKI OSAKABE, OSAMU FURUKIMI, Kyushu University, Fukuoka, Japan

10.10 FF-1:IL06 Ab Initio Calculations as a Guiding Tool for the Study of Phase Stability of Thermoelectric Materials
D. FUKS, Y. GELBSTEIN, Materials Engineering Department, Ben Gurion University of the Negev, Beer Sheva, Israel

10.50 Break

Chair: Janusz TOBOLA, Poland

11.20 FF-1:IL07 Structuring Intuition with Theory: The High-throughput Way
M. FORNARI, Department of Physics and Science of Advanced Materials Program, Central Michigan University, Mount Pleasant, MI, USA

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

12.00 FF-2:IL02 Towards a Magnesium-silicide Based Thermoelectric Generator: Material and Contact Development for n- and p-type Magnesium Silicide Based Solid Solutions
J. DE BOOR1, H. KAMILA1, P. PONNUSAMY1, M. YASSERI1,2, A. SANKHLA1, N.H. PHAM1, N. FARAH1, E. MÜLLER1,2, Institute of Materials Research, German Aerospace Center, Köln, Germany, Institute of Inorganic and Analytical Chemistry, Justus Liebig University Giessen, Giessen, Germany
Session FG-1 - Hard Magnetic Materials

Chair: Yusuke HIRAYAMA, Japan

9.00 FG-1:IL07 Hard Magnetic Materials based on Nanowires
J. PING LIU, Department of Physics, University of Texas at Arlington, Arlington, TX, USA

9.30 FG-1:IL08 Recent Advances in Micro-magnetic Modelling of Permanent Magnets
T. SCHREFL, A. KOVACS, J. FISCHBACHER, M. GUSENBAUER, Danube University Krems, Wiener Neustadt, Austria

10.00 FG-1:IL09 Novel Developments in Hybrid Ferrite-based Hard Nano-materials
C. DE JULIAN FERNANDEZ, IMEM - CNR, Parma, Italy

10.30 Break

Chair: J. Ping LIU, USA

11.00 FG-1:IL10 New Processing of RE-based Magnetic Materials
S. KOBE, Jožef Stefan Institute, Ljubljana, Slovenia

11.30 FG-1:IL11 Study of Anisotropic Bonded Permanent Magnetic Materials
JINBO YANG, JINGZHI HAN, School of Physics, Peking University, Beijing, China

12.00 FG-1:IL12 Towards the Optimized Use of Permanent Magnets: Development of 3d Printed Magnets
D. SUESS1, C. HUBER1, S. SCHUSCHNIGG2, M. GRÖNEFELD3, 1Christian Doppler Laboratory for Advanced Magnetic Sensing and Materials, Faculty of Physics, University of Vienna, Vienna, Austria; 2Magnetfabrik Bonn GmbH, Bonn, Germany; 3Department of Polymer Engineering and Science, Montanuniversitaet Leoben, Leoben, Austria
Room: SALA STAMPA

Session FH-1 - Design Elements and Advanced Concepts for Photofunctional Materials

Chair: Csaba JANAKY, Hungary

9.00  FH-1:IL05 Mechanistic Aspects of Photocatalysis - Control of Photoinduced Redox Processes  
W. MACYK, M. KOBIELUSZ, M. TROCHOWSKI, M. SUROWKA, M. PACIA, J. KUNCEWICZ, Faculty of Chemistry, Jagiellonian University in Kraków, Kraków, Poland

9.40  FH-1:IL06 The Photochemical Reactivity of Polar Surface Domains on Non-polar Surfaces  
G.S. ROHRER, P.A. SALVADOR, Carnegie Mellon University, Dept. of Materials Science and Engineering, Pittsburgh, PA, USA

10.20 FH-1:IL07 Nano-graphitic Templates and Hierarchical Nanostructures in Multi-functional Electrocatalysts for the Artificial Leaf  
G. VALENTI, A. BONI, M. MARCACCI, S. RAPINO, M. IURLO, F. PAOLUCCI, University of Bologna, Bologna, Italy; P. FORNASIERO, M. PRATO, University of Trieste, Italy; M. BONCHIO, University of Padua, Italy

11.00 Break

Session FH-2 - Understanding Fundaments of Photo-induced Processes and Charge Transport

Chair: Jennifer STRUNK, Germany

11.20 FH-2:IL01 Atomic Level In situ Microscopy and Spectroscopy of Photocatalyst for Water Splitting  
D. HAIBER, Q. LIU, T. BOLAND, R. A. CROZIER, Arizona State University, Tempe, AZ, USA

12.00 FH-2:IL02 Role of Radical Species and Interparticle Electron Transfer in Photocatalysis  
D. BAHNEMANN, Institut fuer Technische Chemie, Gottfried Wilhelm Leibniz Universitaet Hannover, Hannover, Germany

12.40 FH-2:LO7 Electron Transfer and Energy Transfer in Heterogenous Photocatalysis  
F. PARRINO, L. PALMISANO, Dipartimento di Energia, Ingegneria dell’Informazione e Modelli Matematici (DEIM), Università degli Studi di Palermo, Palermo, Italy
Session FI-1 - Material Design and Processing

Chair: Ken-Tsung WONG, Taiwan

9.00 FI-1:IL05 Materials and Device Design for Improving the Stability of OLEDs
HIROHIKO FUKAGAWA1, YUKIKO IWASAKI1, TSUBASA SASAKI1, MUNEHIRO HASEGAWA2, KATSUYUKI MORII2, TAKAHIWA SHIMIZU2, 1Japan Broadcasting Corporation (NHK), Science & Technology Research Laboratories, Setagaya-ku, Tokyo, Japan; 2Nippon Shokubai Co., Ltd., Suita, Osaka, Japan

9.40 FI-1:IL06 Feasibility of Future GaN Large Area Light Emitting Devices
HIROSHI FUJIOKA, K. UENO, A. KOBAYASHI, Institute of Industrial Science, The University of Tokyo, Meguro-ku, Tokyo, Japan; ACCEL-JST, Chiyoda-ku, Tokyo, Japan

10.20 FI-1:LO7 Recent Progress and Challenges of InN and In-rich InGaN by RF-MBE
YASUSHI NAMISHI1, TOMOHIRO YAMAGUCHI2, TSUTOMU ARAKI2, 1Ritsumeikan University, Kusatsu, Shiga, Japan; 2Kogakuin University, Hachioji, Tokyo, Japan

10.50 Break

Chair: Takuma YASUDA, Japan

11.20 FI-1:IL08 New Blue Organic Emitters for OLED Lightings
JONGWOOK PARK, Department of Chemical Engineering, Kyung Hee University, Deogyeong, Gijeong, Yongin, Kyunggi, South Korea

12.00 FI-1:LO9 Transparent Spinel ceramics for White Light-Emitting Diodes Applications
M. RADWAN, J. SEDLACEK, Z. LENCES, P. SAJGALIK, Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava, Slovakia
Room: CASCIA

Session FJ-1 - Fundamentals

Chair: Ian POVEY, Ireland

9.30  FJ-1:IL06  Thio- and Seleno-cyanates: Theory and Applications for an Emerging Class of Multi-functional Materials
L. TSETSERIS, Department of Physics, National Technical University of Athens, Zografou Campus, Athens, Greece

10.10  FJ-1:IL08  Thermal Transport in Transparent Conductive Oxide Films
NOBUTO OKA¹, Y. SHIGESATO², ¹Kindai University, Iizuka, Fukuoka, Japan; ²Aoyama Gakuin University, Sagamihara, Kanagawa, Japan

10.50  Break

Chair: Nobuto OKA, Japan

11.20  FJ-1:IL09  First-principles Modeling of Complex Oxide Interfaces
C.G. VAN DE WALLE, Materials Department, University of California, Santa Barbara, CA, USA; A. JANOTTI, University of Delaware, Newark, DE, USA

12.00  FJ-1:IL10  Ab Initio Design of P-type Transparent Conductors: From Oxides to Oxide Chalcogenides
G. TRIMARCHI, Department of Chemistry, Northwestern University, Evanston, IL, USA
Room: SPOLETO B

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

Chair: Thak Sang BYUN, USA

9.00 FK-1:IL04 Tungsten Powder Injection Molding @ KIT: Achievements and Trends
S. ANTUSCH, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

9.30 FK-1:IL05 The Theory of Precipitation Hardening Revisited: The Effect of Crystal Structure on the Obstacle Strength
YOSHITAKA MATSUKAWA, Tohoku University, Sendai, Japan

10.00 FK-1:L06 Improvement of Density and Strength of CVI-processed SiC/Si Composites by Applying SiN Nanowires
DAEJONG KIM, HO WOOK LEE, SEUNGHO LEE, HYEON-GEUN LEE, JI YEON PARK, WOE-NJU KIM, Korea Atomic Energy Research Institute, Daejeon, South Korea

10.20 FK-1:L07 Development of the Nanostructured Ferritic Alloy OFRAC (Fe-12Cr-MoTiNb) for Fast Reactor Advanced Fuel Cladding
D.T. HOELZER, C.P. MASSEY, K.A. TERRANI, Oak Ridge National Laboratory, Oak Ridge, TN, USA

10.40 FK-1:L08 Microstructural Evolution of Oxide Dispersion Strengthened Alloys under Temperature and Stress
JINSUNG JANG, TAE KYU KIM, WOO GON KIM, CHANG HEE HAN, Korea Atomic Energy Research Institute, South Korea; XIAODONG MAO, Institute of Nuclear Energy Safety Technology, CAS, China; MAN WANG, HEUNG NAM HAN, Seoul National University, South Korea

11.00 Break

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

Chair: Steffen ANTUSCH, Germany

11.20 FK-2:IL01 Hydrogen Isotope Retention in Low-activation Structural Materials
A.V. SPITSYN, N.P. BOBYR, A.V. GOLUBEVA, NRC Kurchatov Institute, Moscow, Russia; V.M. CHERNOV, VNIIM, Moscow; Russia

11.50 FK-2:L02 Expanding the Operation Window of RAFM Steels by Optimized Chemical Compositions and Heat Treatments
J. HOFFMANN, M. RIETH, M. KLIMENKOV, S. BAUMGÄRTNER, Karlsruhe Institute of Technology, Karlsruhe, Germany

12.20 FK-2:L03 Sputter-erosion of Low-activation Steel
M. OBERKOFLER*, R. ARREDONDO PARRA*, M. BALDENI, S. ELGETI, H. GREUENER, W. JACOB, M. MAYER, R. NEU, T. SCHWARZ-SLINGER, T.F. SILVA, KAZUYOSHI SUGIYAMA, U. VON TOUSSAINT, Max Planck Institute for Plasma Physics, Garching, Germany; Instituto de Física da Universidade de São Paulo, São Paulo, Brazil

V. KASCHEEV, High-Tech Institute of Inorganic Materials, Moscow, Russia
Focused Session FK-10
MATERIALS ISSUES IN NUCLEAR WASTE TREATMENT AND DISPOSAL

Room: VIP
Chair: Kevin FOX, USA (Convener)

9.25 Welcome

Session FK-10.1 - Waste Form Development

9.30 FK-10.1:IL01 Recent Advances in the Immobilization of Low- or Intermediate-level Radioactive Waste in Cementitious Materials
C. CAU DIT COUMES, J.B. CHAMPENOIS, A. POULESQUEN, D. LAMBERTIN, CEA, DEN, DE2D, SEAD, Bagnols-sur-Cèze, France

10.00 FK-10.1:IL02 Phosphate-based Glasses and Glass Ceramics for Immobilization of Lanthanides and Actinides
S.V. STEFANOVSKY, O.I. STEFANOVSKY, Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, Russia; S.E. VINOKUROV, Vernadsky Institute of Geochemistry and Analytical Chemistry RAS, Russia

10.30 FK-10.1:L03 Synthesis and Thermal Behavior of Thorium-incorporated Rhabdophane
DANWEN QIN, A. MESBAH, S. SZENKNECT, N. CLAVIER, N. DACHEUX, Institut de Chimie Séparative de Marcoule, Bagnols sur Cèze Cedex, France

10.50 Break

Chair: Sergey STEFANOVSKY, Russia

11.20 FK-10.1:L04 Immobilization of Fission Products in Glass and Glass Ceramic Matrices
S. SCHULLER, E. REGNIER, J. FOURNIER-RENAUD, H. PABLO, CEA, DEN, DE2D, SEVT, Bagnols-sur-Cèze, France

11.50 FK-10.1:L06 Thorium Incorporation in the Xenotite Based Ceramic
A. MESBAH1, N. CLAVIER1, S. SZENKNECT1, J. LOZANO-RODRIGUEZ2, N. DACHEUX1, 1ICSM, UMR 5257 CNRS - CEA - ENSCM - Université de Montpellier, Site de Marcoule - Bat 426, Bagnols/Cèze, France; 2HZDR, Institute of Resource Ecology, the Rossendorf Beamline at ESRF, Grenoble, France
Room: MAGIONE A

Session FL-1 - Classes of Materials and their Synthesis and Chemical Modification

Chair: Guglielmo LANZANI, Italy

9.30  FL-1:IL05  Synthesis and Characterization of Micro- and Nano-structured Surfaces for Controlling Selective Cell Response
C. AKTAS, AYMAN HAIDAR, MICHAEL VEITH, FRANZ FAUPEL, HASHIM ABDUL-KHALIQ, Kiel, Germany

10.10 FL-1:IL06  Photosynthetic Enzymes as Photoactive Soft Materials
F. MILANO, S. LA GATTA, A. AGOSTIANO, M. DELL’EDERA, R. RAGNI, G.M. FARINOLA, M. TROTTO. Istituto per i Processi Chimico Fisici - CNR - Bari; Dipartimento di Chimica, Università di Bari, Bari, Italy

10.50  Break

Chair: Emilio PARISINI, Italy

11.20  FL-1:L07  Investigation of Leaf Shape and Edge Design for Faster Evaporation in Biomimetic Heat Dissipation Systems
P. GRUBER, A. RUPP, University of Akron, Biomimicry Research and Innovation Center BRIC, Akron, OH, USA

11.50  FL-1:L08  Polymer Brushes Grafted into Supported Porous Oxide Films Generating 3-D Non-fouling Surfaces
M. ES-SOUNI, Institute for Materials & Surface Technology, Kiel University of Applied Sciences, Kiel, Germany
Room: ORVIETO A

Session FM-1 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

Chair: Stefano BRIVIO, Italy

9.00 FM-1:IL01 NVM Technologies Based on Ferroelectric Hafnium Oxide

T. MIKOLAJICK1,2, T. SCHENK1, T. MITTMANN1, M. HOFFMANN1, B.MAX2, C. RICHTER2, M. PESIC3, F. FENGLER1, H. MULAOSMANOVIC1, M.-H. PARK1, S. SLESAZECKI1, U. SCHROEDER1, J. MULLER1, P. POLAKOWSKI1, S. MULLER2, R. MATERLIK3, A. KERSCH1. 1NaMLab gGmbH, Dresden, Germany; 2Chair of Nanoelectronic Materials, TU Dresden, Dresden, Germany; 3Fraunhofer IPMS-CNT, Dresden, Germany; 4FMC GmbH, Dresden, Germany; 5Munich University of Applied Sciences, Munich, Germany

Session FM-3 - Emerging Applications for Non-volatile Memories

9.30 FM-3:IL08 Spintronics Memories for Bio-inspired Computing

D. QUERLIOZ, A. MIZRAHI, D. VODENICAREVIC, T. HIRTZLIN, J.S. FRIEDMAN, N. LOCATELLI, J. GROLLIER, University Paris-Sud, Orsay, France

10.00 FM-3:L12 Emerging Applications for Electroforming-free Perovskite Memristors

H. SCHMIDT1,2,3,5, NAN DU1, D. BÜRGER1,4, I. SKORUPA1, R. ECKE1, S.E. SCHULZ2, 1Materials systems for Nanoelectronics, Chemnitz University of Technology, Chemnitz, Germany; 2Faculty of Physics, Friedrich-Schiller University of Jena, Jena, Germany; 3Leibniz-Institut für Photonische Technologien e.V. (IPHT), Jena, Germany; 4Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, Dresden, Germany; 5Fraunhofer-Institut für Elektronische Nanosysteme, Abteilung Back-End of Line, Chemnitz, Germany

10.20 Break

Chair: Damien QUERLIOZ, France

10.50 FM-3:L09 Spintronic Analog Memory for Neuromorphic Computing

SHUNSUKE FUKAMI1,2,3,4, W.A. BORDERS1, A. KURENKOV1, C. ZHANG1,2, S. DUTTAGUPTA1,2, H. OHNO1,2,3,4, 1Laboratory for Nanoelectronics and Spintronics, RIEC, Tohoku University, Japan; 2Center for Spintronics Integrated Systems, Tohoku University, Japan; 3Center for Innovative Integrated Electronic Systems, Tohoku University, Japan; 4Center for Spintronics Research Network, Tohoku University, Japan; 5WPi-Advanced Institute for Materials Research, Tohoku University, Japan

11.20 FM-3:L10 Understanding Organic Spintronic Devices and their Applications to Neuromorphic Computing

A. RIMINUCCI1, ZHI-GANG YU2, M. CALBUCCI1, R. CECCHINI1, P. GRAZIOSI1, M. PREZIOSO1, I. BERGENTI1, A. DEDIU1, 1Institute for the Study of Nanostructured Materials, CNR, Bologna, Italy; 2ISP/ Applied Sciences Laboratory, Washington State University, Spokane, WA, USA; 3Department of Electrical and Computer Engineering, University of California at Santa Barbara, Santa Barbara, CA, USA

11.40 FM-3:L16 A RRAM-based Self-organizing Neural Network

M. PEDRO1, J. MARTIN-MARTINEZ, R. RODRIGUEZ, M. NAFRIA, Departament d’Enginyeria Electrònica, Universitat Autonoma de Barcelona (UAB), Cerdanyola del Valles, Barcelona, Spain
Room: ORVIETO B

Session FN-1 - Growth and Processing

Chair: Ester VAZQUEZ, Spain

9.30  FN-1:IL07  Controlled Growth of High-quality Graphene and Various 2D Materials for Enhancing their Applications
HIROKI AGO, Global Innovation Center (GIC), Kyushu University, Fukuoka, Japan and National Institute for Advanced Science and Technology (AIST), Tsukuba, Japan

10.00 FN-1:IL08  Biomimetic On-surface Growth of Graphene Nanoribbons
HIROSHI SAKAGUCHI, Institute of Advanced Energy, Kyoto University, Kyoto, Japan

10.30 FN-1:IL09  Towards the Intrinsic Mobility limit of CVD Grown Graphene
C. STAMPFER, JARA-FIT and 2nd Institute of Physics, RWTH Aachen University, Germany

11.00  Break

Chair: Hiroshi SAKAGUCHI, Japan

11.30 FN-1:IL12  Epitaxial Graphene on SiC - Status and Prospects
R. YAKIMOVA, I. SHTEPLIUK, M. VAGIN, I.G. IVANOV, T. IAKIMOV, G.R. YAZDI, J. ERIKSSON, Linkoping University, IFM, Linkoping, Sweden

12.00 FN-1:IL13  Integrated Synthesis of Nitrogen and Sulfur Co-doped Carbon Spheres from Melamine and Biaminobenzenesulfonic Acid as Superior Catalyst for Selective Oxidation of Aromatic Alkanes
RONGWEN LYU, M.H. LIU, Dalian University of Technology, Dalian, Liaoning, China

12.20 FN-1:IL15  New Approaches for Preparation of Graphene-based Structures with the Intended Chemical Composition from Graphene Oxide
M.K. RABCHINSKII, A.T. IDEIKIN, M.V. BAIADKOVA, V.V. SHNITOV, D.A. KIRILENKO, S.V. KONIAKHIN, A. YA. VUL”, Ioffe Institute, St.Petersburg, Russia; F. Roth, TU Bergakademie, Freiberg, Germany
Session FO-1 - Materials, Structure, Physical Chemistry and General Properties

Chair: Dario Daghero, Italy

9.00 FO-1:IL04 Superconductor / Ferromagnet Films and Superconducting Spintronics
M.G. Blamire, Department of Materials Science, University of Cambridge, Cambridge, UK

9.30 FO-1:IL05 Phenomenological Interpretations of DFT Calculations for Superconductors
J.A. Alamdar, P.C. Talbot, I.D.R. Mackinnon, Institute for Future Environments, and Science and Engineering Faculty, Queensland University of Technology, Brisbane, Queensland, Australia

9.50 FO-1:IL06 New Process for Growing the HgBa2Ca2Cu3O8+δ Superconductors with the Highest Critical Temperature at Ambient Pressure
B. Lotret, A. Forget, J.-B. Moussy, D. Colson, SPEC, CEA, CNRS-UMR 3680, Université Paris-Saclay, Gif sur Yvette Cedex, France; S. Poissonnet, P. Bonnaille, SRMP, DMN, CEA, Université Paris-Saclay, Gif sur Yvette Cedex, France; G. Collin, LPS, CNRS-UMR 8502, Université Paris-Sud, Orsay, France; P. Thuery, NIMBE, CEA, CNRS, Université Paris-Saclay, Gif sur Yvette Cedex, France; B. Lotret, A. Sacuto, Laboratoire Matériaux et Phénomènes Quantiques, Paris Cedex, France

10.10 Break

Session FO-3 - Properties of Superconductors

Chair: Jinho Lee, South Korea

10.40 FO-3:IL01 Towards Atomic-scale Andreev Reflection
John Y.T. Wei, University of Toronto & Canadian Institute for Advanced Research, Toronto, Canada

11.10 FO-3:IL02 What do we Really Understand in all Novel High-Tc Superconductors: Orbitals in Three Dimensions
D.K. Sunko, Department of Physics, Faculty of Science, University of Zagreb, Zagreb, Croatia

11.40 FO-3:IL03 Collapse of High-Tc Superconductivity via Ultrafast Quenching of the Phase Coherence
F. Boschini, E. Razzoli, E.H. Da Silva Neto, M. Zonno, G. Levy, G.G. Gui, D.J. Jones, G. Giannetti, A. Damascelli, Quantum Matter Institute, University of British Columbia, Vancouver, Canada; UC Davis, Davis, USA; Brookhaven National Laboratory, Upton, USA; Università Cattolica del Sacro Cuore, Brescia, Italy

12.10 FO-3:IL04 Analyzing Supercurrents with x-ray Eyes
J. Albrecht, Research Institute for Innovative Surfaces FINO, Aalen University, Germany; J. SIMMENDINGER, S. RUOSS, G Schütz, MPI for Intelligent Systems, Stuttgart, Germany
Room: MAGIONE B

Session FP-1 - Advances in Biomaterials

Chair: James HENDERSON, USA

9.30 FP-1:IL06 Development of Novel Antibacterial Nanoparticles Suitable for Coating on Intravascular Catheters
TSUTOMU FURUZONO, Department of Biomedical Engineering, Faculty of Biology-Oriented Science and Technology, Kindai University, Kinokawa, Japan

10.00 FP-1:IL07 Implementing Multifunctionality in Polymer-based Biomaterials
A. LENDLEIN 1,2, Institute of Biomaterial Science and Berlin-Brandenburg Centre for Regenerative Therapies, Helmholtz-Zentrum Geesthacht, Teltow, Germany; 1University of Potsdam, Potsdam, Germany

10.30 FP-1:IL08 Design of Adhesive Growth Factors
YOSHIHIRO ITO, Nano Medical Engineering Laboratory, RIKEN, Japan Emergent Bioengineering Materials Research Team, RIKEN Center for Emergent Matter Science, Japan

11.00 Break

Chair: Andreas LENDLEIN, Germany

11.30 FP-1:IL09 Next Generation Nanofiber Structures for Regenerative Engineering
N. NAGIAH, L.S. NAIR, C. LAURENCIN, M. BHATTACHARJEE, The Institute for Regenerative Engineering, University of Connecticut Health Center, University of Connecticut, Farmington, CT, USA

Session FP-2 - Tissue Engineering and Regenerative Medicine

11.50 FP-2:IL02 Guided Bone/Tendon Regeneration by Growth Factor-Immobilized Asymmetrically Porous Membranes
JIN HO LEE, Hannam University, Daejeon, South Korea
Session FA-1 - Materials and Fabrication Processes

Chair: Rylie GREEN, UK

14.30 FA-1:IL11 Rehealable and Recyclable Artificial e-skin
JIANLIANG XIAO, Department of Mechanical Engineering, University of Colorado Boulder, CO, USA

15.10 FA-1:IL12 Freestanding Ultrathin and Ultraconformable PVF Capacitors
J. BARSOTTI, The Biorobotics Institute, Scuola Superiore Sant’Anna & Center for Micro-BioRobotics @SSSA, Istituto Italiano di Tecnologia, Pontedera, Italy; I. HIRATA*, M. CAIRONI, Center for Nano Science and Technology @Polimi, Istituto Italiano di Tecnologia, Milano, Italy; F. GRECO**, V. MATTOLI, Center for Micro-BioRobotics @SSSA, Istituto Italiano di Tecnologia, Pontedera, Italy; *At present at Center for Micro-BioRobotics @SSSA, Istituto Italiano di Tecnologia, Pontedera, Italy; **At present at Institute of Solid State Physics, Graz University of Technology, Graz, Austria

15.40 FA-1:IL13 Thin Functional Dielectric Elastomer for Stretchable Devices
D.M. OPRIS1, S.J. DünKi1, 2, YEE SONG KO1, 2, E. PERJU1, 2, P. CASPARI1, 2, D. DAMJANOVIC2, Y SHEIMA1, F.A. NÜESCH1, 2, 1Swiss Federal Laboratories for Materials Science and Technology Empa, Duebendorf; 2Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland; *"Petru Poni" Institute of Macromolecular Chemistry of Romanian Academy, Romania

16.10 Break

Session FA-2 - Device Physics, Mechanics and Design

Chair: Jonathan REEDER, USA

16.40 FA-2:IL01 Mechanical Properties of Organic Semiconductors for Stretchable and Mechanically Robust Electronics
D.J. LIPOMI, Department of NanoEngineering, University of California, San Diego, La Jolla, CA, USA

17.20 FA-2:IL02 Mechanical Reliability of Advanced Thin Films
TAEK-SOO KIM, Department of Mechanical Engineering, KAIST, Daejeon, South Korea
Room: ASSISI A

Session FB-1 - Thin-film Photovoltaics

Chair: Kenji YOSHINO, Japan

14.30   FB-1.3:IL01  Development of ZnSnP2 Solar Cells: A Novel Absorber Material  
YOSHITARO NOSE, SHIGERU NAKATSUKA, Kyoto University, Kyoto, Japan, SHUNSUKE AKARI, JAKAPAN CHANTANA, TAKASHI MINEMOTO, Ritsumeikan University, Japan

15.00   FB-1.3:IL02  Development of Antimony Selenide Solar Cells by a Scalable Deposition Route  
L.J. PHILLIPS1, P.J. YATES1, H. SHIEL1, O.S. HUTTER1, M. BIRKETT1, S. MARIOTTI1, C. SAVORY1, K. DUROSE1, D.O. SCANLON2, T.D. VEAL1, J.D. MAJOR1, 1Department of Physics, University of Liverpool, UK; 2Department of Chemistry, University College London, UK

15.30   FB-1.3:IL03  Kesterite Thin Tilm Solar Cells Prepared by Chemical Route  
SHIGERU IKEDA1, THI HIEP NGUEN2, TAKASHI HARADA2, 1Department of Chemistry, Konan University, Kobe, Japan, 2Research Center of Solar Energy Chemistry, Osaka University, Toyonaka, Japan

16.00   FB-1.3:IL04  Silicon Heterojunction with Organic Thin Layer (HOT) Solar Cells  
HAIJME SHIRAI, RYO ISHIKAWA, TAKUYA MIURA, Saitama University, Saitama, Japan

16.20   Break

Session FB-3 - Organic, Dye Sensitised and Nanoparticle Photovoltaics

Chair: Budhika MENDIS, UK

16.50   FB-3:IL01  Design of Molecular Donor and Acceptor Materials for Organic Solar Cells  
P. BLANCHARD, MOLTECH-Anjou, UMR CNRS 6200, University of Angers, Angers, France

17.20   FB-3:IL03  Improve the Photo-stability by Controlling the Chemical Structures of Photoactive Materials for Polymer Solar Cells  
VU VAN DOAN1,2, QUOC VIET HOANG1,2, RASOOL SHAFAKET1,2, CHANG EUN SONG1,2, WON SUK SHIN1,2, 1Energy Materials Research Center, Advanced Materials Division, Korea Research Institute of Chemical Technology (KRICT), Daejeon, South Korea; 2Department of Advanced Materials and Chemical Engineering, University of Science and Technology (UST), Daejeon, South Korea
Room: **ASSISI B**

**Session FC-2 - Hydrogen Storage**

**Chair:** Andrea BALDI, Netherlands

14.30 **FC-2.6:IL01** Proton Transfer through the Bulk and Near Surface Catalysis in Nickel Oxides  
M. CASPARY TOROKER, Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Technion City, Israel

15.00 **FC-2.6:L02** Theoretical Analysis of Alkali Metal and Magnesium Closo-Boranes  
A.E. MANIADAKI, Z. LODZIANA, Institute of Nuclear Physics - PAS, Kraków, Poland

15.20 Break

**Chair:** Michel LATROCHE, France

15.50 **FC-2.1:IL01** Metallic Nanoparticles in Hydrogen Storage and Conversion  
N. PATELLI, M. CALIZZI, L. PASQUINI, Department of Physics and Astronomy, University of Bologna, Bologna, Italy; Present address: Institut des Sciences et Ingénierie Chimiques, EPFL, Lausanne, Switzerland

16.20 **FC-2.1:IL02** Hydrogen Storage in Individual Nanoparticles  
A. BALDI, DIFFER - Dutch Institute for Fundamental Energy Research, Eindhoven, Netherlands
Room: NORCIA

Session FD-1 - Batteries

Chair: Steve G. GREENBAUM, USA

P. BARPANDA, Indian Institute of Science, Bangalore, India

15.10  FD-1:IL15  Singlet Oxygen in Non-aqueous Battery Chemistries  
N. MAHNE, L. SCHAFZAHL, E. MOUAD, Y. PETIT, B. SCHAFZAHL,  
C. SLUGOVC, S. BORISOV, S.A. FREUNBERGER, Graz University  
of Technology, Graz, Austria; O. FONTAINE, University of Montpellier,  
France; D. KRAMER, University of Southampton, UK

15.50  Break

16.20  FD-1:IL21  Ionic Liquid-based Electrolytes for Safe Lithium-ion Batteries  
A. MORETTI, S. PASSERINI, Helmholtz Institute Ulm, Karlsruhe  
Institute of Technology, Ulm, Germany
Room: SPELLO

Chair: K. Andreas FRIEDRICH, Germany

Session FE-1 - Solid Oxide Fuel Cells (SOFCs)

14.30 FE-1:L14 Robust Nano-particles on Active Perovskite Oxide Anode for Solid Oxide Electrochemical Cells
TAE HO SHIN, HANBIT KIM, Korea Institute of Ceramic Engineering & Technology, Jinju-si, South Korea

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

15.10 FE-2:IL01 Anion Exchange Membranes, Stable in Hot Caustic Solutions
S. HOLDCROFT, Department of Chemistry, Simon Fraser University, Burnaby, Greater Vancouver, BC, Canada

15.50 Break

16.20 FE-2:IL02 Mößbauer Spectroscopy in Fuel Cell Electrocatalysis of Non-precious Metal Catalysts
U.I. KRAMM, TU Darmstadt, Catalysts and Electrochemists, Darmstadt, Germany
TUESDAY JUNE 12 AFTERNOON

Room: SALA RELATORI

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

Chair: Johannes DE BOOR, Germany

14.30 FF-2:IL04 Thermoelectric Properties in Dirac/Weyl Semimetals
QIANG LI, Condensed Matter Physics & Materials Science Department, Brookhaven National Laboratory, Upton, New York, USA

15.10 FF-2:IL09 Thermal Conductivity over Engineered Inorganic-organic Interfaces
M. KARPPINEN, Aalto University, Department of Chemistry and Materials Science, Espoo, Finland

15.50 Break

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

Chair: David FUKS, Israel

16.20 FF-1:IL08 Ab Initio Calculations of the Thermal Conductivity, Discovery of New Materials, and Multi-scale Modeling
L. CHAPUT, LEMTA, CNRS UMR-7563, Univ. Lorraine, Vandoeuvre les Nancy, France

17.00 FF-1:L10 Advanced Protective Layers for Improved Chemical Stability and Corrosion Resistance in CoSb3 and Mg2Si Based Materials - Experimental and Theoretical Aspects
A. KOLEZYSKII, J. LESZCZYNSKI, P. NIERODA, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland

17.30 FF-1:IL09 Thermal Transport and Chemical Bonding in Clathrates
Y. GRIN, Max-Planck-Institut für Chemische Physik fester Stoffe, Dresden, Germany
Room: SPOLETO A

Session FG-2 - Soft Magnetic Materials

Chair: Eva M. PELLICER, Spain

14.30 FG-2/IL02 Magnetic Sensors and Actuators Based on Soft Magnetic Materials
C. GOMEZ-POLO, I. ROYO-SILVESTRE, J.M. JIMENEZ-RUIZ, J.J. BEATO-LOPEZ, Physics Departament & Institute for Advanced Materials (INAMAT), Universidad Pública de Navarra, Pamplona, Spain

15.00 FG-2/IL03 Engineering of Soft Magnetic Properties of Amorphous and Nanocrystalline Magnetic Microwires for Sensor Applications
A. ZHUKOV1,2,3, M. IPATOVI1,2, A. TALAAT1,2, J.M. BLANCO2, M. CHURYUKANOVA4, V. ZHUKOVA1,2, 1Dept. Phys. Mater., University of Basque Country, UPV/EHU San Sebastián, Spain; 2Dpto. de Física Aplicada, EUPDS, UPV/EHU, San Sebastian, Spain; 3IKERBASQUE, Basque Foundation for Science, Bilbao, Spain; 4National University of Science and Technology «MISIS», Moscow, Russia

15.30 FG-2/IL04 Effect of Stress Components on Magnetostatic and Magnetostrictive Properties of Amorphous Microwires
V. RODIONOVA1,2, K. CHICHAY1, I. BARABAN1, A. LITVINOVA1, 1STP “Fabrika” and Center for Functionalized Magnetic Materials (FunMagMa), Immanuel Kant Baltic Federal University, Kaliningrad, Russia; 2National University of Science and Technology «MISIS», Moscow, Russia
Session FH-1 - Design Elements and Advanced Concepts for Photofunctional Materials

Chair: Bunsho OHTANI, Japan

14.30 FH-1:L08 Advanced Organic/Inorganic Hybrid Materials Derived from Tunable Si-based NanoBuilding Blocks
S. DIRE, E. CALLONE, M. D’ARIENZO, B. DI CREDICO, R. SCOTTI, F. RIBOT, University of Trento, Dept. Industrial Engineering, Trento, Italy; University of Milano-Bicocca, Dept. Materials Science, Milano, Italy; Université Pierre et Marie Curie, CMCP, UMR7574 -UPMC / CNRS / Collège de France, Paris, France

15.10 FH-1:L09 Transient Behavior of Ni/NiO Modified Mg: SrTiO3 in Photocatalytic Overall Water Splitting
KAI HAN, B. MEI, G. MUL, University of Twente, Enschede, The Netherlands

15.40 FH-1:L10 Coupling Between Enzymes and a Photoactive Sulphide for Photoproduction of H2 and O2

16.10 Break

Session FH-2 - Understanding Fundaments of Photo-induced Processes and Charge Transport

Chair: Peter CROZIER, USA

16.40 FH-2:L03 Enhancing Photoelectrochemical Water Splitting Performance using Hematite Anode through Doping and Morphology Control
XIN ZHAO, ZHONG CHEN, School of Materials Science and Engineering, Nanyang Technological University, Singapore

17.20 FH-2:L04 Mechanistic Aspects of Photocatalytic CO2 Reduction
M. DILLA, A. MATEBLOWSKI, S. RISTIG, Max-Planck-Institute for Chemical Energy Conversion, Muelheim/Ruhr, Germany; N. MOUSTAKAS, T. PEPPEL, J. STRUNK, Leibniz Institute for Catalysis (LIKAT), Rostock, Germany
Room: BEVAGNA

Session FI-1 - Materials Design and Processing

Chair: Hirohiko FUKAGAWA, Japan

14.30 FI-1:IL10  Enhanced Performance of Luminescent Powders due to Coating of Phosphor Particles by Atomic Layer Deposition in a Fluidized Bed Reactor
H.T. HINTZEN1, O.M. TEN KATE2, Y. ZHAO3, L.J. YIN4, Z. ZHOU4, J.R. VAN OMMEN2, 1Luminescent Materials, Faculty of Applied Sciences, Delft University of Technology, Delft, The Netherlands; 2Product & Process Engineering, Faculty of Applied Sciences, Delft University of Technology, Delft, The Netherlands; 3College of Materials, Xiamen University, Xiamen, China; 4School of Energy Science and Engineering, University of Electronic Science and Technology of China, Chengdu, China; 5Science College of Hunan Agricultural University, Changsha, China

15.10 FI-1:IL11  Single-phased Eu2+–activated Phosphors with High Color Rendering for Near-UV LED Chips
PENG PENG DAI1, XINTONG ZHANG1, YICHUN LIU1, XIAOJUN WANG1, 1Key Laboratory for UV Light-Emitting Materials and Technology of Ministry of Education, northeast normal University, Changchun, China; 2Department of Physics, Georgia Southern University, Statesboro, GA, USA

15.50 FI-1:IL13  Design Strategies for Materials Showing Thermally Activated Delayed Fluorescence and Beyond - Towards the Fourth Generation OLED Mechanism
H. YERSIN, University of Regensburg, Regensburg, Germany
Room: CASCIA

Chair: Yaroslav ROMANYUK, Switzerland

Session FJ-2 - Material Design and Device Development

14.30  
FJ-2:IL01  Amorphous Semiconductor Mobility Physics  
J.F. WAGER, School of EECS, Oregon State University, Corvallis, OR, USA

15.10  
FJ-2:IL02  High-throughput Development of Wide Bandgap Conductive Sulfides  
A. ZAKUTAYEV, National Renewable Energy Laboratory, Golden, CO, USA

15.50  Break

Chair: Junjun JIA, Japan

16.20  
FJ-2:L03  Low-dimensional Multi-layer Metal Oxide Semiconductors for Transistor Applications  
T. ANTHOPOULOS, King Abdullah University of Science and Technology (KAUST), Division of Physical Sciences and Engineering, Thuwal, Saudi Arabia

Session FJ-3 - Applications

16.50  
FJ-3:IL04  Wide Band Gap ZnO Applications  
TETSUYA YAMAMOTO, Materials Design Center, Research Institute, Kochi University of Technology, Kami-shi, Kochi, Japan
Session FK-3 - Materials for First Wall Components of Nuclear Fusion Systems

Chair: Rudolf NEU, Germany

14.30 FK-3:IL03 Tungsten Alloys for Reduced Oxidation under Accident Conditions in Fusion C. GARCIA-ROSALÉS, A. CALVO, N. ORDÁS, I. ITURRIZA, Cet-Ik4 and Tecnun (Univ. of Navarra), San Sebastian, Spain; K. SCHLÜTER, R. NEU, M. BALDEN, H. GREUNER, Max-Planck-Institut für Plasmaphysik, Garching, Germany; K. SCHLÜTER, R. NEU, Technische Univ. München, Garching, Germany; F. KLEIN, G. PINTSUK, A. LITNOVSKÝ, T. WEGENER, Forschungsz. Jülich GmbH, Inst. f. Energie- und Klimaforschung - Plasmaphysik, Jülich, Germany; E. TEJADO, J. Y. PASTOR, Polytechnic Univ. of Madrid, Madrid, Spain

15.00 FK-3:IL04 Conclusions drawn from Plasma Operation with Beryllium and Tungsten Plasma-facing Components in JET and Linear Plasma Devices S. BREZINSEK¹, D. BORODIN¹, M. RUBEL², R. DOERNER² and PFC and JET contributors, ¹Forschungszentrum Jülich GmbH, Instit. für Energie- und Klimaforschung - Plasmaphysik, Jülich, Germany; ²Fusion Plasma Physics, Royal Institute of Technology (KTH), Stockholm, Sweden; ³Center for Energy Research, University of California at San Diego, La Jolla, CA, USA

15.30 FK-3:IL05 Overview of a Comprehensive First Mirror Test in the JET Tokamak for ITER M. RUBEL¹, S. SUNWOO MOON¹, P. PETERSSON¹, A. WIDDOWSON² and JET Contributors, ¹Royal Institute of Technology (KTH), Stockholm, Sweden; ²CFE, Culham Science Centre, Abingdon, UK


16.30 Break

Session FK-5 - Nuclear Fuel Materials

Chair: Yutai KATOH, USA

17.00 FK-5:IL01 Development of MA-Zr Hydride for Transmutation of Nuclear Wastes by Fast Reactor KENJI KONASHI¹, M. HIRA³, H. MATA³, K. KUROSAKI⁴, K. ITOH⁵, K. IKEDA¹, M. YAMAWAKI⁶, ¹IMR, Tohoku University, Ibaraki, Japan; ²Nippon Nuclear Fuel Dev. Co. Ltd., Ibaraki-ken, Japan; ³Div. of Sustainable Energy and Env. Eng., Osaka Univ., Osaka, Japan; ⁴Nuclear Dev. Corp., Ibaraki, Japan; ⁵Mitsubishi FBR Systems, Inc., Tokyo, Japan; ⁶Research Inst. of Nucl Eng., Univ. of Fukui, Fukui, Japan

17.30 FK-5:IL02 Study of Dissolution Mechanisms for Mixed Actinides Oxides N. DACHEUX, S. SZENKNECT, L. CLAPAREDE, N. CLAVIER, A. MESBAH, R. PODOR, ICSM UMR 5257, France, P. MOISY, CEA Marcoule, France

17.50 FK-5:IL03 Impact of PGM Particles during the Dissolution of Uranium Dioxide L. CLAPAREDE, T. CORDARA, S. SZENKNECT, A. MESBAH, R. PODOR, N. DACHEUX, ICSM UMR 5257, France, C. LAVALETTE, AREVA NC, Paris, France
Room: VIP

Session FK-10.2 - Challenging Waste Constituents

Chair: Celine CAU DIT COUMES, France

14.30 FK-10.2:IL01 X-Ray Diffraction and Adsorption Spectra Reveal Zr and Ti Coordination Environment in Actinides Immobilization by Glass-Ceramics

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

15.00 FK-10.2:IL02 Recovery of Actinides from Nuclear Waste Using Pyro-electrochemical Process

WEIQUN SHI, Laboratory of Nuclear Energy Chemistry, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China

15.30 FK-10.2:IL04 Removal of Noble Metals from High Level Liquid Waste by Silica-based Anion Exchangers

YUEZHOU WEI, X. WANG, S. NING, Guangxi University, Nanning, China; Y. WU, Q. ZOU, Shanghai Jiao Tong University, Shanghai, China
Room: MAGIONE A

Session FL-1 - Classes of Materials and their Synthesis and Chemical Modification

Chair: Phillip B. MESSERSMITH, USA

14.30 **FL-1:IL10** From Melanins to OLED Devices: Designing Electro-luminescent Materials Inspired to Human Pigments

P. MANINI, C.T. PRONTERA, V. CRISCUOLO, A. PEZZELLA, O. CRESCENNI, M. PAVONE, M. D’ISCHIA, Department of Chemical Science, University of Naples Federico II, Napoli, Italy; M.G. MAGLIONE, P. TASSINI, C. MINARINI, Lab. Nanomaterials and Devices, ENEA C.R. Portici, Portici, Italy

15.10 **FL-1:IL11** Bioinspired Self-organization of Functional Materials

L. HELMBRECHT, H.C. HENDRIKSE, A. VAN DER WEIJDEN, W.L. NOORDUIN, AMOLF, Amsterdam, The Netherlands

15.50 Break

Session FL-2 - Electronic Devices with Biological and Bio-inspired Materials

Chair: Paola MANINI, Italy

16.20 **FL-2:IL01** Self-organized and Self-assembled Organic Bioelectronics for Applications in Medicine and Plant Biology

M. BERGGREN, Laboratory of Organic Electronics, Linköping University, Norrköping, Sweden

17.00 **FL-2:IL02** Electronic Interface with Plants

E. STAVRINIDOU, Linköping University, Norrköping, Sweden
Room: ORVIETO A

Session FM-3 - Emerging Applications for Non-volatile Memories

Chair: Michael KOZICKI, USA


15.00 FM-3:IL19 Dynamics of HfO2-based Resistive Memory for Neuromorphic Computation S. BRIVIO, J. FRASCAROLI, E. COVI, S. SPIGA, Laboratorio MDM, IMM-CNR, Agrate Brianza, Italy

15.30 Break

Session FM-2 - Resistance Switching (RRAM) and Phase Change (PCM) Memories

Chair: Yusuf LEBLEBICI, Switzerland

16.00 FM-2:IL01 Simplified Resistive Memory for CMOS Integration M.N. KOZICKI, School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, USA

16.30 FM-2:L02 Impact of the Transistor Current Control on the Multiple Resistive Switching Properties in 1T1R RRAM Devices E. PEREZ, M.K. MAHADEVAAH, Ch. WENGER, IHP, Frankfurt (Oder), Germany; C. ZAMBELLI, P. OLIVO, Università degli Studi di Ferrara, Ferrara, Italy

16.50 FM-2:L03 Atomic Layer Deposition of Oxygen Deficient TaOx Dielectrics for Resistive Switching Memory Applications A.M. MARKEEV1, K.V. EGOROV1, D.S. KUZMICHEV1, D.I. MYKOTA1, V.A. GRITSENKO2, T.V. PEREVALOV2, C.S. HWANG3, 1Moscow Institute of Physics and Technology, Dolgoprudny, Moscow region, Russia; 2Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia; 3Department of Materials Science and Technology, Seoul National University, Seoul, South Korea

17.10 FM-2:L04 Tuning the Switching Properties of ZnO Thin Film Memristors by Al Doping via ALD C. GIOVINAZZO, C. RICCIARDI, S. PORRO, Politecnico di Torino, Department of Applied Science and Technology, Torino, Italy
Room: ORVIETO B

Session FN-2 - Structural Characterization

Chair: Vasily T. LEBEDEV, Russia

14.30  FN-2:IL02  Vibrational Spectroscopy Characterization of Nanographenes and Polyynes
M. TOMMASINI, Dipartimento di Chimica, Materiali e Ingegneria Chimica, Politecnico di Milano, Milano, Italy

15.00  FN-2:IL03  Advanced Electron Microscopy Techniques applied to Carbon Nanomaterials and Composites
O. ERSEN, G. MELINTE, Institut de Physique et Chimie des Matériaux de Strasbourg (IPCMS), UMR 7504 CNRS - Université de Strasbourg, Strasbourg Cedex, France

15.30  Break

Session FN-4 - Applications

Chair: Etienne GHEERAERT, France

16.00  FN-4:IL01  BDD Multi-electrode e-tongue for Analytical Detection in Complex Media
B. ZRIBI, D. KAMOLNI BELGHITI, E. SCORSONE, P. BERGONZO, CEA-LIST, Diamond Sensors Laboratory, Gif-sur-Yvette, France

16.30  FN-4:IL02  Synthesis, Properties and Applications of Carbon Nanodots
M. PRATO, University of Trieste, Trieste, Italy

17.00  FN-4:IL03  Nanocarbons and Carbon Nanotubes -Safe Innovation and Promise for the Future-
MORINOBU ENDO, shinshu University, Nagano, Japan

17.30  FN-4:L04  Understanding the Kinetics of Heavy Metals on Epitaxial Graphene: Towards Monitoring the Water Quality
I. SHTEPLIU, M. VAGIN, I. IVANOVI, T. IAKIMOVI, R. YAKIMOVI, Department of Physics, Chemistry and Biology, Linköping University, Linköping, Sweden

17.50  FN-4:L11  Graphene-based Materials for the Fast Adsorption of Biomolecules
M. SEREDYCH1, F. MENG1, L. MIKHALOVSKA2, S. MIKHALOVSKY2, V. MOCHALIN1, Y. GOGOTSI1, 1Department of Materials Science & Engineering and A.J. Drexel Nanomaterials Institute, Drexel University, Philadelphia, PA, USA; 2Department of Chemistry, Missouri University of Science & Technology, Rolla, MO, USA; 3School of Pharmacy and Biomolecular Sciences, University of Brighton, Lewes Road, Brighton, UK
Session FO-2 - New Superconductors of the Pnictides and Related Families

Chair: Xingjiang ZHOU, China

14.30  FO-2:IL04  Irradiation-induced Decoupling between Critical Temperature and Energy Gaps in P-doped Ba-122 Films
D. DAGHERO, M. TORTELLO, L. GOZZELINO, R.S. GONNELLI, Dipartimento di Scienza Applicata e Tecnologia, Politecnico di Torino, Torino, Italy; T. HATANO, T. KAWAGUCHI, H. IKUTA, Department of Crystalline Materials Science, Nagoya University, Nagoya, Japan

15.00  FO-2:IL05  Electronic and Magnetic Structures of H-doped 1111-type High Tc Superconductors
SOShI IIMURA, HIDEO HOSONO, Tokyo Institute of Technology, Yokohama, Japan

15.30  Break

Session FO-3 - Properties of Superconductors

Chair: John WEI, Canada

16.00  FO-3:L06  Comprehensive Phase Diagram of Two-dimensional Space Charge Doped Bi2Sr2CaCu2O8+x
E. STERPETTI, J. BISCARAS, A. ERB, A. SHUKLA, Institut de Minéralogie, de Physique des Matériaux et de Cosmochimie, Sorbonne Université Paris 06, UMR CNRS 7590, MNHN, IRD UMR 206, Paris, France; Walther Meissner Institut für Tiefenforschung, Bayerische Akademie der Wissenschaften, Garching Germany

16.20  FO-3:L07  Effects of Dy2O3 doping on the Anisotropy and Transport of MgB2 Wires
M.D. SUMPTION, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH, USA

16.40  FO-3:L08  Properties and Structure of MgB2-based Superconductors
T. PRIKHNA, V. ROMAKA, M. EISTERER, A. KOZYREV, V. SHAPOVALOV, A. SHATERNIK, V. Bakul Institute for Superhard Materials of the National Academy of Sciences of Ukraine (NASU), Kiev, Ukraine; Lviv Polytechnic National University, Lviv, Ukraine; Atomistitut, TU Wien, Vienna, Austria
Session FP-1 - Advances in Biomaterials

Chair: Tsutomu FURUZONO, Japan

**14.30**  FP-1/IL12 Calcium Phosphate Surfaces and Bone Regeneration
C. STAELLI, M. BOHNER, RMS Foundation, Bettlach, Switzerland

**15.00**  FP-1/IL13 Programmable Biomaterials for Mechanobiology
J.H. HENDERSON, Syracuse Biomaterials Institute, Syracuse University, Syracuse, NY, USA

**15.30**  FP-1/L14 Fabrication and Evaluation of Beta-tricalcium Phosphate Granules Cement
KUNIO ISHIKAWA, Dept. of Biomaterials, Faculty of Dental Science, Kyushu University, Fukuoka, Japan

**15.50**  FP-1/L16 Synthesis and Characterization of Copper Oxide Based Polymeric Nano-systems for Biomedical Imaging
I.S. WEITZ, O. PERLMAN, S.S. SIVAN, H. AZHARI, 1Department of Biotechnology Engineering, ORT Braude College, Karmiel, Israel; 2Department of Biomedical Engineering, Technion-Israel Institute of Technology, Technion City, Haifa, Israel

**16.10** Break

Session FP-3 - New Therapeutics and Intelligent Drug/Biomolecule/Gene Delivery Systems

Chair: Vladimir TORCHILIN, USA

**16.40**  FP-3/IL01 Rational Design of Polyrotaxanes as a Therapeutic Agent to Metabolic Diseases
ATSUSHI TAMURA, NOBUHIKO YUI, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan

**17.10**  FP-3/IL02 Novel Multifunctional Drug and Gene Delivery Systems based on Supramolecular Self-assembled Macromolecules
JUN LI, Department of Biomedical Engineering, National University of Singapore, Singapore
Room: CORCIANO

Session FA-2 - Device Physics, Mechanics and Design

Chair: Darren LIPOMI, USA

9.30  FA-2:IL04  A Highly Sensitive Flexible Sensor Analog to Human Skin Via Air-assembled Motile Electronic Whiskers
J. REEDER, T. KANG, S. RAINS, W. VOIT, University of Texas at Dallas, Richardson, TX, USA

10.10 FA-2:IL05  Soft Platinum-silicone Coating for the Epidural Stimulation of the Spinal Cord
G. SCHIAVONE, S.P. LACOUR, LSBI, EPFL Campus Biotech, Laboratory for Soft Bioelectronic Interfaces, School of Engineering, Geneva, Switzerland

10.50  Break

Session FA-1 - Materials and Fabrication Processes

Chair: Mario CAIRONI, Italy

11.20 FA-1:IL08  Semiconducting: Insulating Polymer Blends: Towards Flexible, Robust Organic Optoelectronic Devices
N. STINGELIN, Georgia Institute of Technology, Atlanta, GA, USA

12.00 FA-1:LO9  Designing Novel Polymer Systems with Enhanced Dielectric Response
V. BOBNAR, Condensed Matter Physics Department, Jožef Stefan Institute, Ljubljana, Slovenia; Y. BEERAN, S. THOMAS, Mahatma Gandhi University, International University Centre for Nanoscience and Nanotechnology, Kottayam, Kerala, India; Y. GROHENES, Université de Bretagne, Sud LiMATB Laboratory, Lorient, France; V. KOKOL, University of Maribor, Institute for Engineering Materials and Design, Maribor, Slovenia; Y. THAKUR, Q. ZHANG, Electrical Engineering Department and Materials Research Institute, The Pennsylvania State University, University Park, PA, USA
Focused Session FB-6

PEROVSKITE PHOTOVOLTAICS

Room: ASSISI A

Chair: Tsutomu MIYASAKA, Japan (Convener)

9.25 Welcome

Session FB-6.1 - Material Synthesis and Processing

9.30 FB-6.1.I.01 Efficient Sulfur-based Hole Transporting Materials for Perovskite Solar Cells
N. MARTIN, Depto de Química Orgánica, Facultad de Química, Universidad Complutense, Madrid, Spain; IMDEA-Nanoscience, Madrid, Spain

10.00 FB-6.1.I.04 Understanding the Effect of Precursor Solution Aging in Triple-cation Lead Perovskite
P. BOONMONGKOLNAS, DAEHAN KIM, BYUNGHA SHIN, Dept. of Materials Science and Eng., Korea Advanced Institute of Science and Technology, Daejeon, South Korea

10.20 FB-6.1.I.03 Molecular Engineering of Hole-transporting Materials for Perovskite Solar Cells
A. MOLINA-ONTORIA1, I. ZIMMERMANN2, J. URIETA1, J. ARAGO3, E. ORTI4, M.K. NAZERUDDIN5, N. MARTIN6, 7, IMDEA-Nanoscience, Campus de Cantoblanco, Madrid, Spain; 2Ecole Polytechnique Fédérale de Lausanne, Sion, Switzerland; 3Dept. of Organic Chemistry, Faculty of Chemistry, University Complutense, Madrid, Spain; 1Instituto de Ciencia Molecular, Universidad de Valencia, Paterna, Spain

10.50 Break

Session FB-6.3 - Material and Device Stability

Chair: Agustin MOLINA ONTORIA, Spain

11.20 FB-6.3.I.01 Novel Materials for Stable Perovskite Solar Cells
A. ABATE, Helmholtz-Zentrum Berlin, Berlin, Germany

11.50 FB-6.3.I.02 How to Assess Operational Stability of Perovskite Solar Cells with ReversibleDegradation?
M.V. KHENKIN1, K.M. ANOOP1, I. VISOLY-FISHER2, Y. GALAGAN2, F. DI GIACOMO3, B. RAMESH PATIL4, G. SHERAFATIPOUR5, V. TURKOVIC6, M. MADSEN7, T. MERCK8, G. UYTERHOEVEN9, J.P. A. BASTOS10, T. AERNOUTS11, F. BRUNETTI12, M. LIRA-CANTU13, E.A. KATZ14, 1Dept. of Solar Energy and Environmental Physics, Swiss Inst. for Dryland Environmental and Energy Research, J. Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Midreshet Ben-Gurion, Israel; 2Ilse Katz Inst. for Nanoscale Science and Technology, Ben-Gurion University of the Negev, Beersehera, Israel; 3Holst Centre - Solliance, Eindhoven, Netherlands; 4SDU NanoSyD, Mads Clausen Inst., University of Southern Denmark, Sønderborg, Denmark; 5IMEC-a partner in Solliance, Leuven, Belgium; 6Dept. Electrical Eng., KU Leuven, Leuven, Belgium; 7CHASE (Centre for Hybrid and Organic Solar Energy), Dept. of Electronic Eng., University of Rome Tor Vergata, Rome, Italy; 8Catalan Inst. of Nanoscience and Nanotechnology (ICN2), CSIC and The Barcelona Inst. of Sci. and Tech., Campus UAB, Bellaterra, Barcelona, Spain
Room: ASSISI B

Session FC-2 - Hydrogen Storage

Chair: Yaroslav FILINCHUK, Belgium

9.30 **FC-2.2:IL02** Stability of Complex Hydrides
HEENA YANG, A. ZUETTEL, LMER, ISIC, SB, École polytechnique fédérale de Lausanne (EPFL) Valais/Wallis, Energypolis, Sion, Switzerland; Empa Materials Science and Technology, Dübendorf, Switzerland

10.00 **FC-2.2:IL03** Mesoporous Carbons for the Nano-confinement of Hydrogen Storage Materials
R. JANOT, Laboratoire de Réactivité et Chimie des Solides (LRCs), UMR 7314 CNRS, Amiens, France

10.20 **FC-2.2:IL04** Mg(BH4)2 : Synthesis, Nano-confinement and Catalysis
D. CLEMENÇON, J-N. CHOTARD, R. JANOT, Laboratoire de Réactivité et Chimie des Solides (LRCs), UMR 7314 CNRS, Université de Picardie Jules Verne, Amiens, France

10.40 **FC-2.2:IL05** Thermodynamic Stability of Multi-cation Complex Hydrides
E.M. DEMATTEIS, M.G. POLETTI, M. BARICCO, University of Turin & NIS, Torino, Italy; A. SANTORU, C. PISTIDDA, M. DORNHEIM, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany

11.00 Break

Chair: Luca PASQUINI, Italy

11.30 **FC-2.3:IL01** Borohydride-water Based Chemical Hydrogen Carriers for On-board Hydrogen Storage
U.B. DEMIRCI, University of Montpellier IEM, UMR5635, CNRS-ENSMC-UM, Montpellier, France

12.00 **FC-2.3:IL03** Chemical Hydrides as Precursors for the Growth of 2D Materials
F. LEARDINI, Departamento de Física de Materiales, Universidad Autónoma de Madrid, Madrid, Spain
Room: NORCIA

Session FD-1 - Batteries

Chair: Duncan GREGORY, UK

9.00  FD-1:IL16 New Developments in Three-dimensional Microbatteries
E. COHEN1, S. MENKIN1, H. RAGONES1, M. LIFSHITS1, Y. KAMIR2, G. KOSA2, D. GOLODNITSKY1, 1School of Chemistry, Tel Aviv University, Tel Aviv, Israel; 2Department of Biomedical Engineering, University of Basel, Switzerland

9.40  FD-1:IL17 Liquid and Solid State NMR Investigations of Low MW Polyether and Non-polyether Polymer Electrolytes for Supercapacitor and Battery Applications
M. GOBET, JING PENG, S. MUNOZ, D. MORALES, S.G. GREENBAUM, Hunter College of CUNY, New York, NY, USA; L. CARBONE, J. HASSOUN, University of Ferrara, Ferrara, Italy; R. RUTHER, J. NANDA, Oak Ridge National Laboratory, Oak Ridge, TN, USA; M. ZIMMERMAN, R. LEISING, Ionic Materials, Inc. Woburn, MA, USA

10.20 FD-1:IL18 Polymeric Electrode Materials for Organic Batteries
A. LEX-BALDUCCI, S. MÜNCH, C. FRIEBE, R. BURGES, M.D. HAGER, U.S. SCHUBERT, Laboratory of Organic and Macromolecular Chemistry (OMC), Friedrich Schiller University Jena, Jena, Germany; Center for Energy and Environmental Chemistry Jena (CEEC Jena), Friedrich Schiller University Jena, Jena, Germany

10.50  Break

Chair: Shigeto OKADA, Japan

11.20  FD-1:IL19 Challenging the Fabrication of Ultra-thick Electrodes for Higher Energy Density Batteries
L. ZOLIN, W. PORCHER, CEA Grenoble - Liten, Grenoble, France; J. GAUBICHER, D. GUYOMARD, B. LESTRIEZ, IMN CNRS/University of Nantes, Nantes, France

12.00  FD-1:IL20 Ions, Electrons, and Phonons: On the Movement of Charge through Solids
B.C. MELOT, Department of Chemistry, University of Southern California, Los Angeles, CA, USA
Session FE-2 - Proton-conducting (PEFCs) and Alkaline (AFCs) Polymer Electrolyte Fuel Cells

Chair: Dario R. DEKEL, Israel

9.00 FE-2:IL04 Nano-structured Hydrogen Oxidation Electrocatalysts for Anion Exchange Membrane Fuel Cells

9.40 FE-2:IL05 Proton Conductivity in Intermediate Temperature Electrolyte Membranes - New Insights and Perspectives
QINGFENG LI, D. AIIL, H. BECKER, L.N. CLEEMANN, J.O. JENSEN, Section of Proton Conductors, Department of Energy Conversion and Storage, Technical University of Denmark, Lyngby, Denmark

10.20 FE-2:IL06 State-of-the-art polymer Electrolyte Fuel Cells (PEFC): The Remaining Research Challenges
K.A. FRIEDRICH, P. GAZDZICKI, J. MITZEL, M. SCHULZE, German Aerospace Center (DLR), Institute of Engineering Thermodynamics, Stuttgart, Germany; R. HIESGEN, University of Applied Sciences Esslingen, Department of Basic Science, Esslingen, Germany

Chair: Qing Feng LI, Denmark

11.00 Break

11.30 FE-2:IL07 Ti-based Perovskite Materials as Co-catalysts and Membrane Additives in Proton-conducting Polymer Electrolyte Fuel Cells
M.A. NAVARRA, L. MAZZAPIODA, S. PANERO, Department of Chemistry, Sapienza University of Rome, Rome, Italy

12.10 FE-2:IL08 Cobalt Platinum Bronze as a Catalyst for Polymer Electrolyte Fuel Cells
YUJI KAMITAKA, YU MORIMOTO, Toyota Central R&D Labs., Inc., Nagakute, Aichi, Japan
Room: SALA RELATORI

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

Chair: Woochul KIM, South Korea

9.30  FF-3:IL01  Next Generation Thermionic Energy Conversion for Space Application
      V.I. KUZNETSOV, Ioffe Institute, St. Petersburg, Russia

10.10  FF-3:L03  STEALS a Modular Direct Conversion Thermal System with Integrated Storage

10.40  FF-3:L04  Radioisotope Thermoelectric Generators for the European Space Nuclear Power Programme

11.10  Break

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

Chair: Ernst BAUER, Austria

11.40  FF-2:IL03  High Electron Mobility and Stability of n-type Mg3(Sb,Bi)2
        TSUTOMU KANNO, H. TAMAKI, H.K. SATO, Panasonic Corporation, Seika, Kyoto, Japan; Y. MIYAZAKI, Tohoku University, Sendai, Miyagi, Japan

12.20  FF-2:IL08  Development of Thermoelectric Borides toward Topping Cycles
        TAKAO MORI, National Institute for Materials Science (NIMS), Tsukuba, Japan
Room: SPOLETO A

Session FG-2 - Soft Magnetic Materials

Chair: Cristina GOMEZ-POLO, Spain

9.30 FG-2:IL05 Magnetic Properties of Electrocatalytically Active 3D Nanoporous Fe-containing Metallic Films Prepared by Micelle-assisted Electrodeposition
E. PELLICER1, E. ISARAIN-CHÁVEZ1, M.D. BARÓ1, J. SORT1,2, 1Departament de Física, Universitat Autònoma de Barcelona, Bellaterra, Spain; 2Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain

10.00 FG-2:IL06 Multi-parameter Search of Optimal Properties of Soft Magnetic Microwires
A. CHIZIK1, J. GONZALEZ1, A. ZHUkov1,2, A. STUPAKIEWICZ2, 1Universidad del País Vasco, UPV/EHU, San Sebastián, Spain; 2IKERBASQUE, Basque Foundation for Science, Bilbao, Spain

10.20 FG-2:IL07 Soft Magnetic Ferrites for Biomedical Applications
P. TIBERTO, G. BARRERA, F. CELEGATO, M. COISSON, Nanoscience and Materials Division, INRIM, Torino, Italy

10.50 Break

Chair: Paola TIBERTO, Italy

11.20 FG-2:IL08 Magnetite Nanoparticles Biosynthesized by Magnetotactic Bacteria for Biomedical Application
M.L. FERNANDEZ-GUBIEDA, Departamento de Electricidad y Electrónica, Universidad del País Vasco UPV/EHU, Leioa, Spain

Session FG-3 - Magnetocaloric and Multifunctional Magnetic Materials

Chair: Cristina GOMEZ-POLO, Spain

11.50 FG-3:IL02 Thermodynamics of Multicaloric Materials
T. CASTAN, LL. MÁNOSA, A. PLANES, Departament de Física de la Matèria Condensada, Facultat de Física, Universitat de Barcelona, Spain; A. SAXENA, Los Alamos National Laboratory, NM, USA; E. STERN, Department of Materials Science, University of Cambridge, UK
Room: SALA STAMPA

Session FH-2 - Understanding Fundamentals of Photo-induced Processes and Charge Transport

Chair: Detlef BAHNEMANN, Germany

9.30  FH-2:L05  Recent Advances in the Search of Effective Materials for Photo-electrochemical Water Splitting
J. AUGUSTYNSKI, Centre for New Technologies, University of Warsaw, Warsaw, Poland

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

10.40  Break

Session FH-3 - Design Approaches for Advanced Applications

Chair: Ladislav KAVAN, Czech Republic

11.10 FH-3:L01  Design Rules for Photoactive Materials for Photo Electrochemical Solar Energy Conversion
W. JAEGERMANN, Surface Science Division, TU Darmstadt Materials Science, Darmstadt Germany

11.50 FH-3:L02  Strategies for Stable Water Splitting via Protected Photoelectrodes
I. CHORKENDORFF, SurfCat, Department of Physics, The Technical University of Denmark, Kongens Lyngby, Denmark
### Session FI-2 - Optoelectronic and Photonic Processes

**Chair:** Yasushi NANISHI, Japan

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<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
<th>Institution(s)</th>
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<tr>
<td>9:00</td>
<td>FI-2:IL01 Metal Halide Perovskites Light Emitting Devices and Interface Stability</td>
<td>B.P. RAND, Department of Electrical Engineering and Andlinger Center for Energy and the Environment, Princeton University, Princeton, NJ, USA</td>
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<td>9:40</td>
<td>FI-2:IL02 Realization of High Performance UV Emitters by using AlGaN Materials</td>
<td>MOTOAKI IWAYA1, TETSUYA TAKEUCHI1, SATOSHI KAMIYAMA1, ISAMU AKASAKI1,2, 1Faculty of Science and Technology, Meijo University, Japan; 2Akasaki Research Center, Nagoya University, Japan</td>
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<td>11:00</td>
<td>Break</td>
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<td>11:30</td>
<td>FI-2:IL04 Indirect Excitons in Group III-Nitride-Based Quantum Wells</td>
<td>P. LEFEBVRE, B. JOUAULT, T. GUILLET, C. BRIMONT, P. VALVIN, T. BRETAGNON, M. VLADIMIROVA, Laboratoire Charles Coulomb (L2C), CNRS, University of Montpellier, France; L. LAHOURCADE, N. GRANDJEAN, Institute of Condensed Matter Physics, EPFL, Lausanne, Switzerland; B. DAMILANO, CRHEA-CNRS, Valbonne, France</td>
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<td>12:10</td>
<td>FI-2:IL05 Enhancing the Electroluminescence of Organic Light-emitting Transistors by Modifying the Metal/Organic Interface with Conjugated Polar Polymers</td>
<td>M. PROSA1, E. BENVENUTI1, M.C. PASINI1, F. GALEOTTI1, U. GIOVANELLA2, M. MUCCINI2, S. TOFFANIN1, 1ISMN - CNR, Bologna, Italy; 2ISMAC - CNR, Milano, Italy</td>
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Room: CASCIA

Session FJ-2 - Material Design and Device Development

Chair: Demothenes KOUTSOGEORGIS, UK

9.00 FJ-2:IL06 Investigating the Effects of Nanostructured Dielectric Lithium Fluoride and Plasmonic Gold Interlayers in Organic Photovoltaics
H. KURT, Istanbul Medipol University, Istanbul, Turkey; CLEVA W. OW-YANG, Sabanci University, Istanbul, Turkey

9.40 FJ-2:IL07 Alternative Transparent Conductors for Flexible CIGS Thin Film Solar Cells
Y.E. ROMANYUK, L. GREUTER, T. FEUER, R. CARRON, S. NISHIWAKI, S. BUECHELER, A.N. TIWARI, Empa - Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland

10.20 FJ-2:IL08 Flexible, Transparent and Conductive Ag Nanowire Networks
D. BELLET 1, T. SANNICOLÒ 2, S. AGHAZADEHCHORSI 1,2, T. PAPANASTASIOU 1, H. VIET-NGUYEN 4, D. MUNOZ-ROJAS 1, C. JIMENEZ 1, N.D. NGUYEN 2, 1Univ. Grenoble Alpes, LMGP, CNRS, Grenoble, France; 2Univ. Grenoble Alpes, CEA LITEN, Grenoble, France; 3Univ. of Liège, Département de Physique, Liège, Belgium; 4CEA-INES, LITEN, Le Bourget-du-Lac, France

11.00 Break

Chair: Daniel BELLET, France

11.20 FJ-2:IL09 Computational Approach to Synthesis of Functional Polymorphs
D. GINLEY 1, A. ZAKUTAYEV 1, K. PERSSON 2, L. GARTNER 1, P. SELVARASU 1, J. PERKINS 1, WENHAO SUN 2, K. POPOV 2, S. DWARAKNATH 2, G. CEDER 2, J. MANGUM 2, B. GORMAN 2, L. SCHELHAS 1, M. TONEY 1, M. AYKOL 2, Z. CHAN 1, D. NOCERA 2, J. HAGGERTY 2, O. AGIRSEVEN 1, J. TATE 1, D. KITCHAEV 1, W. TUMAS 1, 1National Renewable Energy Laboratory, Golden, CO, USA; 2Lawrence Berkeley National Laboratory, USA; 3Colorado School of Mines, USA; 4SLAC National Accelerator Laboratory, USA; 5Harvard University, USA; 6Oregon State University; 7Massachusetts Institute of Technology, USA

12.00 FJ-2:IL10 Graphene Films as Transparent Electrodes
D. NEUMAIER, AMO GmbH, Aachen, Germany

12.40 FJ-2:L11 Response to Mechanical Bending Stress of AZO/Ag AZO Thin Films
G. TORRISI 1,2, I. CRUPI 1, S. MIRABELLA 1,2, A. TERRASI 1,2, 1University of Catania, Italy; 2CNR-IMM, Catania, Italy; 3University of Palermo, Italy
Room: SPOLETO B

Session FK-5 - Nuclear Fuel Materials

Chair: Kenji KONASHI, Japan

9.30 FK-5:L04 Response of Commercial MAX-phases to Neutron Irradiation to Intermediate Fluences
YUTAI KATOH1,2, CAEN ANG2, P. EDMONDSON1, TAKAAKI KOYANAGI1, 1Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA; 2University of Tennessee, Knoxville, TN, USA

10.00 FK-5:L06 High Temperature X-Ray Diffraction Studies of Surrogates for Americium Oxides
E.J. WATKINSON, R.M. AMBROSI, J. NAJORKA, Department of Physics and Astronomy, University of Leicester, Leicester, UK; Natural History Museum, London, UK

10.20 FK-5:L07 Conversion of Surrogate and Uranium Oxide by Solution Combustion Synthesis
J. MONNIER1, X. DESCHANELS1, C. REY1, E. WELCOMME2, 1CEA Marcoule - Institut de Chimie Séparative de Marcoule (ICSM) - LNER, Bagnols sur Cèze, France; 2CEA Marcoule - ATALANTE - DMRC, France

10.40 Break

Chair: Viacheslav M. CHERNOV, Russia

11.10 FK-5:L09 Dissolution of Uranium Thorium Mixed Oxides: The Role of Nitrous Acid
T. DALGER, S. SZENKNECT, L. CLAPAREDE, N. DACHEUX, Institut de Chimie Séparative de Marcoule, ICSM UMR 5257, CNRS, CEA, Univ. Montpellier, ENSCM, Bagnols sur Cèze cedex, France; P. MOISY, CEA, Nuclear Energy Division, Research Department of Mining and Fuel Recycling Processes, Bagnols-sur-Cèze, France

11.30 FK-5:L10 Zirconium Carbide (ZrC) for High Temperature Nuclear Environments - Probing the Local Structure using NMR
DHAN-SHAM RANA, I. FARNAN, Department of Earth Sciences, University of Cambridge, Cambridge, UK
Room: VIP

Session FK-10.3 - Waste Form Performance Testing, and Characterization

Chair: Sophie SCHULLER, France

10.30 FK-10.3:IL01 Modern Irradiation Testing Techniques to Simulate the Irradiation Performance of Waste Forms
S. PEUGET¹, A.H. MiR², S. MIRO², Y. SERRUYS², I. MONNET², C. JEGOU¹, ¹CEA, DEN, DEA2, SEVT, LMPA, Laboratoire d’Etude des Matériaux et Procédés Actif, Bagnols-sur-Cèze, France; ²CIMAP-GANIL (CEA-CNRS-ENSICAEN-Univ. Caen), Caen Cedex, France; ³CEA, DEN, Service de Recherches de Métallurgie Physique, Laboratoire JANNUS, Gif-sur-Yvette, France

11.00 FK-10.3:IL02 Impact of Near Field Evolution on the Stability of Vitrified Waste and Spent Nuclear Fuel
K. LEMMENS, C. CACHOIR, K. FERRAND, T. MENNECART, S. CAES, E. VALCKE, Belgian Nuclear Research Centre, Mol, Belgium

11.30 Break

Chair: Kevin FOX, USA

12.00 FK-10.3:IL03 Synchrotron-based Three-dimensional X-ray Imaging of Crystalline Ceramic Waste Form Materials
WILSON K.S. CHIU, Department of Mechanical Engineering, University of Connecticut, Storrs, CT, USA

Session FK-10.4 - Waste Immobilization Facilities and Repository Design

12.30 FK-10.4:IL01 International Experience in Radioactive Waste Vitrification
M.I. OJOVAN, R.A. ROBBINS, International Atomic Energy Agency (IAEA), Vienna, Austria
Session FL-3 - Photonic Devices with Biological and Bio-inspired Materials

Chair: Matjaz HUMAR, Slovenia

9.30  FL-3:IL01  Photonic Crystals Composed of 99% Water and 1% Inorganic Nanosheet
YASUHIRO ISHIDA, RIKEN Center for Emergent Matter Science, Japan

10.10  FL-3:IL02  Biologically Inspired Soft and Fluid Optical Materials
M. KOLLE, S. NAGELBERG, J. SANDT, Massachusetts Institute of Technology, Cambridge, MA, USA

10.50  Break

C. DIETRICH1,2, A. GRAF1,2, L. TROPF1, M. KARL1, A. KÄMPF1, M. SCHUBERT1, N.M. KRONENBERG1, Y. ZAKHARKO3, S. HÖFLING1,2, J. ZAUMSEIL3, M.C. GATHER1, 1School of Physics and Astronomy, University of St Andrews, St Andrews, UK; 2Technische Physik, Universität Würzburg, Würzburg, Germany; 3Institute for Physical Chemistry, Universität Heidelberg, Heidelberg, Germany
Room: ORVIETO A

Session FM-2 - Resistance Switching (RRAM) and Phase Change (PCM) Memories

**Chair:** Hugh BARNABY, USA

9.00 **FM-2:IL10** Mechanisms and Nanoscale Processes in Resistive Switching Memories
I. VALOV, Research Centre Juelich, Electronic Materials (PGI-7), Juelich, Germany

9.30 **FM-2:L11** MIS Structures with Interfacial Graphene for RRAM Applications: A Nanoscale and Device Level Characterization
S. CLARAMUNT, QIAN WU, M. PORTI, M. NAFRIA, X. AYMERIC, Electronic Eng. Dept., Univ. Autònoma de Barcelona, Bellaterra, Spain

9.50 **FM-2:L12** An Electrochemical Metallization Memory Cell Based on a Single ZnO Nanowire
G. MILANO, S. PORRO, C. RICCIARDI, Politecnico di Torino, Dept. of Applied Science and Tech., Torino, Italy, Istituto Italiano di Tecnologia, Center for Sustainable Future Technologies, Torino, Italy

10.10 **FM-2:L14** Multi-level Resistive Switching in Core-Shell ZnO Nanowires Exhibiting Tunable Surface States
S. PORRO, F. RISPLENDI, G. MILANO, G. CICERO, C. RICCIARDI, Politecnico di Torino, Dept. of Applied Science and Tech., Torino, Italy

10.30 Break

**Chair:** Sabina SPIGA, Italy

11.00 **FM-2:IL05** Resistive Memory Technology and Applications
H.J. BARNABY, School of Electrical, Computer and Energy Engineering Arizona State University, Tempe, AZ, USA

11.30 **FM-2:L06** Dynamics of the Electroforming Process of Valence Change Memory Cells
S. MENZEL, A. MARCHEWKA, T. HEISIG, C. BÄUMER, R. DITTMANN, R. WASER, Forschungszentrum Jülich, Peter Grünberg Institut (PGI-7), Jülich, Germany; RWTH Aachen, Institut für Werkstoffe der Elektrotechnik (IWE 2), Aachen, Germany

11.50 **FM-2:L07** Effect of Heavy Ion Radiation on Resistive Switching in HfOx based RRAM Devices Grown by MBE
S. PETZOLD, S.U. SHARATH, J. LEMKE, E. HILDEBRANDT, C. TRAUTMANN, L. ALFF, Inst. of Materials Science, Technische Univ. Darmstadt, Darmstadt, Germany; Materials Research Dept., Gesellschaft für Schwerionenforschung (GSI), Darmstadt, Germany

12.10 **FM-2:L08** Nonvolatile Impedance Switching in Electroforming-free BFO Memristors

12.30 **FM-2:L09** Resistive Switching Modes and Dynamics in Defect Engineered Polycrystalline HfOx based RRAM Devices
S.U. SHARATH, S. PETZOLD, E. HILDEBRANDT, J. KURIAN, P. KOMMISSINSKIY, C. WENGERT, T. SCHROEDER, L. ALFF, Institute of Materials Science, TU Darmstadt, Darmstadt, Germany; IHP, Frankfurt (Oder), Germany; Brandenburgische Technische Universität, Cottbus, Germany
**Room:** ORVIETO B

**Session FN-3 - Properties**

**Chair:** Andrew WEE, Singapore

**9.30** FN-3:IL02 Electronic and Magnetic Structures of 3D Disordered Network of Nanographene Sheets under Heat Treatment at High Temperatures

**TOSHIAKI ENOKI,** Department of Chemistry, Tokyo Institute of Technology, Tokyo, Japan

**10.00** FN-3:IL03 Carbon Materials for Sodium-ion Batteries – and the Intriguing Case of Reversibly Intercalating Solvated Ions into Graphite

**P. ADELHELM,** Jena University, Jena, Germany

**10.30** FN-3:IL05 Functionalization in Graphene and Related Hybrids for Applications in Hydrogen Evolution Reaction

**LI-CHYONG CHEN,** Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; KUEI-HSIEN CHEN, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan

**11.00** Break

**Chair:** Philipp ADELHELM, Germany

**11.30** FN-3:IL06 The Organic-2D Transition Metal Dichalcogenide Interface

**ANDREW T.S. WEE,** Department of Physics, National University of Singapore, Singapore

**12.00** FN-3:L08 Oxide Ceramics Toughened by the Addition of Graphene flakes

**M. BONIECKI,** P.GOŁEBIEWSKI, K. KASZYCA, W. WESOŁOWSKI, M. WOŁUNTARSKI, A. PIATKOWSKA, M. ROMANIEC, P.CIEPLEWSKI, K. KRZYZAK, Institute of Electronic Materials Technology, Warsaw, Poland

**12.20** FN-3:L09 Detonation Nanodiamonds. Particles, Hydrosols and Gels

**A.Ya. VUL,** E.D. EIDELMAN, A.E. ALEKSEENSKIY, A.V. SHVIDCHENKO, A.T.DIDEIKIN, V.S.YUFEREV, Ioffe Institute, St.Petersburg, Russia; **V.T. LEBEDEV,** YU.V. KUL’VELIS, B.P. KONSTANTINOV, Petersburg Nuclear Physics Institute, National Research Centre “Kurchatov Institute”, Gatchina, Leninradskaya Region, Russia; **M.V. AVDEEV,** Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research, Dubna, Russia
Room: MONTEFALCO

Session FO-3 - Properties of Superconductors

Chair: Fabio BOSCHINI, Canada

9.30 FO-3:IL10 Density Waves of HTSC in Atomic Scale
JINHO LEE, Dept. of Physics and Astronomy, Seoul National University, Republic of Korea CCES, Institute of Basic Science, South Korea

10.00 FO-3:IL11 A Fresh View of the Unusual Properties of the Cu-Prates
N. BARISIC, Institute of Solid State Physics, TU Wien, Wien, Austria; Department of Physics, Faculty of Science, University of Zagreb, Zagreb, Croatia

10.30 Break

Chair: James STOREY, New Zealand

Session FO-4 - Theory and Mechanisms

11.00 FO-4:IL02 Superconductivity in Time Reversal Symmetry Breaking Compounds
HUIQIU YUAN, Center for Correlated Matter and Department of Physics, Zhejiang University, China

11.30 FO-4:IL03 Superconductivity in Topological Materials: Insights from Superconducting Density Functional Theory
RYOTARO ARITA, RIKEN Center for Emergent Matter Science, Saitama, Japan

Session FO-5 - Vortex Lattice Physics

12.00 FO-5:IL03 Flux Pinning in Oxypnictide Thin Films
KAZUMASA IIDA1, C. TARANTINI1, J. HANISCH1, F. KURTH2, J. JAROSZYNKI2, T. OHMURA2, T. MATSUMOTO1, T. URATA1,2, T. HATANO2, S. MEYER3, S. KAUFFMANN-WEISS4, B. HOLZAPFEL4, D.C. LARBALESTIER5, H. IKUTA1,2, 1Department of Crystalline Materials Science, Graduate School of Engineering, Nagoya University, Japan; 2Department of Materials Physics, Graduate School of Engineering, Nagoya University, Japan; 3Applied Superconductivity Center, National High Magnetic Field Laboratory, Florida State University, USA; 4Institute for Technical Physics, Karlsruhe Institute of Technology, Germany; 5Institute for Metallic Materials, IFW Dresden, Germany
WEDNESDAY  JUNE 13  MORNING

Room: MAGIONE B

Session FP-2 - Tissue Engineering and Regenerative Medicine

Chair: Jin Ho LEE, South Korea

9.30  FP-2:IL04  Cell Migration Mediated by Gradient Cues in Biomaterials
       CHANGYOU GAO, Zhejiang University, Hangzhou, China

10.00 FP-2:IL05  Polymeric and Biomimetic Porous Scaffolds for Tissue Engineering
         GUOPIING CHEN, NAOKI KAWAZOE, Research Center for Functional Materials, National Institute for Materials Science, Ibaraki, Japan

10.30 FP-2:L07  Injectable Amnion Membrane Hydrogels for Musculoskeletal Regenerative Engineering
         M. BHATTACHARJEE, J.L. ESCOBAR IVIRICO, H.M. KAN, L.S. NAIR, C.T. LAURENCIN, Institute for Regenerative Engineering, University of Connecticut Health Center, Farmington, CT, USA

10.50 FP-2:L08  Preparation, Characterization and In Vivo Performance of Decellularized Cornea
         AKIO KISHIDA, Y. HASHIMOTO, J. NEGISHI, K. NAM, T. KIMURA, S. SASAKI, Tokyo Medical and Dental University, Tokyo, Japan; S. SASAKI, T. HONDA, S. HATTORI, H. KOBAYASHI, NIMS, Ibaraki, Japan

11.10 Break

Session FP-4 - Nanomaterials Systems for Bio-imaging and Theranostics

Chair: Tony Y. HU, USA

11.40 FP-4:IL01  Surface Modified Nanoparticles for Biomedical Imaging
       PEILIN CHEN, Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan

12.10 FP-4:IL03  Tumour Environment Responsive Oligomeric Nanomedicine for Multimodality Theranostics
       ZHENGWEI MAO, Department of Polymer Science and Engineering, Zhejiang University, Hangzhou, China
Room: CORCIANO

Session FA-3 - Applications of Flexible/Stretchable Electronics

Chair: Francesco GRECO, Austria

14.30 FA-3/L01 Ultrathin, Imperceptible Electronics
M. KALTENBRUNNER, Soft Electronics Laboratory, Linz Institute of Technology, Johannes Kepler University Linz, Austria

15.10 FA-3/L04 Wearable Strain Sensors and Power Generators
I.A. ANDERSON, Biomimetics Lab, Auckland Bioengineering Institute, University of Auckland and StretchSense Ltd., Penrose, Auckland, New Zealand

15.50 Break

16.20 FA-3/L05 Metallic Nanoislands on Graphene and Machine Learning for Monitoring Swallowing Activity in Head and Neck Cancer Patients
J. RAMIREZ1, D. RODRIGUEZ2, FANG QIAO3, J. WARCHALL2, B.C. MARIN1, J. RYE1, E. AKLILE1, A.S-C. CHIANG1, P.P. MERCIER2, CK CHENG1, K.A. HUTCHESON4, E. SHINN4, D.J. LIPOMI1, 1Dept. of NanoEngineering, University of California, San Diego, La Jolla, CA, USA; Dept. of Electrical and Computer Engineering, University of California, San Diego, La Jolla, CA, USA; Dept. of Computer Science and Engineering, University of California, San Diego, La Jolla, CA, USA; Dept. of Computer Science and Engineering, University of California, San Diego, La Jolla, CA, USA; 4Dept. of Behavioral Sciences, The University of Texas M.D. Anderson Cancer Center, Unit 1330, Houston, TX, USA

16.50 FA-3/L06 Development of Lead-free Piezoelectric Ceramic Nanofiber Modules for Flexible Structural Health Monitoring Sensor Application
SANG HYUN JI, Ji SUN YUN, Electronic Convergence Materials Division, Korea Institute of Ceramic Engineering and Technology, Jinju, South Korea
WEDNESDAY JUNE 13 AFTERNOON

Room: ASSISI A
Chair: Santosh SHRESTHA, Australia

Session FB-3 - Organic, Dye Sensitised and Nano-particle Photovoltaics

14.30 FB-3:L06 Development of New Narrow Bandgap \( \pi \)-Conjugated Small Molecules for Organic Solar Cells
SEIICHI FURUKAWA, H. KOMIYAMA, T. YASUDA, Kyushu University, Fukuoka, Japan

Session FB-4 - Multiple Energy Level Devices

14.50 FB-4:IL01 Two Step Photon Absorption in III-V Solar Cells
V. TASCO, A. PASSASEO, CNR-Nanotec, Nanotechnology Institute, Campus Ecotekne, Lecce, Italy; A. CRETI, M. LOMASCOLO, IMM-CNR Institute for Microelectronic and Microsystems, Campus Ecotekne, Lecce, Italy

15.20 Break

15.50 FB-4:IL02 Recent Advances in Intermediate Band Solar Cells
A. MARTI, J. VILLA, E. ANTOLIN, F.G. LINARES, C.TABLERO, A.LUQUE, Instituto de Energía Solar, Universidad Politécnica de Madrid, Madrid, Spain; I. RAMIRO, ICFO-Institut de Ciències Fotòniques, Barcelona, Spain; E. LOPEZ, Fraunhofer-Institut für Solare Energiesysteme ISE Freiburg, Germany

Session FB-5 - Excited State Enhanced Solar Cells

16.20 FB-5:IL02 Nanowires for Tandem Junction Solar Cells
M.T. BORGSTRÖM, Solid State Physics, Lund University, Lund, Sweden
Room: ASSISI B

Session FC-2 - Hydrogen Storage

Chair: Umit DEMIRCI, France

14.30  FC-2.2:IL06  Metal Borohydrides and Derivatives - Synthesis, Structure and Properties
T. R. JENSEN, INANO and Chemistry Department, Aarhus University, Aarhus, Denmark

15.00  FC-2.2:IL07  Nanoconfined Complex Metal Hydrides for Hydrogen and Ammonia Storage and Catalysis
P. NGENE, P. E. De JongH, Inorganic Chemistry and Catalysis, Debye Institute for Nanomaterials Science, Utrecht University, Netherlands

15.30  Break

16.00  FC-2.2:IL08  Physisorption in Porous Mg(BH4)2
Y. FILINCHUK, Institute of Condensed Matter and Nanosciences, Université Catholique de Louvain, Louvain-la-Neuve, Belgium

16.30  FC-2.5:IL02  Storage of Renewable Energy by Reduction of CO2 with Hydrogen
A. ZUETTEL, HEENA YANG, LMER, ISIC, SB, Ecole Polytechnique Fédérale de Lausanne (EPFL) Valais/Wallis, Energypolis, Sion, Switzerland, Empa Materials Science and Technology, Dübendorf, Switzerland
Room: NORCIA

Session FD-2 - Supercapacitors

Chair: Andrea BALDUCCI, Germany

14.30  **FD-2/I01**  Cost-effective and High-capacity Spinel Pseudo-capacitive Oxides
**NAE-LIH WU**, M. ABDOLLAHIFAR, Y.C. LIN, Department of Chemical Engineering, National Taiwan University, Taipei, Taiwan

15.10  **FD-2/I02**  Environmentally Friendly Materials for Supercapacitors
**A. VARZI**, S. PASSERINI, Karlsruhe Institute of Technology (KIT) - Helmholtz Institute Ulm (HIU), Ulm, Germany

15.50  **FD-2/L03**  3D-printing Electrodes for Electrical Energy Storage
**M. WORSLEY**, Lawrence Livermore National Laboratory, Livermore, CA, USA
Session FE-2 - Proton-conducting (PEFCs) and Alkaline (AFCs) Polymer Electrolyte Fuel Cells

Chair: Yu MORIMOTO, Japan

S. CHEREVKO, Forschungszentrum Jülich GmbH, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Erlangen, Germany

15.10 FE-2:L12 Remaining Challenges in Anion Exchange Membrane Fuel Cells
D.R. DEKEL, Technion - Israel Institute of Technology, Haifa, Israel
Session FF-2 - Novel Materials for High Efficiency Thermal-to-electrical Energy Conversion

Chair: Qiang LI, USA

14.30 FF-2:IL10 Solar Thermoelectric Materials Development
A. WEIDENKAFF, WENJIE XIE, XINGXING XIAO, University of Stuttgart, Stuttgart, Germany

15.10 FF-2:IL11 Structural Features and Transport Properties in Ternary and Quaternary Thermoelectric Sulfides
E. GUILMEAU1, C. BOURGES1, V. PAVAN KUMAR1, L. PARADIS-FORTIN1,2, P. LEMOINE2, O.I. LEBEDEV1, T. BARBIER1, B. RAVEAU1, B. MALAMAN1, G. LE CAER1, M. OHTA1, K. SUEKUNI11, A.R. SUJKA1, R. AL RAHAL AL ORAB1, M. FORNARI1, Lab. CRISMAT, Caen, France; 1Institut des Sciences Chimiques de Rennes (ISCR), Rennes, France; 1Institut Jean Lamour, Vandœuvre-lès-Nancy, France; 1Institut de Physique de Rennes (IPR), Rennes, France; 2Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2Dept. of Applied Science for Electronics and Materials, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Japan; 2Dept. of Physics and Science of Advanced Materials Program, Central Michigan University, USA

15.50 FF-2:IL12 Thermoelectric Properties of Mn2V(Al1-xSix) Full-Heusler Alloys
HEZHANG LI, KEI HAYASHI, YUZURU MIYAZAKI, Tohoku University, Sendai, Japan

16.20 Break

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

Chair: Victor I. KUZNETSOV, Russia

16.50 FF-3:IL05 Variation in Device Design for Low $/W and Flexible System
WOOCHEOL KIM, Yonsei University, Seoul, South Korea

17.30 FF-3:IL06 Importance of Electrical Impedance Matching on Efficiency and Power in Integrated Thermoelectric Generator Circuits
MARK LEE, Department of Physics, The University of Texas at Dallas, Richardson, TX, USA
Room: SPOLETO A

Session FG-3 - Magnetocaloric and Multifunctional Magnetic Materials

Chair: Simone FABBRI, Italy

14.30 FG-3:IL04 Materials with Giant Mechanocaloric Effects: Cooling by Strength
L. MANOSA, A. PLANES, Departament de Fisica de la Matèria Condensad, Universitat de Barcelona, Barcelona, Spain

15.00 FG-3:IL05 Structural Instabilities of Heusler Alloys
P. ENTEL, University Duisburg-Essen, Duisburg, Germany; V. SOKOLOVSKII, Chelyabinsk State University, Chelyabinsk, Russia

15.30 FG-3:IL06 Shell Magnetism in Heusler Compounds
M. ACET, A. CANIKI, 1Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; 2Department of Metallurgical and Materials Engineering, Mugla Siti Kocman University, Mugla, Turkey

16.00 Break

Chair: Mehmet ACET, Germany

16.30 FG-3:IL07 Ni-Mn-In Heusler Alloys Showing both Direct and Inverse Magnetocaloric Effect for Room Temperature Magnetic Refrigeration
S. FABBRI, MIST E-R scrf, Bologna, Italy; C. BENNATI, R. CABASSI, D. CALESTANI, F. ALBERTINI, IMEM-CNR, Parma, Italy; F. CUGINI, N. SARZI AMADE, M. SOLZI, SMFI Department, University of Parma, Parma, Italy; A. PEPICIELLO, C. VISONE, Engineering dep., University of Sannio, Benevento, Italy

16.50 FG-3:IL09 Kinetics of the Heat Flux Avalanches at the First Order Magnetic Transitions in Magnetocaloric Materials
V. BASSO, M. PIAZZI, C. BENNATI, Istituto Nazionale di Ricerca Metrologica, Torino, Italy; Università degli Studi di Pavia, Pavia, Italy; Istituto dei Materiali per l’Elettronica ed il Magnetismo - CNR, Parma, Italy
Room: SALA STAMPA

Session FH-2 - Understanding Fundamentals of Photo-induced Processes and Charge Transport

Chair: Jan AUGUSTYNSKI, Poland

14.30  FH-2:IL08  Studying Mobile Charge-Carriers in Photocatalytic Particles by Time Resolved Microwave Conductivity: Recent Developments
C. COLBEAU-JUSTIN, A. HERISSAN, A.L. LUNA BARRON, M.G. MENDEZ MEDRANO, H. REMITA, Laboratoire de Chimie Physique, CNRS UMR 8000, Université Paris-Sud, Université Paris-Saclay, Orsay, France

15.10  FH-2:IL11  Photocarrier Transport and Transfer in Emerging Transition Metal Oxide Photoelectrodes
I.D. SHARP1,2, J.K. COOPER1, CHANG-MING JIANG1, G. SEGEV1,
1Walter Schottky Institut and Physik Department, Technische Universität München, Garching, Germany; 2Joint Center for Artificial Photosynthesis and Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA
Room: BEVAGNA

Session FI-2 - Optoelectronic and Photonic Processes

Chair: Pierre LEFEBVRE, France

14.30 FI-2:IL07 Fabrication of high-quality AlN Template by High-temperature Annealing
HIDETO MIYAKE, SHIYU XIAO, YUSUKE HAYASHI, KANAKO SHOJIKI, Mie University, Tsu, Japan

15.10 FI-2:IL08 Simultaneous Tenfold Brightness Enhancement and Emitted-light Spectral Tunability in Transparent Ambipolar Organic Light-emitting Transistor by Integration of High-k Photonic Crystal
S. TOFFANIN, Istituto per lo Studio dei Materiali Nanostrutturati (ISMN), Consiglio Nazionale delle Ricerche (CNR), Bologna, Italy

15.50 Break

Chair: Hideto MIYAKE, Japan

16.20 FI-2:IL09 THz-QCLs toward High Output Power near Liquid Nitrogen Temperature Operation
TSUNG-TSE LIN, HIDEKI HIRAYAMA, Center for Advanced Photonics, RIKEN, Sendai, Japan

17.00 FI-2:L10 Omni-friendly Low Color Temperature OLED
JWO-HUEI JOU, M. SINGH, H.-F. LIN, Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan
Room: CASCIA

Session FJ-2 - Material Design and Device Development

Chair: John F. WAGER, USA

14.30  **FJ-2:IL12b** Transparent Diluted Magnetic and Plasmonic Metal Oxide Nanocrystals  
P.V. RADOVANOVIC, Department of Chemistry, University of Waterloo, Waterloo, ON, Canada

15.10  **FJ-2:IL13** Physical Properties and Applications of Doped BaSnO3 Semiconductors with High Electrical Mobility and Optical Transparency  
KEE Hoon KIM, Center for Novel States of Complex Materials Research and Institute of Applied Physics, Department of Physics and Astronomy, Seoul National University, Seoul, South Korea

15.50  **FJ-2:IL15** Photonic Processing for Metal Oxide Thin Films  
D.C. KOUTSOGEORGIS, Nottingham Trent University, Nottingham, UK

16.30  Break

Chair: Kee Hoon KIM, South Korea

17.00  **FJ-2:IL16** Interface Chemistry for Organic Electronics and Opto-electronics  
S.R. MARDER, School of Chemistry and Biochemistry, School of Materials Science and Engineering, and Center for Organic Photonics and Electronics, Georgia Institute of Technology, Atlanta, GA, USA

17.40  **FJ-2:IL17** In-Ga-Zn-O Thin Films with Tunable Optical and Electrical Properties Prepared by Reactive High-power Impulse Magnetron Sputtering  
J. REZEK, J. HOUSKA, M. PROCHAZKA, S. HAVIAR, Department of Physics and NTIS - European Centre of Excellence, University of West Bohemia, Plzen, Czech Republic
Room: SPOLETO B

Session FK-6 - Radiation Effects

Chair: Xavier DESCHANELS, France

14.30 FK-6:IL01 A Real Space Multiscale Model for the Deformation and Swelling of Components under High-energy Neutron Irradiation
S.L. DUDAREV1, 2, D.R. MASON1, E. TARLETON1, P.W. MA1,3, A.E. SAND1, 1UK Atomic Energy Authority, Oxfordshire, UK; 2Department of Materials, University of Oxford, Oxford, UK; 3Department of Engineering Science, University of Oxford, Oxford, UK; 4Department of Physics, University of Helsinki, Finland

15.00 FK-6:IL02 Hydrogen Isotope Retention in Neutron-irradiated Tungsten Exposed to High Flux Plasma
MASASHI SHIMADA, Idaho National Laboratory, Idaho Falls, ID, USA

15.30 FK-6:IL03 Pancake-like Growth and Coalescence of Intergranular Helium Bubbles: In situ Observation and Analytical Modelling
HEFEI HUANG1, JIE GAO1,2, XIANG LIU1, YAN LI1, 1Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai, China; 2School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China; 3Department of Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA

16.00 Break

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

Chair: Marek RUBEL, Sweden

16.30 FK-8:IL01 Low Activation Structural Materials for Nuclear Fission and Fusion Reactors - the RF R&D
V.M. CHERNOV, M.V. LEONTIEVA-SMIRNOVA, A.A. BOCHVAR, High-technology Research Institute of Inorganic Materials, Moscow, Russia

17.00 FK-8:IL02 Challenges of Simulating Neutron-induced Radiation Damage Using Ion Beams
G.S. WAS, University of Michigan, Ann Arbor, MI, USA
Room: MAGIONE A

Session FL-3 - Photonic Devices with Biological and Bio-inspired Materials

Chair: Yasuhiro ISHIDA, Japan

14.30 FL-3:IL06 Peptide Integrated Optics: From Optical Waveguides To Implantable BioChips
G. ROSENMAN, N. LAPSHINA, School of Electrical Engineering, Faculty of Engineering, Tel Aviv University, Israel; B. APTE, A. HANDEMAN, Faculty of Engineering, Holon Institute of Technology, Holon, Israel

15.10 FL-3:IL07 Circular Polarization Reflections from Beetles - What do they tell us?
K. WEIR, Blackett Laboratory, Department of Physics, Imperial College London, London, UK

15.50 Break

Chair: Gil ROSENMAN, Israel

16.20 FL-3:IL08 Lasers and Optical Cavities Made out of Biological Materials
M. HUMAR, J. Stefan Institute, Ljubljana, Slovenia; and Faculty of Mathematics and Physics, University of Ljubljana, Ljubljana, Slovenia

17.00 FL-3:IL09 Up-scaling of Bio-inspired Polymer Films for Optical Applications
F. VULLERS, S. SCHAUER, J. SYURIK, M. KAVALENKA, H. HÖLSCHER, Karlsruhe Institute of Technology, Karlsruhe, Germany
Session FM-2 - Resistance Switching (RRAM) and Phase Change (PCM) Memories

Chair: Abu SEBASTIAN, Switzerland

14.30 FM-2:IL15 Exploiting Nanoscale Effects in Phase Change Memories
M. SALINGA, RWTH Aachen University, Aachen, Germany

15.00 FM-2:IL16 Ovonic Threshold Switching Selector: From Material Engineering to Device Performance Improvement

15.30 FM-2:IL17 Atomistic Simulations of Crystallization and Aging of GeTe Nanowires

16.00 FM-2:IL19 Van der Waals Gap Reconfiguration and Switching Mechanism in Ge-Sb-Te Superlattices
A.V. KOLOBOV, P. FONS, Y. SAITO, J. TOMINAGA, Nanoelectronics Research Institute, National Institute of Advanced Industrial Science & Technology, Tsukuba Central 5, Tsukuba, Ibaraki, Japan

16.30 Break

Chair: Ilia VALOV, Germany

16.50 FM-2:IL20 Unipolar Resistive Switching in Pt/MgO/TaOx/Ta/Ru Thin Films
C. DIAS, L.M. GUERRA, B.D. BORDALO, J. VENTURA, IFIMUP-IN and Dept. of Physics and Astronomy, Faculty of Sciences, Porto, Portugal; HUA LV, S. CARDOSO, PP FREITAS, INESC-MN and IN - Institute of Nanoscience and Nanotechnology, Lisboa, Portugal; A.M. FERRARIA, A.M. BOTELHO DO REGO, Centro de Química-Física Molecular and IN, IST, Universidade de Lisboa, Lisboa, Portugal

17.10 FM-2:IL21 Epitaxial Stabilization of Single Crystalline Semiconductor and Metallic NbO2

17.30 FM-2:IL22 Magnetism as a Probe of the Origin of Memristive Switching in Oxide Semiconductors
X.L. WANG, A. RUOTOLO, Dept. of Materials Science and Eng., City University of Hong Kong, Kowloon, Hong Kong SAR, China

Session FM-3 - Emerging Applications for Non-volatile Memories

17.50 FM-3:IL14 Memory Systems in Biology Modeled by Analog Electronics
R. DANIEL, Biomedical Engineering Dept., Israel Institute of Technology (Technion), Israel
Room: ORVIETO B

Session FN-2 - Structural Characterization

Chair: Ovidiu ERSEN, France

14.30 **FN-2:IL04** Small Angle Neutron Scattering for Characterization of Carbon Nanostructures

V.T. LEBEDEV, Saint-Petersburg Nuclear Physics Institute, National Research Center “Kurchatov Institute”, Saint-Petersburg, Russia

15.00 **FN-2:IL05** Interface and Properties of Nanocrystalline CVD diamond on AlGaN/GaN Heterostructures

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

15.30 **FN-2:IL06** Potential Environmental Impact of Carbon Nano-materials

E. FLAHAUT, L. LAGIER, L. EVARISTE, A. MOTTIER, F. MOUCHET, P. LONCHAMBON, G. CHIMOWA, B. SOULA, A.-M. GALIBERT, E. PINELLP, L. GAUTHIER, ‘CIRIMAT, Interuniversity Engineering and Research Centre on Materials UMR CNRS-UPS-INPT N°5085, Toulouse, France; ‘ECOLAB, University of Toulouse, CNRS, INPT, UPS, Castanet-Tolosan, France

16.00 **FN-2:IL07** Measurement of Graphene/Metal Contact Resistance using Kelvin Probe Force Microscopy

W. MERTIN, G. BACHER, Universität Duisburg-Essen, Werkstoffe der Elektrotechnik and CENIDE, Duisburg, Germany; C. ALVARADO CHAVARIN, present address: Innovations for High Performance Microelectronics IHP GmbH, Frankfurt (Oder), Germany

16.30 **FN-2:IL08** Laser-induced Breakdown Spectroscopy: A Perspective Method for Nanocarbon Materials Characterization

V.F. LEBEDEV, N.V. NIKONOROV, ITMO University, Saint-Petersburg, Russia; M.K. RABCHINSKII, A.V. SHVIDCHENKO, A.Ya. VUL, Ioffe Institute, St. Petersburg, Russia

16.50 Break

Session FN-4 - Applications

Chair: Maurizio PRATO, Italy

17.10 **FN-4:IL05** Carbon Nano-onions as Nanoprobe for Cancer Therapy

S. GIORDANI, DepartmeNT OF CHEMISTRY, UNIVERSITÀ DI TORINO, TURIN, ITALY, AND NANO CARBON MATERIALS, Istituto Italiano di Tecnologia, Turin, Italy

17.40 **FN-4:IL06** Side-gated Nanoscale Diamond Transistors

A.C. PAKPOUR-TABRIZI, R.B. JACKMAN, London Centre for Nanotechnology and the Department of Electronic and Electrical Engineering, University College London, London, UK
Session FO-4 - Theory and Mechanisms

Chair: Ryotaro ARITA, Japan

14.30 FO-4:IL06 Robust Dynamical Charge Density Waves in High-Tc Superconducting Cuprates
M. GRILLI, Dipartimento di Fisica, Università di Roma “Sapienza”, Rome, Italy

15.00 FO-4:IL07 Fermi Surface Reconstruction in the Pseudogap State
J. STOREY, Robinson Research Institute, Victoria University of Wellington, Wellington, New Zealand

15.30 Break

Session FO-6 - Synthesis and Processing

16.00 FO-6:IL01 Growth and Properties of Novel Superconducting Materials
G. LOGVENOV, GIDEOK KIM, Max Planck Institute for Solid State Research, Stuttgart, Germany
Room: MAGIONE B

Session FP-3 - New Therapeutics and Intelligent Drug/Biomolecule/Gene Delivery Systems

Chair: Atsushi TAMURA, Japan

14.30 FP-3:IL03 Intracellular Delivery of Nanocarriers and Targeting to Subcellular Organelles
V. TORCHILIN, Center for Pharmaceutical Biotechnology and Nanomedicine, Northeastern University, Boston, MA, USA

15.00 FP-3:IL05 Targeted and Controlled Delivery of an Anti-tumor Chelator to Brain Cancer Cells
S. MAJD, University of Houston, Houston, TX, USA

15.30 Break

Chair: Sheereen MAJD, USA

16.00 FP-3:IL04 “Borono-lectin” Engineering as a Versatile Platform for Intelligent Drug Delivery Systems
AKIRA MATSUMOTO, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan

Session FP-5 - Clinical Translations in Diagnosis and Therapy, and in Implantable Prostheses and Micro-nano Devices

16.30 FP-5:IL01 Advanced Nanobiomaterials for Neural Interfaces
M.R. ABIDIAN, Biomedical Engineering, University of Houston, Houston, TX, USA
Room: CORCIANO

Session FA-3 - Applications of Flexible/Stretchable Electronics

Chair: Martin KALTENBRUNNER, Austria

9.30  FA-3:IL08  Temporary Tattoo Ink-jet Printed Multi-Electrode Array for Electrophysiology Applications
       F. GRECO, Institute of Solid State Physics, Graz University of Technology, Austria

10.10 FA-3:L09  The Glass Transition Temperature as a Means of Kinesthetic Feedback
       C.W. CARPENTER, SIEW TING M. TAN, D. RODRIQUEZ, K. SKEIL, D.J. LIPOMI, University of California, San Diego, Dept. of Nanoengineering, South Pasadena, CA, USA

10.40  Break

Chair: Mario CAIRONI, Italy

11.10 FA-3:IL10  Wearable Electronic System Based on Stretchable Carbon Nanotube Electronics and Ultrathin Organic Light Emitting Diodes
       JA HOON KOO$^{1,2}$, DAE-HYEONG KIM$^{1,2,3}$, "Center for Nanoparticle Research, Institute for Basic Science (IBS), Seoul, South Korea; $^{2}$Interdisciplinary Program for Bioengineering, Seoul National University, Seoul, South Korea; $^{3}$School of Chemical and Biological Engineering, Institute of Chemical Processes, Seoul National University, Seoul, South Korea

11.50 FA-3:IL11  Soft and Inert Composites and Devices for Neural Interfaces
       K. TYBRANDT, Laboratory of Organic Electronics, Linköping University, Norrköping, Sweden
Room: ASSISI A

Session FB-6.2 - Theoretical Modelling of Materials and Devices

Chair: Trystan WATSON, UK

9.30 FB-6.2:IL01 Device Physics of Perovskite Solar Cells
W. TRESS, EPFL, Lausanne, Switzerland

10.00 FB-6.2:IL02 Charge Carrier Diffusion and Trapping Models in Lead Halide Perovskites
HIROKI URATANI, KOICHI YAMASHITA, Department of Chemical System Engineering, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan

10.30 Break

Chair: Tsutomu MIYASAKA, Japan

Session FB-6.4 - Design of Lead-free New Materials

11.00 FB-6.4:IL01 Enhancement of Sn-perovskite Solar Cells from View Point of hetero-interface Design and Crystal Defect Density
SHUZI HAYASE, Kyushu National Institute of Technology, Kitakyushu, Japan

11.30 FB-6.4:IL02 Bismuth and Antimony-based Lead Free Double Perovskites in Solar Cells
M. PANTALER, C. FETTKENHAUER, I. ANUSCA, D.C. LUPASCU, Institute for Materials Science, University of Duisburg-Essen, Essen, Germany

Session FB-6.5 - Scale up, Module Development and Measurement Protocols

11.50 FB-6.5:IL01 Carbon Perovskite Solar Cells from Laboratory to Factory
T. WATSON, SPECIFIC Swansea University, Swansea, UK

12.20 FB-6.5:IL04 Development of Pb-free Perovskites and their Application for Solar Cells
CHU ZHANG1, LIGUO GAO2, SHUZI HAYASE1, TINGLI MA1,2, 1Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology, Kitakyushu, Fukuoka, Japan; 2School Petroleum and Chemical Engineering, Dalian University of Technology, Panjin Campus, Pan-jin, Liaoning, China
Session FC-2 - Hydrogen Storage

Chair: Michael HIRSCHER, Germany

9.30 FC-2.1:IL04 Influence of Composition and Stoichiometry on the Hydrogenation Properties of Phase Intergrowth Alloys M. LATROCHE, N. MADERN, J. MONNIER, JUNXIAN ZHANG, Université Paris Est, ICMPE, CNRS-UPEC, Thiais, France

10.00 FC-2.1:L05 Microstructure and Hydrogen Storage Properties of Ti1V0.9Cr1.1 alloy with addition of x wt.% Zr (x = 0, 2, 4, 8 and 12) S. SLEIMAN, J. HUOT, Hydrogen Research Institute, Université du Québec à Trois-Rivières, Trois-Rivières, Québec, Canada

10.20 FC-2.1:L06 Mg2FeH6 for Hydrogen Storage and Lithium Batteries A. PAOLONI, O. PALUMBO, CNR-ISC, U.O.S. La Sapienza, Roma, Italy; F. TREQUATRINI, Dipartimento di Fisica, Sapienza Università di Roma, Roma, Italy; P. REALE, ENEA - Centro Ricerche Casaccia, Roma, Italy; S. BRUTTI, Dipartimento di Scienze, Università della Basilicata, Potenza, Italy

10.40 Break

Chair: Andreas ZUETTEL, Switzerland

11.10 FC-2.4:IL01 H2 Sorption in Composite Materials Based on Metal-organic Hybrid Frameworks P.A. SZILAGYI, Queen Mary University of London, London, UK

11.40 FC-2.4:IL03 Gravimetric and Volumetric Hydrogen Storage Capacity in Metal-organic Frameworks M. HIRSCHER, M. SCHLICHTEMAYER, R. BALDERAS-XICOHTENCATL, Max Planck Institute for Intelligent Systems, Stuttgart, Germany

12.10 FC-2.7:L03 Nanocluster-based Hydrogen Gas Sensors (CuO/WO3) Prepared by Advanced Magnetron Sputtering Techniques S. HAVIAR, J. CAPEK, University of West Bohemia, Faculty of Applied Sciences, NTIS and Department of Physics, Plzen, Czech Republic
Room: NORCIA

Chair: Arumugam MANTHIRAM, USA

Session FD-2 - Supercapacitors

10.00 FD-2:IL05 Novel Electrolytes for Supercapacitors
A. BALDUCCI, L. HENNING HESS, C. SCHÜTTER, J. KRUMMacher, Friedrich-Schiller-University Jena, Institute for Technical Chemistry and Environmental Chemistry, Center for Energy and Environmental Chemistry, Jena (CEEC Jena), Jena, Germany

Session FD-3 - Application Engineering

10.40 FD-3:IL02 Materials Engineering Challenges for Viable Li-S Battery Electrodes and Cells
S. TRABESINGER, Electrochemistry Laboratory, Paul Scherrer Institute, Villigen PSI, Switzerland

11.20 FD-3:IL03 Economic and Ecological Sustainability Analysis of Batteries for Stationary Applications
M. WEIL, M. BAUMANN, KIT/ITAS, Karlsruhe, Germany; J. PETERS, KIT/HIU, Ulm, Germany
Room: SPELLO

Session FE-3 - Direct Alcohol Fuel Cells (DAFCs)

Chair: Maria V. MARTINEZ-HUERTA, Spain

9.00 FE-3:L01 Ru-modified Carbons by Organometallic Functionalization as Support for Nanostructured Pt: High Performance Pt-Ru Catalysts for the Oxidation of Methanol and Ethanol in Alkaline Media
E. CANDIA-GARCIA1, J.A. DIAZ-GUILLEN1, J.C. MARTINEZ-LOYOLA1, A.A. SILLER-CENICEROS1, M.E. SANCHEZ-CASTRO1, M. SANCHEZ-VAZQUEZ1, B. ESCOBAR-MORALES1, I.L. ALONSO-LEMU2, F.J. RODRIGUEZ-VAREL2,1 Instituto Tecnológico de Saltillo, Saltillo, Coahuila, Mexico; 2Universidad Tecnológica de Coahuila, Ramos Arizpe, Coahuila, Mexico; 3Centro de Investigación de los Recursos Naturales y Energía, Cinvestav Unidad Saltillo, Ramos Arizpe, Coahuila, Mexico; 4CONACYT, Centro de Investigación Científica de Yucatán, Mérida, Yucatán, Mexico; CONACYT, Sustentabilidad de los Recursos Naturales y Energía, Cinvestav Unidad Saltillo, México

9.30 FE-3:L02 Synthesis and Characterization of Co-N-C and Fe-N-C for Application as Methanol Tolerant Catalysts in DMFCs
C. LO VECCHIO, G. MONFORTE, A.S. ARICO, V. BAGLIO, Istituto di Tecnologie Avanzate per l’Energia “Nicola Giordano” (ITAE-CNPI), Messina, Italy

10.00 FE-3:L03 Activity and Degradation Study of a Fe-N-C Catalyst for ORR in Direct Methanol Fuel Cell (DMFC)
I. MARTINAIOU1,2, A.H.A. MONTEVERDE VIDELA3, S. SPECCHIA2, U.I. KRAMM1,2, TU Darmstadt, Catalysts and Electro catalysts, Dept. of Materials- and Earth Science and Dept. of Chemistry, Darmstadt, Germany; 2Graduate School of Excellence Energy Science and Engineering, Darmstadt, Germany; 3Politecnico di Torino, Dip. Scienza Applicata e Tecnologia, Torino, Italy

10.30 Break

Chair: Vincenzo BAGLIO, Italy

11.00 FE-3:L04 Electro catalyst Supports for Direct Methanol Fuel Cells
M.V. MARTINEZ-HUERTA, Institute of Catalysis and Petrochemistry, CSIC, Madrid, Spain

11.40 FE-3:L05 Understanding Water and Methanol Transport Properties in Ionomers and Composite Membranes Based on Non-fluorinated Polymers for Fuel Cell Applications
I. NICOTERA, C. SIMARI, Dept. of Chemistry and Chemical Technology, University of Calabria, Rende (CS), Italy; A. ENOTIADIS, National Center for Scientific Research “Demokritos”, Athens, Greece
Session FF-2 - Novel Materials for High Efficiency Thermal-to-electrical Energy Conversion

Chair: Maarit KARPPINEN, Finland

9.00 FF-2/IL05 Highly Efficient Silicides Based Thermoelectric Materials
   T. KYRATSI. Department of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus

9.40 FF-2/IL06 Transport Properties of Homologous Compounds (PbSe)5(Bi2Se3)m (m = 1, 2 and 3)
   S. SASSI, C. CANDOLFI, A. DAUSCHER, B. LENOIR, Institut Jean Lamour, UMR 7198 CNRS, Université de Lorraine, Campus Artem, Nancy Cedex, France

10.20 FF-2/IL07 Renewed Interest for Heusler and Half-Heusler Alloys for Thermoelectric Applications
   E. BAUER, B. HINTERLEITNER, I. KNAPP, A. GRYTSIV, Technische Universität Wien, Institute of Solid State Physics, Vienna, Austria; P. ROGL, G. ROGL, University of Vienna, Institute of Material Chemistry; A. TAVASSOLI, University of Vienna, Institute of Material Chemistry and C. Doppler Laboratory for Thermoelectricity, Vienna, Austria

11.00 Break

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

Chair: Ryoji FUNAHASHI, Japan

11.30 FF-3/IL02 Ultra High Temperature Thermophotovoltaic Technology Combined with Thermionic Energy Conversion

12.10 FF-3/IL09 Thermoelectric Power Generation from Nanostructured PbTe and Colusite: Materials and Modules
   MICHIHIRO OHTA, P. JOOD, ATSUSHI YAMAMOTO, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan; KOICHIRO SUEKUNI, Kyushu University, Kasuga, Fukuoka, Japan; M.G. KANATZIDIS, Northwestern University, Evanston, Illinois, USA, and Argonne National Laboratory, Argonne, Illinois, USA
Room: SPOLETO A

Session FG-3 - Magnetocaloric and Multifunctional Magnetic Materials

Chair: Lluis MANOSA, Spain

9.30 FG-3:IL10 Efficient Energy-conversion near Room-temperature with Transition Metal Based Magnetic Materials
E. BRUECK, N. VAN DIJK, Fundamental Aspects of Materials and Energy, Faculty of Science, TU Delft, Delft, Netherlands

10.00 FG-3:IL11 Magnetocaloric Performance of La(FeSi)13 Compounds
L.E. COHEN, Imperial College London, London, UK

10.30 FG-3:IL12 Molecular Spin Crossover Crystals as Barocalorics
S. VALLONE1,2, A.M. DOS SANTOS3, J. MOLaison4, M. HALCROW4, K. SANDEMAN1,2, 1The Graduate Center of The City University of New York, USA; 2Brooklyn College of The City University of New York, USA; 3Oak Ridge National Laboratory, USA; 4University of Leeds, USA

11.00 Break

Chair: Lesley COHEN, UK

11.30 FG-3:IL13 Manipulating Magnetic Frustration for Caloric Effects
J.B. STAUNTON, E. MENDIVE-TAPIA, Department of Physics, University of Warwick, Coventry, UK

12.00 FG-3:IL14 Tuning Magnetism and Functional Properties in Ferromagnetic Shape Memory Films and Nanodisks
F. CASOLI, M. TAKHSHA GHAHFAROKH, L. NASI, R. CABASSI, F. ALBERTINI, IMEM - CNR, Parma, Italy; S. FABBIRICI, MIST E-R Laboratory, Bologna, Italy; F. CELEGATO, G. BARRERA, P. TIBERTO, INRIM, Torino, Italy; M. CAMPANINI, EMPA, Dübendorf, Switzerland; C. MAGEN, Instituto de Nanociencia de Aragón, Zaragoza, Spain; V. GRILLO, NANO - CNR, Modena, Italy
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Room: SALA STAMPA

Session FH-3 - Design Approaches for Advanced Applications

Chair: Ib CHORKENDORFF, Denmark

9.00  FH-3:IL03  Transient Phenomena in Photocatalysis, as Studied by Ultrafast FTIR Measurements
Y. PAZ, I. BENISTI, A. BEN REFAEL, Department of Chemical Engineering, Technion, Haifa, Israel

M.C. ARIZA-TARAZONA, J.F. VILLAREAL-CHIU, Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., Mexico; C. MUGONI, V. BARBIERI, C. SILIGARDI, Università degli Studi di Modena e Reggio Emilia, Dipartimento di Ingegneria “Enzo Ferrari”, Modena, Italy; E.I. CEDILLO-GONZÁLEZ, Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., Mexico

10.10 FH-3:L05  Optical Emission from Catalytic Combustion of MeOH/air on Yb2O3 Supported Metal Catalysts
J. TERRENI1,2, A. WENGER1, R. HOLZNER1, A. BORGSCHULTE1,2, 1Laboratory of Advanced Analytical Technologies, Empa, Dübendorf, Switzerland; 2University Zürich, Department of Chemistry, Zürich, Switzerland; 3Ekonimo-Drive AG, Cham, Switzerland

10.40  Break

Chair: Gabriele CENTI, Italy

11.10 FH-3:IL06  Modelling of Solar Water Splitting Devices
S. HAUSSENER, Laboratory of Renewable Energy Science and Engineering, EPFL, Switzerland

11.50 FH-3:L07  Coupling Peroxidase Enzymes with Photocatalytic Hydrogen Peroxide Production
B.O. BUEREK, J.Z. BLOH, DECHEMA-Forschungsinstitut, Frankfurt, Germany; D.W. BAHNEMANN, Leibniz Universität Hannover, Germany
Room: BEVAGNA

Session FI-3 - Electro-optical-structural Characterization

Chair: Motoaki IWAYA, Japan

9.30  FI-3:IL01  Light-emitting Electrochemical Cells: Towards Low-cost Fabrication and High-efficiency Operation
L. EDMAN, The Organic Photonics and Electronics Group, Umeå University, Umeå, Sweden

10.10  FI-3:L02  Charge Injection Investigation at the Interface between Metal Contact and Active layer in Organic Field-effect Transistors
M. NATALI, S.D. QUIROGA, A. LONGO, E. BENVENUTI, F. MERCURI, F. PRESCIMONE, S. TOFFANIN, ISMN-CNR, Bologna, Italy; M. BUONOMO, N. LAGO, A. CESTER, UniPd, Padova, Italy

10.40  Break

11.10  FI-3:IL04  Inorganic Perovskite Crystals for Fast Color-conversion Applications
N. LAURAND, Institute of Photonics, Dept. of Physics, SUPA, University of Strathclyde, Glasgow, UK
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Room: CASCIA

Session FJ-2 - Material Design and Device Development
Chair: Daniel NEUMAIER, Germany

9.00  FJ-2:IL18  Growth and Properties of Ga2O3 Thin Films
R. FORNARI1,2, A. BARALDI1, V. MONTEDORO1, A. PARISINI1, M. PAVESI1, M. BOSI2, C. FERRARI2, E. GOMBIA2, D. KLIMM2, F. MEZZADRI3, G. CALESTANINI, I. CORA3, B. PEČZ4, 1Dept. of Mathematical, Physical and Computer Sciences, University of Parma, Parma, Italy; 2Institute of Electronic and Magnetic Materials (IMEM-CNR), Parma, Italy; 3Leibniz Institute for Crystal Growth (IKZ), Berlin, Germany; 4Dept. of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, Italy; 5Centre for Energy Research, Hungarian Academy of Sciences, Institute for Technical Physics and Materials Science, Budapest, Hungary

9.40  FJ-2:IL19  Photosensitive TCO-based Hybrid Materials for Gas Sensor Applications
M.N. RUMYANTSEVA1, A.F. NASRIDDINOV, E.V. PAKHOVA, E.V. LUKOVSKAYA, O.A. FEDOROVA, A.M. GASOKOV, Moscow State University, Moscow, Russia

10.20  FJ-2:L20  Use of Electrografted Aryl-layers to Control the Conductivity of ZnO Surfaces
A.R. McNEILL, A.J. DOWNDWARD, M.W. ALLEN, University of Canterbury, New Zealand

10.50  FJ-2:L21  Reactive Dip-coating of Rhombohedral Delafossite CuAlO2 Based on Mesoporous Alumina Nanofibers
A. SAFFAR SHAMSHIRGAR1, M. AGHAYAN1, T.S. TRIPATHI2, M. KARPPINEN3, M. GASIK1, I. HUSSAINOVA1, 1Dept. of Mechanical and Industrial Engineering, Tallinn University of Technology, Estonia; 2Dept. of Chemistry, Aalto University, Aalto, Finland; 3School of Chemistry, Material Science and Engineering, AALTO University, Aalto, Finland; 4ITMO University, St. Petersburg, Russia

11.20  Break

Session FJ-3 - Applications
Chair: Roberto FORNARI, Italy

11.50  FJ-3:IL01  Phonon Engineering on In2O3- and ZnO-based Thin Films
JUNJUN JIA, YUZO SHIGESATO, GRADUATE SCHOOL OF SCIENCE AND ENGINEERING, Aoyama Gakuin University, Sagamihara, Kanagawa, Japan

12.30  FJ-3:L02  Solution Synthesized Delafossite Nanoparticles for Hole Transport Layer in Organic and Perovskite Solar Cells
T.B. DAUNIS, JIAN WANG, BOYA ZHANG, D. BARRERA, JULIA W.P. HSU, University of Texas at Dallas, Richardson, TX, USA; W. DUNLAP-SHOHL, D. MITZI, Duke University, USA
Session FK-6 - Radiation Effects

**Chair**: Sergei DUDAREV, UK

**9.00 FK-6:IL05** New Conceptual Advances in Diffusion-mediated Modelling of Dislocation-driven Evolution of Radiation Effects in Fission and Fusion Materials

I. ROVELLI\(^1\), A.P. SUTTON\(^3\), S.L. DUDAREV\(^2\), \(^1\)Department of Physics, Imperial College London, London, UK; \(^2\)Culham Centre for Fusion Energy, UK Atomic Energy Authority, UK

**9.30 FK-6:IL06** In situ Ion Irradiation Induced Detwinning in Naotwinned Cu Films

ENGANG FU\(^1\), J.L. DU\(^1\), K.Y. YU\(^2\), M.M. LI\(^3\), M. KIRK\(^3\), \(^1\)School of Physics, Peking University, Beijing, China; \(^2\)Dept. of Materials Science, Chinese University of Petroleum, Beijing, China; \(^3\)Argonne National Laboratory, Argonne, IL, USA

**10.00 FK-6:L08** Behaviour of Spent Nuclear Fuel during Long-term Storage: Accelerated Radiation Damage with 238Pu-doped UO2

E. DE BONA, M. COLOGNA, T. WISS, R.J.M. KONINGS, JRC-Karlsruhe, Eggenstein-Leopoldshafen, Karlsruhe, Germany; G. BALDINOZZI, CentraleSupélec, Gif-sur-Yvette, Paris, France

**10.20 FK-6:L09** Are Mesoporous Silica Radiation Tolerant?

X. DESCHANIELS, Y. LOU, S. DOURDAIN, C. REY, ICSM-UMR5257, CEA/CNRS/UM/ENSCM, Bagnols-sur-Cèze, France

**10.40 Break**

**Chair**: Masashi SHIMADA, USA

**11.10 FK-6:IL10** Effect of Irradiation Defects on SiC Dissolution in Hot Water

YUKI MAEDA, KAZUHIRO FUJIKI, SHINICHIRO MOURI, TATSUYA HINOKI, Kyoto University, Uji, Kyoto, Japan

**11.40 FK-6:L12** Helium Precipitation Study in UO2 by Transmission Electron Microscopy

A. MICHEL, G. CARLOT, C. SABATHIE, CEA / DEN / DEC, Saint Paul Lez Durance, France; M. DUMONT, IM2NP UMR CNRS 7334, Aix-Marseille Université, Marseille, France; M. CABIE, CP2M, Aix-Marseille Université, Marseille, France

**12.00 FK-6:L13** Degradation of Zr Microstructure under Operation as Part of Fuel Assemblies of VVER-type Reactors

B.A. GUROVICH, E.A. KULESHOVA, A.S. FROLOV, D.A. MALTSEV, D.A. ZHURKO, D.V. SAFONOV, E.V. KRIKUN, NRC KI, Moscow, Russia

**12.20 FK-6:L14** Electronic Structure Calculations of Structural, Electronic, Thermodynamic and Defect Properties in Mixed Uranium-plutonium Oxides (U,Pu)O2

I.C. NJIFON, M. FREYSS, R. HAYN, M. BERTOLUS, 'CEA, DEN, DEC, de Cadarache, Saint-Paul-Lez-Durance, France; 'Aix-Marseille Université, IM2NP, Campus Scientifique Saint-Jérôme, Marseille Cedex, France
THURSDAY JUNE 14 MORNING

Room: MAGIONE A

Session FL-3 - Photonic Devices with Biological and Bio-inspired Materials

Chair: Mathias KOLLE, USA

9.00  FL-3:IL10  Structural Colours in Plants: Mechanisms and Functions
S. VIGNOLINI, Department of Chemistry, University of Cambridge, Cambridge, UK

9.40  FL-3:IL11  Bioabsorbable Polymer Optical Waveguides for Deep-tissue Photomedicine
S. NIZAMOGLU, Koc University, Istanbul, Turkey

10.20  Break

Session FL-4 - Bio-medical Devices with Biological and Bio-inspired Materials

Chair: Sahika İNAL, Saudi Arabia

10.50  FL-4:IL01  Optoelectronic Cellular Interfaces with Nanocrystalline Organic Semiconductors
E.D. GLOWACKI, V. DEREK, Laboratory of Organic Electronics, Physics and Electronics Division, Linköping University, Norrköping, Sweden

11.30  FL-4:IL02  Photostimulation of Semiconducting Nanoparticles to Control Physiological Functions In Vivo
M. MOROS1, M.R. ANTOGNAZZA2, C. BOSSIO2, G. ONORATO1, A. BAUDUIN1, V. MARCHESANO1, M. ZANGOLI3, A. TINO1, G. LANZANI3, C. TORTIGLIONE1, 1Istituto di Scienze Applicate e Sistemi Intelligenti “E.Caianiello”, CNR, Pozzuoli, Italy; 2Center for Nano Science and Technology@PoliMi, Istituto Italiano di Tecnologia, Italy; 3Istituto per la Sintesi Organica e la Fotoreattività, CNR, Italy

12.10  FL-4:IL03  Bioengineering Fluorescent Conductive Microfibrils in Vivo
M. MOROS1,2, F. DI MARIA3, P. DARDANO4, M. ZANGOLI3, G. ONORATO1, A. BAUDUIN1, A. TINO1, L. DESTEMFANO4, G. BARBARELLA3, C. TORTIGLIONE2, 1Aragon Materials Science Institute, CSIC, Zaragoza, Spain; 2Istituto di Scienze Applicate e Sistemi Intelligenti “E.Caianiello”, CNR, Napoli, Italy; 3Istituto per la Sintesi Organica e la Fotoreattività, CNR, Bologna, Italy; 4Istituto di Microelettronica e Microsistemi, CNR, Napoli, Italy
Room: ORVIETO A

Session FM-2 - Resistance Switching (RRAM) and Phase Change (PCM) Memories

Chair: Sabina SPIGA, Italy

9.00 FM-2:IL23 Random Telegraph Noise in Resistive Switching Memory Devices
   F.M. PUGLISI, University of Modena and Reggio Emilia, Modena, Italy

9.30 FM-2:IL24 Characterization of Low Frequency Noise in Oxygen Engineered Hafnium Oxide-based RRAM Devices
   E. PIROS¹, M. LONSKY², S. PETZOLD¹, S.U. SHARATH¹, E. HILDEBRANDT¹, B. KRAH¹, J. MULLER², L. ALFF³, ¹Technische Universität Darmstadt, Darmstadt, Germany; ²Goethe-Universität Frankfurt, Germany

9.50 FM-2:IL25 Anionic and Protonic Carriers for Oxide-based Neuromorphic Computing
   J.L.M. RUPP, Electrochemical Materials, Massachusetts Institute of Technology, MIT, USA

10.20 Break

Session FM-1 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

Chair: Helene BEA, France

10.50 FM-1:IL10 Negative Capacitance: Theory, Practice and Limitations
   Y.J. KIM, M.H. PARK, CHEOL SEONG HWANG, Department of Material Science & Engineering and Inter-University Semiconductor Research Center, Seoul National University, Seoul, South Korea

11.20 FM-1:L02 Magnetoelectric Coupling at Ferromagnet/Ferroelectric-hfO₂ Interface
   A. ZENKEVICH¹, Y. MATVEYEV¹, V. MIKHEEV², R. MANTOVAN², A.I. CHUMAKOV³, ¹Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia; ²CNR-IMM Laboratorio MDM, A grate Brianza (MB), Italy; ³ESRF-The European Synchrotron CS40220, Grenoble Codex, France

11.40 FM-1:L03 Effect of Polarization Reversal on the Potential Distribution Across Ferroelectric HfO₂ based Capacitors Revealed in Operando by Hard x-ray Photoemission Spectroscopy
   Y. MATVEYEV¹, D. NEGROV¹, V. MIKHEEV², A. CHERNIKOVA³, A. ZENKEVICH¹, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia; A. GLOSKOVSKI2, Deutches Elektronen-Synchrotron, Hamburg, Germany

12.00 FM-1:IL05 Ultrafast MRAM Strategies for Cache Applications and Beyond
   I.I. PREJBEANU¹, A. TIMOPHEEV², M. MIRON², G. GAUDIN², B. LACOSTE², T. DEVOLDER², M. MARINSDECASTRO², R.C. SOUSA³, L.D. BUDA-PREJBEANU⁴, S. AUFFRET⁴, E. EBELS², B. RODMACO², B. DIENY⁴, ¹Univ. Grenoble Alpes, CEA, CNRS, INAC-Spitenc, Grenoble, France; ²Univ. Paris-Sud, Orsay, France

12.30 FM-1:L06 Sub-ns Current-induced Magnetization Switching Driven by Spin-orbit Torques
   P. GAMBARDELLA, Dept. of Materials, ETH Zürich, Switzerland
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Room: ORVIETO B

Session FN-4 - Applications

Chair: Sanna ARPIAINEN, Finland

9.00  FN-4:IL07  Optimization of Gate Oxide for Reliable Diamond Power Transistors
E. GEERAERT, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France

9.30  FN-4:IL08  Graphene-based Micro-supercapacitors by Flash Lamp Technology
TAEYOUNG KIM, Department of Bionanotechnology, Gachon University, Seongnam, South Korea

10.00 FN-4:IL09  Carbon Nanofibers as Support for Pt-Catalysts in PEM Fuel Cells
P.Y. PODLESCHNY, U. ROST, M. BRODMANN, Westphalian University of Applied Sciences, Dortmund, Germany

10.30 FN-4:IL10  Beyond CMOS Solutions Enabled by Layered Materials
G. FIORI, Dipartimento Ingegneria dell’Informazione, University of Pisa, Pisa, Italy

11.00  Break

Chair: TaeYoung KIM, South Korea

11.30 FN-4:IL12  Applications of Detonation Nanodiamonds: Today and in Future
A.T. DIDEIKIN, Ioffe Institute, St. Petersburg, Russia

12.00 FN-4:IL14  Black Diamond Technology for Solar Energy Conversion
A. BELLUCCI1, M. GIROLAMI1, M. MASTELLONE1, S. ORLANDO1, R. POLINI1,2, D.M. TRUCCHI1, 2CNR-ISM, Rome, Italy; 2Dept. of Chemical Sciences and Technologies, Univ. di Roma “Tor Vergata”, Rome, Italy

12.20 FN-4:IL15  Redox andMagnetically Active Nanoswitches Encapsulated in Hollow Carbon Nanotubes
M. DEL CARMEN GIMENEZ-LOPEZ, School of Chemistry, University of Nottingham, University Park, Nottingham, UK
Room: MONTEFALCO

Session FO-5 - Vortex Lattice Physics

Chair: Maria IAVARONE, USA


TSUYOSHI TAMEGAI, A. PARK, N. ITOH, N. YAMAOKA, S. PYON, Department of Applied Physics, The University of Tokyo, Tokyo, Japan; T. KAMBARA, A. YOSHIDA, Nishina Center, RIKEN, Wako, Saitama, Japan; S. OKAYASU, Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Ibaraki, Japan; A. ICHINOSE, Central Research Institute of Electric Power Industry, Electric Power Engineering Research Laboratory, Yokosuka, Kanagawa, Japan

10.00  FO-5:IL02  Point-like Defects for Enhanced Flux Pinning in Technical Nb3Sn Superconductors

J. BERNARDI, S. PFEIFFER, USTEM, Technische Universität Wien, Wien, Austria; T. BAUMGARTNER, M. EISTERER, Atominstitut, Technische Universität Wien, Wien, Austria; L. BOTTURA, C. SCHEUERLEIN, A. BALLARINO, CERN, Geneva, Switzerland

10.30  Break

Chair: Tsuyoshi TAMEGAI, Japan

11.00  FO-5:L04  Nature of the Second Magnetization Peak in Superconducting Single Crystals

L. MIU, National Institute of Materials Physics, Bucharest-Magurele, Romania

11.20  FO-5:L05  STM Studies of Vortices in FeSe Single Crystals

M. IAVARONE, Department of Physics, Temple University, Philadelphia, PA, USA
Session FP-4 - Nanomaterials Systems for Bio-imaging and Theranostics

Chair: Thomas WEBSTER, USA

10.00 FP-4:IL04 Light-triggered Assembly of Gold Nanoparticles for Tumour Theranostics
XIAJU CHENG, HAIBIN SHI, Soochow University, Suzhou, Jiangsu, China

10.30 FP-4:L07 Rational Design of the Nano Bio Interface for Optimal Performance in Nanomedicine
I. YAROVSKY, P. CHARCHAR, N. TODOROVA, RMIT University, Melbourne Victoria, Australia

10.50 Break

Session FP-5 - Clinical Translations in Diagnosis and Therapy, and in Implantable Prostheses and Micro-nano Devices

11.20 FP-5:IL04 Nano-ceramics and their Use in Biomaterials, Drug Delivery, Tissue Engineering, and as Novel Antibiotic Agents
P. GHANNADIAB, T.J. WEBSTER, Northeastern University, Department of Chemical Engineering, Boston, MA, USA

11.50 FP-5:L07 Nanoplasmonic Quantification of Tumor-derived Extracellular Vesicles in Plasma Microsamples for Diagnosis and Treatment Monitoring
K. LIANG, F. LIU, J. FAN, D. SUN, C. LIU, D.W. BERNARD, M.H. KATZ, E. J. KOAY, Z. ZHAO, TONY Y. HU, The Biodesign Institute, Arizona State University, Tempe, AZ, USA
Room: **SPELLO**

**Session FE-3 - Direct Alcohol Fuel Cells (DAFCs)**

**Chair:** Antonino S. ARICO’, Italy

14.30 **FE-3/IL06** Catalysts with Low Noble Metal Content for Ethanol Electro-oxidation

N. SHAKIBI NIA, C. RÜDIGER, A. PADUANO, G. GARCÍA, A. MARTUCCI, E. PASTOR, J. KUNZE-LIEBhäUSER, Institut für Physikalische Chemie, Leopold-Franzens-Universität Innsbruck, Innsbruck, Austria; Department of Industrial Engineering, University of Padova, Padua, Italy; Instituto de Materiales y Nanotecnología, Universidad de La Laguna, La Laguna, Spain

15.10 **FE-3/IL07** Nano-sized Platinum-free Electrocatalysts in Alkaline Direct Alcohol Fuel Cells: Catalyst Design and Principles

K.I. OZOEMENA, Molecular Sciences Institute, School of Chemistry, University of the Witwatersrand, Johannesburg, South Africa
Room: SALA RELATORI

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

Chair: Yuzuru MIYAZAKI, Japan

14.30 FF-3:IL10 Enhancing Solar Energy Conversion by Hybrid Photovoltaic Thermoelectric Cells
D. NARDUCCI, Department of Materials Science, University of Milano Bicocca, Milan, Italy

15.10 FF-3:IL11 Power Generation and Durability of Oxide Based Thermoelectric Module
RYOJI FUNAHASHI1, T. URATA1, Y. MATSUMURA1, M. SUZUKI1, H. MURAKAMI1, H. IKENISHI1, T. TAKEUCHI1, R.O. SUZUKI2, S. SASAKI2, S. SUGIYAMA2, 1National Institute of Advanced Industrial Science & Technology, Ikeda, Osaka, Japan; 2Graduate School of Engineering, Hokkaido University, Japan; 3Akita Industrial Technology Center, Japan

15.50 FF-3:IL12 Integration of Skutterudites in Thermoelectric Devices
D. KENFAUL, I. KOGUT, B. LENOR, C. CANDOLFI, A. DAUSCHER, Institut Jean Lamour, UMR 7198 CNRS, Université de Lorraine, Campus Artem, Nancy Cedex, France; A. JACQUOT, J. KÖNIG, Fraunhofer IPM, Freiburg, Germany
Room: SPOLETO A

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

Chair: Franca ALBERTINI, Italy

14.30 FG-4:IL01 The Use of Compositionally Graded Films as Model Systems to Study Magnetic Materials for Energy Applications
N.M. DEMPSEY1, N.B. DOAN1, Y. HONG1,2, I. DE MORAES1, A. DIAS1, G. GOMEZ1, V.M.T.S. BARTHÉM1,3, M. BONFIM4, L. RANNO1, D. GIVORD1,3, 1Univ. Grenoble Alpes, CNRS/UGA, Grenoble INP, Institut Néel, Grenoble, France; 2School of Materials Science and Engineering, South China University of Technology, Guangzhou, China; 3Instituto de Física, Universidade Federal do Rio de Janeiro, RJ, Brazil; 4DELT, Universidade Federal do Paraná, Curitiba, Brazil

15.00 FG-4:IL02 Thermomagnetic Energy Generation Based on Magnetic Shape Memory Alloy Films
M. KOHL, M. GUELTI, H. OSSMER, Institute of Microstructure Technology (IIMT), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany; H. MIKI, M. OHTSUKA, Tohoku University, Sendai, Japan

15.30 FG-4:IL03 Magnetocaloric Heat Pumps
C.R.H. BAHL, S. DALL’OLIO, D. ERIKSEN, K. ENGELBRECHT, Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde, Denmark

16.00 FG-4:IL04 Novel Concept for Caloric Cooling - The Magnetocaloric Heat Pipe
L. MAIER, T. HESS, K. BARTHOLOME1, Fraunhofer Institute for Physical Measurement Techniques IPM, Freiburg, Germany
Room: BEVAGNA

Session FI-4 - Device Architectures and System Integration

Chair: Michele MUCCINI, Italy

14.30  FI-4:IL01  Integration and Process Technology for Flexible OLED Lighting Systems
       C. MAY, Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, Dresden, Germany

15.10  FI-4:IL02  Small Area Light Module Application, Simulation Modelling and Optimization for Architectural Lighting
       N. TRIVELLI, LightCube SRL and University of Padova, Padova, Italy; S. VENK, OSRAM SPA, Treviso, Italy

15.50  FI-4:IL03  Micro-Transfer Printing for Display Applications and Interactive Solid State Lighting
**Room:** CASCIA

**Chair:** Andriy ZAKUTAYEV, USA

### Session FJ-1 - Fundamentals

**14.30 FJ-1:IL02** Excitonic Effects and Dielectric Screening in Transparent Conducting Oxides  
**A. SCHLEIFE**, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA

### Session FJ-3 - Applications

**15.10 FJ-3:IL05** Transparent Materials for Perovskite (Opto-)electronics  
**T. RIEDL**, University of Wuppertal, Wuppertal, Germany

**15.50 Break**

**16.20 FJ-3:IL06** Low Damage Sputtering of TCOs for LEDs  
**M. MAUTE**, Osram Opto Semiconductors GmbH, Regensburg, Germany

**17.00 FJ-3:IL07** Toward Realization of Ga2O3 Transistors for Power Electronics Applications  
**MAN HOI WONG,** Y. NAKATA, C.-H. LIN, National Institute of Information and Communications Technology, Koganei, Tokyo, Japan; K. SASAKI, Tamura Corp., Sayama, Saitama, Japan, and National Institute of Information and Communications Technology, Koganei, Tokyo, Japan; Y. MORIKAWA, Silvaco Japan Co., Ltd., Yokohama, Kanagawa, Japan; K. GOTO, Tamura Corp., Sayama, Saitama, Japan, and Tokyo University of Agriculture and Technology, Koganei, Tokyo, Japan; A. TAKEYAMA, T. MAKINO, T. OHSHIMA, National Institutes for Quantum and Radiological Science and Technology, Takasaki, Gunma, Japan; A. KURAMATA, S. YAMAKOSHI, Tamura Corp., Sayama, Saitama, Japan; H. MURAKAMI, Y. KUMAGAI, Tokyo University of Agriculture and Technology, Koganei, Tokyo, Japan; M. HIGASHIWAKI, National Institute of Information and Communications Technology, Koganei, Tokyo, Japan
Session FK-7 - Materials Modelling and Database

Chair: Hua-Tay LIN, China

14.30 FK-7:IL02 A Large Scale Database of Cascade Configurations: A New Paradigm in Multi-scale Modelling of Radiation Damage Effects in Nuclear Materials
A.E. SAND, University of Helsinki, Helsinki, Finland; S.L. DUDAREV, CCFE, Culham Science Centre, Abingdon, UK

15.00 FK-7:IL03 EUROFER97 Ratcheting Behavior at 450 & 550°C and their Modelling
KUO ZHANG, JARIIR AKTAA, Karlsruhe Institute of Technology (KIT), Institute for Applied Materials, Eggenstein-Leopoldshafen, Germany

15.20 Break

15.50 FK-7:IL04 Modelling the Thermophysical and -mechanical Properties of Tungsten Fibre-reinforced Copper Metal Matrix Composites by means of Mean Field Homogenisation
A. VON MÜLLER, M. LI, R. NEU, J.H. YOU, Max-Planck-Institut für Plasmaphysik, Garching, Germany

16.20 FK-7:IL06 Structural Steels for DEMO and Fusion Power Plants
E. GAGANIDZE, C. DETHLOFF, B. KAISER, M. RIETH, J. AKTAA, Karlsruhe Institute of Technology, Institute for Applied Materials (IAM), Eggenstein-Leopoldshafen, Germany
THURSDAY JUNE 14 AFTERNOON

Room: MAGIONE A

Session FL-4 - Bio-medical Devices with Biological and Bio-inspired Materials

Chair: Gianluca FARINOLA, Italy

14.30 FL-4:IL06 Tailoring Conducting Polymer Scaffolds for Bioelectronics
S. INAL, Biological and Environmental Science and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia

15.10 FL-4:IL07 Biomimetic Microfluidics based on Stimuli-responsive Soft Polymers
D. DIAMOND, A. DUNNE, D. BRUEN, C. DELANEY, P. MCCLUSKEY, M. MCCAUl, L. FLOREA, INSIGHT Centre for Data Analytics, National Centre for Sensor Research, Dublin City University, Dublin, Ireland

15.50 FL-4:IL08 Heat Effect of Nanoparticles for Biotechnological Applications
J.M. DE LA FUENTE, Institute of Materials Science of Aragón, Zaragoza, Spain
Room: ORVIETO A

Session FM-1 - Magnetic, Ferroelectric and Multiferroic Materials for Memory Devices

Chair: Lucian PREJBEANU, France

14.30 FM-1:IL07 Electric-field Controlled Nucleation of Magnetic Skyrmions at Room Temperature
T. SRIVASTAVA, M. SCHOTT, A. HALLAL, M. CHSHIEV, S. AUFFRET, C. BARADUC, H. BEA, Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC, SPINTEC, Grenoble, France; M. SCHOTT, A. BERNAND-MANTEL, L. RANNO, V. KRIZAKOVA, S. PIZZINI, D. GIVORD, Institut NEEL/CNRS/UGA-Grenoble/ Grenoble-INP, France

15.00 FM-1:IL11 Magnetic Polarons in Strongly Correlated Materials for Spintronic Applications
V.G. STORCHAK, National Research Center “Kurchatov Institute”, Moscow, Russia

15.30 FM-1:L12 Self-assembled Network of Nanostructures in BiFeO3 Thin Films
B. COLSON, V. FUENTES, C. FRONTERA, F. SANDIUMENGE, LL. BALCELLS, B. MARTINEZ, A. POMAR, ICMA-CIC, Campus UAB, Bellaterra, Spain; D. COLSON, M. VIRET, A. FORGET, SPEC/IRAS/MIS/DSM, CEA-Saclay, Gif-sur-Yvette, France; J. SANTISO, ICN2, CSIC, BIST, Campus UAB, Bellaterra, Spain; Z. KONSTANTINOVIC, N. LAZAREVIC, M. SCEPANOVIC, Z.V. POPOVIC, CSSP/NM, Institute of Physics Belgrade, University of Belgrade, Serbia
THURSDAY  JUNE 14  AFTERNOON

Room:  ORVIETO B

Session FN-4 - Applications

Chair: Gianluca FIORI, Italy

14.30  FN-4:L16  Elastocaloric Effect in Carbon Nanotubes and Graphene
S. LISENKOV, University of South Florida, Tampa, FL, USA

14.50  FN-4:L17  Ammonia Sensing using Transfer-free in situ CCVD
Grown Nanocrystalline Graphene
D. NOLL, U. SCHWALKE, Institute for Semiconductor Technology and Nanoelectronics, Technische Universität Darmstadt, Darmstadt, Germany

15.10  FN-4:IL19  Aeronautical Composite Laminate Structure
Containing Graphene Related Materials
C. MERINO, Grupo Antolin Ingenieria, Burgos, Spain; T. BLANCO, A. BUTRAGUEÑO, Airbus Operations, Getafe, Spain; A. REGUERO, Aernnova, Toledo, Spain; J. LÓPEZ PUENTE, University Carlos III Madrid, Leganés, Spain

15.40  Break

Chair: Artur DIDEIKIN, Russia

16.10  FN-4:IL20  Graphene-based Neurointerfaces
M. BRAMINI, F. CESCA, F. BENEFANTI, Center for Synaptic Neuroscience and Technologies & Graphene Labs, Istituto Italiano di Tecnologia, Genova, Italy

16.40  FN-4:L21  Nanoscale Sensing using Color Centers in Diamond
A. SLAFLAB, M. RADTKE, R. NEJ, E. BERNARDI, A. MEYER, O. OPALUCH, M. CHALLIER, E. NEU, Saarland University, Saarbruecken, Germany

17.00  FN-4:IL22  Graphene Transistors in Biosensing Applications
S. ARPIAINEN, M. SOIKKELI, H. AROLA, T. NEVANEN, VTT Technical Research Centre of Finland Ltd, VTT, Finland
Session FO-7 - Superconductor Applications

Chair: Davor PAVUNA, Switzerland

14.30  FO-7:IL01  High Temperature Superconductors for Rotating Machinery and Power Applications
J.L. TALLON, Robinson Research Institute, Victoria University of Wellington, Lower Hutt, New Zealand

15.00  FO-7:IL02  Superconducting Thin-film Quantum Circuits: Coherence Limits
A. USTINOV, Karlsruhe Institute of Technology, Karlsruhe, Germany

15.30  FO-7:IL03  On Progress in Superconducting Electronics
S. PAGANO$^{1,2}$, N. MARTUCCIETTO$^1$, 1Physics Department, University of Salerno, Fisciano (SA), Italy; 2C.N.R. SPIN Salerno, Fisciano (SA), Italy

16.00  FO-7:IL04  Novel Josephson Junctions with Non-zero Ground State Phase
E. GOLOBIN, R. MENDITTO, D. KOELLE, R. KLEINER, University of Tübingen, Tübingen, Germany
POSTER PRESENTATIONS

POSTER DISCUSSION

THURSDAY JUNE 14: 16.30 - 18.30

Posters desmounting:
(Soon after the poster discussion)

FA:P01 Facile Synthesis of Flexible In-plane Graphene Micro-supercapacitor Using Flash Reduction
SEOK HUN KANG, I.G. KIM, B.N. KIM, J.H. SUL, I.K. YOU, Electronics and Telecommunications Research Institute, Daejeon, South Korea

FA:P04 Low-temperature Growth of Wafer-scale Layered MoS2 by Chemical Vapor Deposition for Flexible Devices
SANG-WOO KANG, JIHUN MUN, CHEGAL WON, Korea Research Institute of Standards and Science (KRISS), Daejeon, South Korea

FA:P05 High Performance Flexible a-IGZO TFTs with Highly Hydroxylated Dielectric Surfaces
YAN SHAO, MEI-NA ZHANG, WEN-JUN LIU, SHI-JIN DING, School of Microelectronics, Fudan University, Shanghai, China

FB:P03 Study of Bismuth Triiodide Nanoparticles Synthesis and their Application in Organic-inorganic Hybrid Bulk-heterojunction Solar Cells
L. BETHENCOURT, M.E. PÉREZ, H.Y. BENTOS PEREIRA, L.R. FORNARO, D. OREGGIONI, Grupo de Desarrollo de Materiales y Estudios Ambientales, Depto de Desarrollo Tecnológico, Centro Universitario Regional del Este, Universidad de la República, Rocha, Rocha, Uruguay; I.M. AGUIAR, M. MOMBRÚ, Grupo de Desarrollo de Materiales y Estudios Ambientales, Área Radioquímica, Facultad de Química, Universidad de la República, Montevideo, Montevideo, Uruguay

FB:P04 Plasmonic Coupling Effects in Metal-based Composites for Photovoltaics
N. BEREZOVSKA, I. DMITRUK, O. YESHCHENKO, V. KOZACHENKO, Dept. of Photonics, National Cheng Kung University, Tainan, Taiwan; PETER CHEN, 1Dept. of Physics, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”, Kyiv, Ukraine

FB:P05 2D/3D Mixed Perovskite Solar Cells by Low-pressure Vapor-assisted Solution Process
HUANG-HSIANG YEH1, YU-HSIEN CHIANG1, HUNG-HSIEN LI1, CHUN-JEN SU1, U-SEER JENG1, PETER CHEN1, 1Dept. of Physics, National Cheng Kung University, Tainan, Taiwan; 2National Synchrotron Radiation Research Center, Hsinchu City, Taiwan

FB:P06 Effective Methods for Improving Device Performance of Organic-inorganic Hybrid Perovskite Solar Cells
YANLIANG LIU1, YONGCHAO MA1, SONG HEUM PARK1, HO SUEB LEE2, KWAN JANG1, JUNG HYUN JEONG1, 1Dept. of Physics, National Cheng Kung University, Tainan, Taiwan; 2Physics Department, Changwon National University, Gyeongsangnam-do, South Korea

FB:P07 One-step Sputtering Process for high-efficiency Cu(In,Ga)Se2 Thin Film Solar Cells
CHIA-HAO HSU, WEI-HAO HO, SHIH-YUAN WEI, CHUNG-HAO CALWEI-CIH HUANG, CHIH-HUANG LAI, Department of Materials Science and Engineering, National Tsing Hua University, HsinChu, Taiwan

FC:P01 Beyond Photoelectrochemical Water Splitting
B. MEI, G. MUL, B. SEGER, PCS Group, MESA+ Institute for Nanotechnology, University of Twente, Enschede, Netherlands; Dept. of Physics, Technical University of Denmark, Kgs. Lyngby, Denmark

FC:P02 Intermediate Temperature Electro-reforming (ITER)
M.V. PAGLIARO1,2, M. BELLINI1, H.A. MILLER1, W. OBERHAUSER1, M.G. FOLLIERO1, A. MARCHIONNI1, J. FILIPP1, F. VIZZA1,1ICCOM - CNR, Sesto Fiorentino (Firenze), Italy; 2Dipartimento di Chimica, Università degli Studi di Siena, Siena, Italy
FC:P04 Energy Efficient Production of Fuels and Formate by CO2 Electroreduction on Copper Nanostructures
J. FILIPPI, M. BEVILACQUA, M. BELLINI, M. FOLLIERO, A. MARCIONNI, H.A. MILLER, M. PAGLIARO, F. VIZZA, ICOMM - CNR, Sesto Fiorentino, FI, Italy; Dept. of Biotechnology, Chemistry and Pharmacy, University of Siena, Siena, Italy

FD:P01 Investigating the Effect of the Hydrophobic Block Structure on Durability of Ion Exchange Membranes for Electrochemical Applications
J.H. LEE, IN GYOO KIM, S.H. KANG, Y.S. YANG, I.K. YOU, Electronics and Telecommunications Research Institute, Daejeon, South Korea

FD:P02 Durable Supercapacitor Based on Nanoscale Confinement of Manganese Oxide Nanoparticles in Hollow Carbon Nanostructures
C. HERREROS-LUCAS, A.N. KLHOLDBYSTOV, M.G. GIMENEZ-LOPEZ, School of Chemistry University of Nottingham, UK; M.W. FAY, Nanoscale and Microscale Research Centre, University of Nottingham, UK

FD:P03 Photoelectrode and Enhanced Properties of Graphene Oxide Electrode for Supercapacitor
J.H. LEE, S.N. LIM, Inst. for Nano Science and Technology, Daejeon, South Korea

FE:P03 Synthesis of Composites in the Y-doped ABO3 Peroxovitile Type Structure - V2O5 Systems by Impregnation Method
A. LACZ, E. DROZDZ, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland

E. DROZDZ, A. LACZ, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Krakow, Poland

FE:P08 Carbon Monoxide Poisoning Effect on Fuel Cell Performance with Consideration of Cathode Liquid Flooding
KEN-MING YIN, W.-K. XIA, Y.-L. LAI, Chemical Engineering Department, Yuan Ze University, Taoyuan, Taiwan

FF:P01 Optimization in Basic Thermoelectric Properties of n-type Mg2Si and Improvement in Elemental Durability Issues for Industrialization
TSUTOMU IIDA, T. KODAMA, M. TUKUMURA, H. HAMBA, T. MANBA, R. HATANAKA, D. SHIQIJI, K. NISHIO, A. YASUMORI, Y. KOGO, Dept. of Materials Science and Technology, Tokyo University of Science, Tokyo, Japan

FF:P03 Nanostructured Ag2Te/PEDOT:PSS hybrid Material for High Performance Thermoelectrics

FG:P02 The Effect of Zn and Ni Substitution on Magnetic and Microwave Absorbing Properties of Co2W Hexagonal Ferrites
HAN-SHIN CHO, TIAN LIU, SUNG-SOO KIM, Dept. of Advanced Materials Engineering, Chungbuk National University, Cheongju, South Korea

FG:P05 Magnetic and Transport Properties of Superelastic Fe43.5Mn34Al15Ni7.5 Heusler Alloys
V. KHOVAYLO, M. SEREDINA, M. YANG, A. BOGAICH, R. CHATTERJEE, T. OMORI, R. KAINUMA, National University of Science and Technology “MISIS”, Moscow, Russia; Prokhorov General Physics Institute, Moscow, Russia; Institute of Technology Delhi, New Delhi, India; Dept. of Materials Science, Graduate School of Engineering, Tohoku University, Sendai, Japan

FG:P06 FRIMAG Project: Development of a Prototype of Magnetocaloric Refrigerator
S. FABBRICI, MIST E-R scrl, Bologna, Italy; C. BENNATI, F. ALBERTINI, IMEM-CNRA, Parma, Italy; M. SOLZI, SMFI Dept., Univ. of Parma, Parma, Italy; F. MELINO, DIN - Alma Mater Studiorum Univ. of Bologna, Bologna, Italy; A. FARINA, Industrial Eng. Dept., University of Parma, Parma, Italy; V. MUSI, MUSP Consortium, Piacenza, Italy; M. ARDOINO, Democenter-Sipe, Modena, Italy; L. FERRARA, SPIN Applicazioni Magnetliche srl, Piacenza, Italy; E. FORLIN, MBN Nanomaterialia S.p.A., Vascen di Carbonera (TV), Italy; F. POLETTO, Jonix Srl, Bologna, Italy

FG:P07 Comparative Study of the Order-disorder Transition in Different Iron based Alloys with Different Cr Addition
Z. BELAMRI, D. HAMANA, Phase Transformations Lab., Univ. Mentouri of Constantine, Constantine, Algeria; National Polytechnic School of Constantine, Nouvelle Ville Universitaire Ali Mendjeli, Constantine, Algeria

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Micro Wires Graphene in Field Effect Transistors Defined by Photolithography Process
A. PASCON 1,2, F. RUFINO 1,2, D.R. GONZALEZ LARRUDE 2, J. REZENDE 2, J. ALEXANDRE DiNIZ 1,2, 1Center of Semiconductor Components and Nanotechnologies - Unicamp; 2Sao Francisco University, Campinas; 3School of Electrical and Computer Engineering - Unicamp; 4Mackenzie Presbyterian University, SP Brazil

Microfabricated Sensor for Detecting Biochemical Markers of Bone Formation
S. SIRIVISOOT, King Mongkut's University of Technology Thonburi, Bangkok, Thailand

Superconducting Properties of a new Oxy sulf ate Superconductor Defined by Photolithography Process
HO KEUN LEE, J. KIM, Dept. of Physics, Kangwon National University, Chuncheon, South Korea

Design and Simulation of 4-bit Random Access Memory Composed of Reciprocal Magnetic Flux Quanta
S. NARENDRAN, J. SELVAKUMAR, SRM Institute of Science and Technology, Chennai, Tamil Nadu, India

Development of Gold Nanorod-based SERS tag for Food Safety Monitoring
R. PARDEKHORRAM 1, YU anHUi zHENG 1, P. BA KT HAVATHSALAM 1, R. TILLEY 1, NANJU aLICE LEE 2, J.J. GOODING 1,2, 1school of Chemistry, 2school of Chemical engineering, 3ARC Centre of excellence in Convergent Bio-Nano Science and Technology, Sydney, NSW, Australia

Investigation of Optical Properties of Y-TZP for Aesthetic Dental Application: Effect of Oxygen Vacancies
R. SHAHMI R I, O.C. STANDA R D, J.N. HART, C.C. SORRELL, School of Materials Science and Engineering, University of New South Wales Sydney, Sydney, Australia

Synthesis of Nanometric TiO2 and its Application as Bionanomaterial
V. GONZAlEZ-TORRES, M.R. SÁNCHEZ-DÍAZ, Escuela de Ciencias de la Salud Valle de las Palmas de la Universidad Autónoma de Baja California, Tijuana, Baja California, México; M. ROSALES-AUGUILA, Fac. de Medicina y Psicología de la Universidad Autónoma de Baja California, Tijuana, Baja California México; Ma.E. VILLAFUERTE-CASTREJÓN, Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Ciudad de México, México; E. HERNANDEZ-GUEVARA, G.C. DÍAZ-TRUJILLO, Fac. de Ciencias Químicas e Ingeniería de la Universidad Autónoma de Baja California, Tijuana, Baja California, México

Isolation and Imaging of Circulating Tumor Cells
CHIUNG WEN KUO, PEILIN CHEN, Research Center for Applied Sciences, Academia Sinica, Taiwan

Programmable Multiple Capture/Release of Circulating Tumor Cells Using Conducting Polymers
DI-YEN CHUEH, CHIUNG WNE KUO, PEIL IN CHEN, Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan

Ternary Ti-Si-C Alloy Film Formation on GaN and Contact Properties
Y. TAKAHASHI, M. ARAI, M. MAEDA, JWRi, Osaka University, Osaka, Japan

Cool Plasma Sintering for Turning Printed Copper Particles into Bulk Metal
NAOKI SHIRAKAWA, Flexible Electronics Research Center, AIST, Tsukuba, Japan

High-performance Fullerene-free Organic Solar Cells based on Small Molecule Donor and Acceptor
SO R A OH, W ON SUK SHIN, SANG-JIN MOON, CHANG EUN SONG, SANG KYU LEE, Korea Research Institute of Chemical Technology, Daejeon, South Korea

80 μm Thickness Silicon Wafer Manufacturing by Multi-wire Sawing Process
JOONSOO KIM, BOYUN JANG, SUNH O CHOI, Korea Institute of Energy Research, Daejeon, South Korea

Effect of Zr and Zr7Ni10 on Hydrogenation Kinetics of Ti-V-Cr Alloys
V. DIXIT, J. HUOT, IRH, UQTR, Trois-Rivières, Québec, Canada

**HOT POSTERS**

Ternary Ti-Si-C Alloy Film Formation on GaN and Contact Properties
Y. TAKAHASHI, M. ARAI, M. MAEDA, JWRi, Osaka University, Osaka, Japan

Cool Plasma Sintering for Turning Printed Copper Particles into Bulk Metal
NAOKI SHIRAKAWA, Flexible Electronics Research Center, AIST, Tsukuba, Japan

High-performance Fullerene-free Organic Solar Cells based on Small Molecule Donor and Acceptor
SORKA OH, WON SUK SHIN, SANG-JIN MOON, CHANG EUN SONG, SANG KYU LEE, Korea Research Institute of Chemical Technology, Daejeon, South Korea

80 μm Thickness Silicon Wafer Manufacturing by Multi-wire Sawing Process
JOONSOO KIM, BOYUN JANG, SUNHO CHOI, Korea Institute of Energy Research, Daejeon, South Korea

Effect of Zr and Zr7Ni10 on Hydrogenation Kinetics of Ti-V-Cr Alloys
V. DIXIT, J. HUOT, IRH, UQTR, Trois-Rivières, Québec, Canada
FC:HP07  Tailoring Hydrogen Activation and Release by Novel Frustrated Lewis Pair Systems
H. KILDAHL, M.C. CORREIA, Maastricht Science Programme, Maastricht University, Maastricht, Netherlands

FC:HP08  Electrochemical Reforming of 1,3-propanediol for Acrylate and Hydrogen Production
M. BELLINI, J. MAHMOUDJAN, M.V. PAGLIARO, W. OBERHAUSER, M. INNOCENTI, F. VIZZA, H.A. MILLER, Istituto di Chimica dei Composti Organometallici ICOM-CNRS, Sesto Fiorentino (FI), Italy

FD:HP06  Comparative Electrochemical Study for MnOx Phase-variable Composites Derived from MnO2/GO Templates as for Li-rechargeable Battery Electrodes
JI YONG JU, SEULGI JI, SUN SOOK LEE, YONGSEON KIM, WON BIN IM, HA-KYUN JUNG, YONGKU KANG, SUNGHO CHOI, Korea Research Institute of Chemical Technology, Energy Materials Center, Daejeon, South Korea

FD:HP07  Comparative Characterization of Catalytic Properties of Ta, Nb, NixCoY and Carbon in Sodium-Air Batteries
E. FAKTOROVICh SIMON1, A. NATAH2, D. GOLONDITSKY1, E. PELED1, 1School of Chemistry, Tel Aviv University, Tel Aviv, Israel; 2Dept. of Physics and Electrical Engineering & Electronics, Faculty of Engineering, Tel Aviv University, Tel Aviv, Israel

FD:HP08  Towards Fast Manufacturing of Self-standing Conductive Polymer Layers
F. AHMED, U. ALL, A. GRIMOLDI, T. EDERTH, M. BERGGREN, X. CRISPIN, Lab. of Organic Electronics, Dept. of Science and Technology, Linköping University, Sweden; K. HÅKANSSON, Wallenberg Wood Science Center, KTH Royal Institute of Technology, Stockholm, Sweden

FD:HP09  Morphological Studies of Cellulose-PEDOT:PSS Conducting Paper
D. BElaineH1, S. MALTI1, A. GRIMOLDI1, M. MODARRESI1, L. WÄGBERG2, X. CRISPIN1, M. BERGGREN1, I. ENGOQUIST1, 1Lab. of Organic Electronics, Dept. of Science and Technology, Linköping University, Norrköping, Sweden; 2Dept. of Fibre and Polymer Tech., KTH-Royal Institute of Technology, Stockholm, Sweden

FE:HP09  Stability Evaluation of SSC Fibrous Cathode with Embedded SDC Particles for Solid Oxide Fuel Cell
SEWOK LEE, SANGWO PARK, DONGWOOK SHIN, Division of Materials Science and Engineering, Hanyang University, Seoul, South Korea

FF:HP07  Energy-saving Synthesis of Bi2Te3 with Poker Deck Morphology
FEI-HUNG LIN, CHIA-JYI LIU, Dept. of Physics, National Changhua University of Education, Changhua, Taiwan

FF:HP08  Facilitated Determination of Local Composition in Inhomogeneous Quasi-binary Material Systems from Backscattered Electron Image Contrast
E. MUeller1,2, M. YASSERI1,2, N. FARAH1, K. KELM1, J. DE BOOR1, 1Institute of Inorganic and Analytical Chemistry, Justus Liebig University of Giessen, Giessen, Germany; 2Institute of Materials Research, German Aerospace Center (DLR), Koeln, Germany

FF:HP09  Influence of Ba2+ Doping on Thermoelectric Properties of BiCuSeO Fabricated by Spark Plasma Sintering
KYEONGSOON PARK, JONG Hoon KIM, HO YOUNG HONG, GUN WOO JUNG, JOON WOO PI, Sejong University, Seoul, South Korea

FG:HP10  High-temperature- and High Magnetic-field-resistant, Non-volatile Memory in Ni2MnX (X: Al, Ga, In, Sn, Sb) and Soft Magnetism Fe2MnX in Heusler Nano-precipitates
A. CAKIR1, M. ACET2, 1Dept. of Metallurgical and Materials Engineering, Mugla Sıtkı Koman University, Mugla, Turkey; 2Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany

FI:HP06  Formation of Tin Sulfide Thin Films and Tin Chalcogenide Nanomaterials Using Novel Tin Single Source Precursors
BO KEUN PARK, SEONG GU KANG, TAEK-MO CHUNG, CHANG GYOUN KIM, Thin Film Materials Research Center, Korea Research Institute of Chemical Technology, Daejeon, South Korea

FK:HP05  Boron Carbide- and MAX phases- based Materials for Nuclear Reactors
T. PRIKHNA1, A. KOZREVY2, P. BAVRITSKY1, V. SVERDUN1, V. MOSCHCH1, YU. CHAYKOVSKY1, M. EISTERTS1, L. CHIRKO2, V. Babuk Institute for Superhard Materials of the National Academy of Sciences of Ukraine (NASU), Kiev, Ukraine; 2Institute for Nuclear Research of the National Academy of Sciences of Ukraine, Kiev, Ukraine; 2Atominstytut, TU Wien, Vienna, Austria
FK:HP06 Thermal Expansion and Shrinkage of a Bentonite Clay Measured by Dilatometry under Humid and Dry Conditions
E. POST, NETZSCH Geraetebau GmbH, Selb, Germany

FM:HP10 Nanofilaments at Heat-treated TiO2 (110) for Memristive Devices and Neuromorphic Applications
E. POST

FM:HP11 Anodic Titanium Oxides for Resistive Switching Memories
M. ROGAL

FM:HP08 Low-density Carbon Nanotube Micro-yarns: Improving Electrical Properties by Mechanical Processes

FN:HP07 Optical Evidence on the Unconventional Superconductivity in Ca8.35La1.65(As3P8)(Fe2As2)5 Single Crystal
YONG SEUNG KWON, YU-ILO seo, Woo-Jae CHoi, Dgist, emerging Materials science, Daegu, Korea

FN:HP05 Thermal Relaxation Time of Superconducting NbTi Strips deduced from the Nucleation Time of Current-induced hot Spots
K. HARRABI, A. MEKKI, N. MAALEJ, K. GASMII, J.P. MANEVAL

FO:HP06 Superconductivity in Pressurized CeRhGe3 and Related Noncentrosymmetric Compounds
HONGHONG WANG, Jing GUO, E.D. BAUER, V.A. SIDOBOY, HENGGCAN ZHAO, JIAHAO ZHANG, YAZHOU ZHOU, ZHE WANG, SHU CAI, KE YANG, AIGUO LI, YI-FENG YANG, QI WU, TAO XUAN, J.D. THOMPSON, LILING SUN, J. FLORES, C. H. BARNES

FO:HP05 Fabrication of YBa2Cu3O7-d Films using Trifluoroacetates on SrTiO3 and YSZ Substrates

FP:HP11 TCP Based Bone Cements with Silver-doped Hydroxyapatite and CaCO3
A. SLOSARCZYK

FP:HP12 The Microconcrete Type Bone Implant Materials on the Basis of Calcium Phosphates and Chitosan
A. ZIMA

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Publication Policy

Authors at CIMTEC 2018 may submit their contribution to any journal or other media sources they find appropriate. However they have the opportunity to submit their papers for publication in special issues of Elsevier-TechnaGroup journal “Ceramics International” https://www.journals.elsevier.com/ceramics-international and in its parent journal “Ceramics in Modern Technologies” https://www.technagroup.it/journals_and_magazines/ceramics_in_modern_technologies

A window for papers uploading will be opened at both journal websites as from June 15 to July 15. We regret that late submissions will not be considered.

SUBMISSION INFORMATIONS

1- Only papers presented at CIMTEC 2018 by Authors who attended the conference may be submitted.

2- The Corresponding Author for the submitted paper shall be the one registered at the Conference as Presenting Author for the paper.

3- The Code Number assigned to the paper shall be mandatorily reported at the end of the title of the submitted paper. Example: Iron Boride Coatings for Wear and Corrosion Resistance Applications (CH-5:IL02).

If the Code Number is not indicated, the paper will not be recognized as a CIMTEC 2018 contribution with the risk to be rejected without peer review.

4- All papers will be subjected to a single blind peer review process.

The following submission options are available:

- 14th International Ceramics Congress

Symposia from CA to CL, Focused Session CB-8 and Conference CO Contributions primarily dealing with basic science, materials properties and properties/processing relationships are most appropriate for submission to “Ceramics International” whereas advanced manufacturing- and application-oriented contributions are most appropriate for submission to “Ceramics in Modern Technologies”. It is up to Authors to choose to which Journal submit their contribution, but Journal Editors may redirect any submitted paper to the more appropriate Journal.

Symposia CM and CN, and Focused Sessions CB-9 and CB-10 All contributions can to be submitted to “Ceramics in Modern Technologies”

- 8th Forum on New Materials

Contributions presented at all Symposia and Conferences of the Forum dealing with ceramics (i.e. oxide and non-oxide ceramics, inorganic glasses, new nanocarbons, composites and hybrids) may be submitted to “Ceramics International” if dealing primarily with basic aspects of materials science and to “Ceramics in Modern Technologies” if addressing matter most related to developments in processing, devices and application engineering.
Ceramics International is particularly keen to attract papers which deal with fundamental scientific aspects that are relevant to the development of the whole range of advanced ceramics including e.g. phase equilibria and transformations, reactivity, transport processes, thermodynamic and electronic properties, as well as quantum effects in low dimensional materials. The journal encourages contributions that demonstrate how an understanding of the basic chemical and physical phenomena may direct materials design and stimulate ideas for new or improved processing techniques, in order to obtain materials with desired structural features and properties.

Ceramics International covers oxide and non-oxide ceramics, functional glasses, glass ceramics, amorphous inorganic non-metallic materials (and their combinations with metal and organic materials), in the form of particulates, dense or porous bodies, thin/thick films and laminated, graded and composite structures. Technologically relevant low-dimensional systems are a particular focus of Ceramics International. These include 0, 1 and 2-D nanomaterials (also covering CNTs, graphene and related materials, and diamond-like carbons), their nanocomposites, as well as nano-hybrids and hierarchical multifunctional nanostructures that might integrate molecular, biological and electronic components.

Process related topics such as ceramic-ceramic joints or joining ceramics with dissimilar materials, as well as surface finishing and conditioning are also covered. Besides traditional processing techniques, manufacturing routes of interest include innovative procedures benefiting from externally applied stresses, electromagnetic fields and energetic beams, as well as top-down and self-assembly nanotechnology approaches. In addition, the journal welcomes submissions on bio-inspired and bio-enabled materials designs, experimentally validated multi scale modelling and simulation for materials design, and the use of the most advanced chemical and physical characterization techniques of structure, properties and behaviour.
Ceramics in Modern Technologies publishes original fully peer-reviewed papers on functionalization, industrialization and application of:

- advanced oxide and non-oxide ceramics
- traditional silicate ceramics
- industrial refractories
- new nanocarbons and other low dimensional nanostructures
- smart and special glasses
- new cements including geopolymers
- inorganic synthetic zeolites and pillared materials

All major users areas are covered such as energy and environment, electronics, optics and communications, aerospace and transport, construction, building, processing industry, mechanical and high temperature engineering, and the biomedical field.

Primary interest is for experimental and theoretical contributions dealing with materials functionalization and industrialization, new device architectures, system integration, on-service performance, in-situ and non destructive testing, as well as on experimentally validated multiscale modelling and simulation of processes, devices and performance.

The design, realization and testing of prototype products and devices, pilot scale demonstrations, case studies and cost models perfectly fit the scopes of the journal as well as aspects of green manufacturing and of proper management of materials, energy and labour resources, including waste recycling and disposal.

The journal also encourages critical reviews on still developing fields of processing and application, analyses of the drivers for innovation and of barriers to commercialization coming from alternative materials technologies.
The monastery was created around 102 over the former cathedral church, seat of Perugia’s bishops, existing since the early seventh century, although the first document citing the abbot is from 1002. Its early patron was Pietro Vincoli, a Perugian noble, later canonized. In the following centuries the abbey increased greatly its power, until in 1398 it was burnt by the Perugini, as the abbot Francesco Guidalotti had taken part in the plot against Biordo Michelotti, chief of the popular party. The monastery refloresced with Pope Eugene IV, who united it to the Congregation of St. Justine of Padua, maintaining a position of prestige and power in the city. The abbey was temporarily suppressed by the French in 1799. The monks had aided the Perugine revolt of 1859 against the Papal government, and, after the Unification of Italy, the new government allowed them to remain in the Abbey. The Abbey has two more cloisters: one, called Chiostro Maggiore, is a Renaissance construction attributed to Guido da Settignano, another, also known as Chiostro delle Stelle, is from 1571.

At the Welcome Party delegates will enjoy a variety of renowned Umbria traditional dishes and drinks in an elegant and friendly environment.

Entrance ticket for non-registered companions: 30.00 EUR
Concert “Opera Gran Gala”
Teatro Morlacchi

Wednesday June 13
21.30 - 23.30

The “Opera Gran Gala” will be performed by the renowned “Lucca Philharmonic Orchestra” at the magnificent Teatro Morlacchi in Perugia. The Orchestra is composed of about sixty players. Singers: Soprano Francesca Maionchi and Bianca Barsanti; Tenors Simone Frediani and Simone Mugnaini. Master conductor: Andrea Colombini.

The programme will include pieces by: G. Bizet, W.A. Mozart, G. Puccini, J. Strauss, R. Leoncavallo and J. Offenbach.

Entrance ticket for non-registered companions: 30.00 EUR (subjected to place availability)
Conference Dinner
Chiostro di Santa Giuliana

Thursday June 14
20.30 - 23.00

The Conference Dinner will take place at the St’ Giuliana Cloister (Chiostro di Santa Giuliana). The Cloister is part of the monumental complex of St’ Giuliana erected around the year 1253 and now the seat of the School for Foreign Languages of the Italian Army. The splendid cloister by architect Matteo Gattapone constitutes one of highest examples of “circestence” architecture in Italy and is characterized by wide white arches supported by octagonal pillars with pink and white stripes, also including some capitals remnants of previous Roman building.

Entrance ticket for non-registered companions: 60.00 EUR (subjected to place availability)
Optional Tours

PERUGIA, PASSIGNANO & TRASIMENO LAKE

Monday June 11, full day
9.30 - 19.00

Perugia (https://en.wikipedia.org/wiki/Perugia) is the capital city of the Umbria region in central Italy, crossed by the river Tiber. It is located about 170 km north of Rome, and 150 km south-east of Florence. It covers a high hilltop and part of the valleys around the area.

The history of Perugia goes back to the Etruscan period. Perugia was one of the main Etruscan cities. The city is also known as the universities town, with the University of Perugia founded in 1308 (about 34,000 students), the University for Foreigners (5,000 students), and some smaller colleges such the Academy of Fine Arts “Pietro Vannucci” (Italian: Accademia di Belle Arti “Pietro Vannucci”) public athenaeum founded in 1573, the Perugia University Institute of Linguistic Mediation for translators and interpreters, the Music Conservatory of Perugia, founded in 1788, and others Institutes. There are annual festivals and events: the Eurochocolate Festival (October), the Umbria Jazz Festival (July), and the International Journalism Festival (April).

Perugia is a well-known cultural and artistic centre of Italy. The famous painter Pietro Vannucci, nicknamed Perugino, was a native of Città della Pieve near Perugia. He decorated the local Sala del Cambio with a beautiful series of frescoes; eight of his pictures can also be admired in the National Gallery of Umbria. Perugino was the teacher of Raphael, the great Renaissance artist who produced five paintings in Perugia (today no longer in the city) and one fresco. Another famous painter, Pinturicchio, lived in Perugia. Galeazzo Alessi is the most famous architect from Perugia. The city symbol is the griffin, which can be seen in the form of plaques and statues on buildings around the city.

The tour includes:
- Corso Vannucchi (main Perugia street)
- Historical buildings: Palazzo dei Priori and Sala dei Notari
- Cathedral
- Main Fountain (Fontana Maggiore)
- Etruscan Arch
- Medieval alleys and panoramic views
Passignano sul Trasimeno (Passignano on Trasimeno Lake) is placed on the lakeshores. The town was built between the 16th and the 17th Century whereas its suggestive historical centre surrounding the fortress dates back to medieval and also to most ancient times. After a view of the historical centre, participants will take a ferry to visit Isola Maggiore, the biggest island of Lake Trasimeno.

The lake is south of the river Po and north of the nearby river Tiber. Only two minor streams flow directly into the Lake and none flows out. The water level of the lake fluctuates significantly according to rainfall levels and the seasonal demands from the towns, villages and farms near the shore. The first civilization to inhabit this area was the Etruscans; three of the main Etruscan cities - Perugia, Chiusi, and Cortona - are within 20 kilometres (12 miles) of the lake. Little physical evidence remains from the period of Etruscan or later Roman settlement. Castiglione del Lago, has some Roman ruins and its main streets are structured like a chessboard in the Roman style. The lake includes three islands: Isola Maggiore, Isola Polvese and Isola Minore.

Meeting point: Centro Congressi Quattrotorri at 9.00. Return to Perugia at about 19.00.
The participation fee (70.00 EUR) includes bus transfer, English speaking hostess and local guides, served lunch and ferry ticket.
Spoleto, (Latin Spoletium) is an ancient city in the Perugia district located at the head of a large, broad valley, surrounded by mountains. The town has long occupied a strategic geographical position. It appears to have been an important town to the original Umbri tribes, who built walls around their settlement in the 5th century BC, some of which are visible today. An ancient Roman colony, after Ostrogoth and Lombard, medieval town contended between the Pope and the Emperor, between Guelfs and Ghibellines, cultural centre during the Renaissance and Bishop seat, the history of the City has left an exceptional architectonic and art cultural heritage within a splendid naturalistic context. The Acquedotto delle Torri (Towers Aqueduct) with its majesty and beauty welcomes us when joining Spoleto. The tour includes:
- Town walls, “Torre dell’Olio” (Oil Tower) and Porta Fuga (Fuga Door)
- Roman Theatre
- Domus of Flavia Vespasia Pollia Domus, mother of Roman Emperor Vespasiano
- Arco di Druso (Arch of Drusus)
- Roman church of Sant’Eufemia
- Cathedral square
- Ponte delle torri (Tower Bridge) connecting the historical centre. The bridge, built in between the 12th and 13th Century, is 280 meters long and 82 meters high.

Lunch: Restaurant in Spoleto

Montefalco, a charming tow built on a hill overlooking the valley linking Perugia with Spoleto, has been settled since the times of the Umbri. It has been under the successive domination of the Romans, Lombards, being called Coccorone in the Middle Ages. In 1249 it
was sacked by Frederick II, but was soon rebuilt with the modern name. From the 13th century it had been a free comune under the domination of local nobles and merchants, but later, as with many other Umbrian locales, the comune gave way to government by a signoria (1383-1439). In 1446 it fell under the rule of the Papal States where it remained until the unification of Italy in 1861. Montefalco has several churches, some in the Romanesque, some in the Gothic and some in the Renaissance style. The 13th century Palazzo Comunale ("Town Hall") has a mullioned window from the original edifice and a 15th-century portal. Also notable are the gates in the walls, including Porta Sant’Agostino, Porta Camiano and Porta Federico II.

The tour includes:
- Saint Francis Church
- Architectural lodges
- Main Square
- Consuls Palace and Palace of the Podestà
- Cathedral
- Ducal Palace
- Medieval street sand panoramic views

Meeting point: Centro Congressi Quattrotorri at 9.00. Return to Perugia at about 19.00.
The participation fee (60.00 EUR) includes bus transfer, English speaking hostess and local guides, and served lunch.
Placed on the slope of Subasio Mountain (Monte Subasio), Assisi (https://en.wikipedia.org/wiki/Assisi) is without any doubt the most internationally renowned city from Umbria Region its fame mainly deriving from being the birth place of San Francis (San Francesco) the patron saint of Italy. UNESCO collectively designated the Franciscan structures of Assisi as a World Heritage Site in 2000. The city retains vestiges of the Roman age whereas the Middle Ages urban planning remains practically untouched.

The Basilica of San Francesco d’Assisi (St. Francis) is the major sight in Assisi. The Franciscan monastery, il Sacro Convento, and the lower and upper church (Italian: Basilica inferiore and Basilica superiore) of St Francis were begun in 1228, and completed in 1253. The lower church has frescoes by the late-medieval artists Cimabue and Giotto; the upper church houses frescoes of scenes in the life of St. Francis previously ascribed to Giotto, but now thought to be by artists of the circle of Pietro Cavallini from Rome.

The visit includes:
- Basilica di San Francesco (St. Francis Church)
- Piazza del Comune (Town Hall square)
- Tempio della Minerva (Minerva Temple)
- Chiesa Nuova (New Church built over the presumed parental home of St. Francis)
- Oratorio di San Francesco piccolino (Oratory of St. Francis)
- Basilica di Santa Chiara (Basilica of St. Clare)

Lunch: Restaurant in Assisi
Spello (in Antiquity: Hispellum) (https://en.wikipedia.org/wiki/Spello) is an ancient town placed on the lower southern flank of Mt. Subasio, about 6 km from Assisi. The old walled town lies on a regularly NW-SE sloping ridge that eventually meets the plain. From the top of the ridge, Spello commands a good view of the Umbrian plain towards Perugia; at the bottom of the ridge, the town spills out of its walls into a small modern section (or Borgo).

Spello remains four monumental gates and a long track of walls of Roman Age, besides the ruins of Roman amphitheatre and holy buildings. The Middle Ages town is one of the more fascinating of the Umbria Region.

The visit includes:
- Porta Urbica (Urbica Gate)
- Mura Romane (Roman Walls)
- Porta Consolare (Consular Gate)
- Chiesa Collegiata di Santa Maria Maggiore (Santa Maria Maggiore Church with Pinturicchio frescoes)
- Palazzo Comunale (Medioeval Tawn Hall)
- Palazzo Cruciali (Cruciali Palace)
- Belvedere (panoramic viewpoint)
- Porta Venere con Torri di Propezio (Venere Gate and Propezio Towers)

Meeting point: Centro Congressi Quattrotorri at 9.00. Return to Perugia at about 19.00.

The participation fee (60.00 EUR) includes transportation, city entrance taxes, English speaking hostess and local guides, and lunch.
Gubbio (https://en.wikipedia.org/wiki/Gubbio), located on the lowest slope of Mt. Ingino, a small mountain of the Apennines, is among the best preserved splendid Middle Ages city of Umbria Region. The city’s origins are very ancient. The hills above the town were already occupied in the Bronze Age, followed by Umbrian people and Roman conquest in the 2nd century BC. Gubbio became very powerful in the beginning of the Middle Ages and became part of the Papal States in 1631. The historical centre of Gubbio has a decidedly medieval aspect: the town is austere in appearance because of the dark grey stone, narrow streets, and Gothic architecture. Many houses in central Gubbio date to the 14th and 15th centuries, and were originally the dwellings of wealthy merchants.

Among most important buildings and sites in the city are: Roman Theater and Roman Mausoleum, Palazzo dei Consoli, Duomo, Palazzo Ducale and several others.

The visit includes:
- Chiesa di San Francesco (St. Francis Church)
- Logge (Open galleries)
- Piazza Grande (Main Square)
- Palazzo dei Consoli e Palazzo del Podestà (Middle Ages public palaces)
- Cattedrale (Cathedral)
- Palazzo Ducale (Dukes Palace)
- Middle Ages alleys and panoramic views

Meeting point: Centro Congressi Quattrotorri at 9.00. Return to Perugia at about 13.00.

The participation fee (30.00 EUR) includes transportation, city taxes, English speaking guide.
1. Best Western Hotel Quattrotorri
   CONGRESS CENTER
2. Relais Olmo
3. Perugino
4. Meridiana
5. Etruscan
6. Grifone
7. Sangallo
8. Brufani
9. Ilgo
10. Teatro Morlacchi
    (Jazz Concert)
11. Chiostro S. Giuliana
    (Welcome Reception)
12. Saint Peter Monastery
13. Central Railway Station
14. Ellera Railway Station
15. Piazza Partigiani
    Bus Transfer to/from Congress Center