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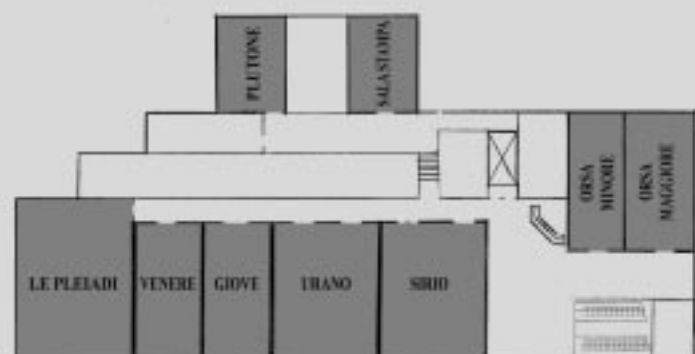
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PALAZZO DEI CONGRESSI

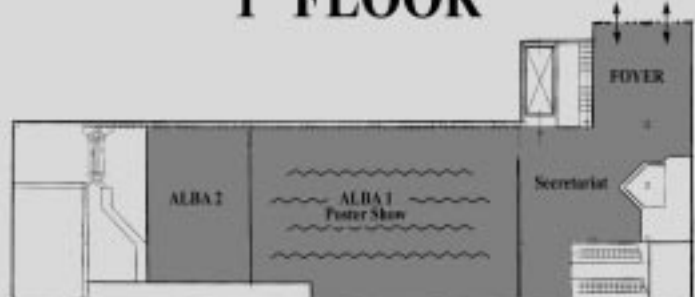
Via Amendola, 2



2nd FLOOR



1st FLOOR

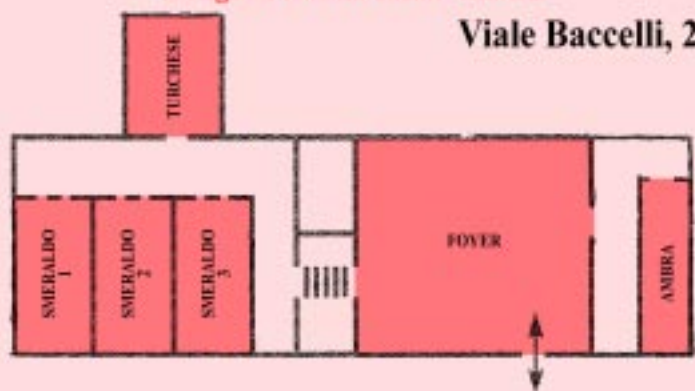


GROUND FLOOR

VITTORIA CONGRESSI

Congress Centre Hotel Vittoria

Viale Baccelli, 2



**Symposia held at
“PALAZZO DEI CONGRESSI”**

Via Amendola 2

**Symposium FA
Advanced Fossil Fuel Energy Technologies:
The Materials Demand**

**Symposium FB
Materials and Process Innovation in Hydrogen
Production and Storage**

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

**Symposium FD
Electrochemical Energy Storage Systems:
The Next Evolution**

**Symposium FE
Advances in Materials and Technologies for Efficient
Direct Thermal-to-electrical Energy Conversion**

**Symposium FG
Photovoltaic Solar Energy Conversion:
Materials and Technology Challenges**

**Symposium FH
Concentrating Solar Technologies**

**Symposium FI
Recent Developments in the Research and Application of
Transparent Conducting and Semiconducting Oxides**

**Symposium FJ
Materials and Technologies for
Solid State Lighting**

**Symposium FM
Electromagnetic Metamaterials**

**Symposia held at
“VITTORIA CONGRESSI”**

Viale Baccelli 2

4 min walking distance from the “Palazzo dei Congressi”

**Symposium FF
Materials Challenges for Future Nuclear Fission and
Fusion Technologies**

**6th International Conference
Science and Engineering of
Novel Superconductors**

**9th International Conference
Medical Applications of Novel Biomaterials
and Nano-biotechnology**

FORUM OUTLINE

SYMPOSIUM **FA**

Advanced Fossil Fuel Energy Technologies:
The Materials Demand

SYMPOSIUM **FB**

Materials and Process Innovations in Hydrogen
Production and Storage

SYMPOSIUM **FC**

Fuel Cells:
Materials and Technology Challenges

SYMPOSIUM **FD**

Electrochemical Energy Storage Systems:
The Next Evolution

SYMPOSIUM **FE**

Advances in Materials and Technologies for
Efficient Direct Thermal-to-electrical
Energy Conversion

SYMPOSIUM **FF**

Materials Challenges for Future Nuclear Fission
and Fusion Technologies

Focused Session **FF-10**

*Materials Technology for Nuclear Waste Treatment and
Disposal*

SYMPOSIUM **FG**

Photovoltaic Solar Energy Conversion:
Materials and Technology Challenges

SYMPOSIUM **FH**

Concentrating Solar Technologies:
Materials and Technology Solutions for
CPV and CSP Competitiveness

SYMPOSIUM **FI**

Recent Developments in the Research and
Application of Transparent Conducting and
Semiconducting Oxides

SYMPOSIUM **FJ**

Materials and Technologies for Solid State
Lighting

SYMPOSIUM **FM**

Electromagnetic Metamaterials

Serial Conferences

FK

6th International Conference

Science and Engineering of Novel
Superconductors

FL

9th International Conference

Medical Applications of Novel Biomaterials and
Nano-biotechnology

Meeting Rooms by Symposia / Conferences

PALAZZO DEI CONGRESSI

OPENING SESSION AUDITORIUM

Symposium FA ALBA 2

Symposium FB AUDITORIUM
..... ALBA 2

Symposium FC VENERE

Symposium FD GIOVE
..... VENERE

Symposium FE URANO

Symposium FG LE PLEIADI

Symposium FH ORSA MINORE
..... LE PLEIADI

Symposium FI SIRIO

Symposium FJ ORSA MAGGIORE

Symposium FM ORSA MINORE
..... GIOVE

VITTORIA CONGRESSI

Symposium FF SMERALDO 1
..... AMBRA
..... TURCHESE

Conference FK SMERALDO 2
..... AMBRA

Conference FL SMERALDO 3
..... TURCHESE

Events by Day

Sunday June 13

11.00-13.00 15.00-19.00

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

15.00-19.00

POSTER MOUNTING

Monday June 14

Morning: 9.30-13.00

Opening Session
Welcome Addresses

Plenary Lectures (F:PL1-PL3)

8.30-13.00

POSTER MOUNTING

Monday June 14

Afternoon: 15.00-19.30

- Symposium FA (FA-1.1:IL01-IL04)
(FA-2.1:IL01-IL03)
- Symposium FB (FB-1.1:IL01-L04)
(FB-2.2:IL01-IL03)
- Symposium FC (FC-1:IL04-IL06)
(FC-1:IL01-IL03)
- Symposium FD (FD-1:IL02-IL04)
(FD-1:IL05-IL06)
- Symposium FE (FE-1:IL03-IL04)
(FE-2:IL01-L04)
- Symposium FF (FF:KL)
(FF-1:IL01-IL04)
(FF-2:IL01-IL03)
- Symposium FG (FG:KL)
(FG-1:IL01-L04)
(FG-2:IL01-L03)
- Symposium FI (FI-1:IL02-L09)
- Symposium FJ (FJ-1:IL01-IL02)
(FJ-1:IL03-L05)
- Symposium FM (FM-1:IL02-IL03)
(FM-2:IL01-IL03)
- Conference FK (FK-1:IL01-IL03)
(FK-2:IL01-L04)
- Conference FL (FL-1:IL01-IL03)
(FL-1:IL04-IL06)
(FL-4:IL16)

15.00-19.00

POSTER MOUNTING

21.00-23.30
Opening Concert
"Opera Gran Galà"

Tuesday June 15

Morning: 8.30-13.00

- Symposium FA (FA-1.1:IL09-L13)
(FA-1.2:IL01-L04)
- Symposium FB (FB-1.2:IL01-IL05)
(FB-2.2:IL04-L07)
- Symposium FC (FC-1:IL07-L11)
(FC-2:IL01-L04)
- Symposium FD (FD-1:IL08-L10)
(FD-1:IL11-L15)
- Symposium FE (FE-1:IL09-L14)
(FE-2:IL05-L08)
- Symposium FF (FF-5:IL02-IL08)
(FF-10.1:IL01-L04)
(FF-10.1:IL05-L08)
- Symposium FG (FG-2:IL04-L07)
- Symposium FH (FH-1:IL01-L05)
- Symposium FI (FI-1:IL10-IL14)
(FI-1:IL15-L17)
- Symposium FJ (FJ-1:IL06-L10)
(FJ-2:IL01-L04)
- Symposium FM (FM-2:IL04-L08)
(FM-3:IL01-L03)
- Conference FK (FK-2:IL05-IL07)
(FK-3:IL01-IL03)
(FK-6:IL07)
- Conference FL (FL-1:IL07-IL10)
(FL-3:IL01-IL03)
(Award Talk by B. Ruozi)

Tuesday June 15

Afternoon: 15.00-19.30

- Symposium FB (FB-1.3:IL01-L06) *Joint Session with
Symposium FA*
(FB-2.3:IL01-IL04)
(FB-2.8:IL01-IL03)
- Symposium FC (FC-4:IL01-L04)
(FC-1:L17-L20)
- Symposium FD (FD-1:IL16-L19)
(FD-2:IL02-L04)
(FD-2:IL13)
- Symposium FE (FE-1:IL05-IL08)
(FE-2:IL09-L12)
- Symposium FF (FF-3:IL02-L07)
(FF-2:IL04-IL07)
(FF-10.2:IL01-L04)
- Symposium FG (FG-3:L16-L21)
- Symposium FH (FH-2:IL01-IL07)
- Symposium FI (FI-2:IL01-L05)
(FI-2:IL06-L10)
- Symposium FJ (FJ-1:IL11-L15)
- Symposium FM (FM-1:IL04-L05)
(FM-4:IL01-IL02)
- Conference FK (FK-1:L04-L06)
(FK-2:L09-L10)
(FK-3:IL05-IL11)
- Conference FL (FL-1:L14-L20)
(FL-1:L21-L24)
(FL-6:L05-L10)
(FL-4:L18-L20)

Wednesday June 16

Morning: 8.30-13.00

- Symposium FA (FA-1.2:IL07-IL08)
(FA-1.3:IL01-IL03)
- Symposium FB (FB-2.3:IL05-IL08)
(FB-2.4:IL01-IL03)
- Symposium FC (FC-3:IL01-IL06)
- Symposium FD (FD-2:IL05-L07)
(FD-2:L08-IL10)
- Symposium FE (FE-2:IL13-L16)
(FE-2:IL17-L20)
- Symposium FF (FF-4:IL02-IL04)
(FF-6:IL01)
(FF-8:IL01)
(FF-9:IL01-IL02)
(FF-10.2:IL06-L08)
(FF-10.3:IL01-L03)
- Symposium FG (FG-2:IL08-IL10)
(FG-3:IL01-L05)
- Symposium FH (FH-2:IL04-IL08)
(FH-3:IL02-L04)
- Symposium FI (FI-2:IL11-L14)
(FI-2:IL16-L20)
- Symposium FJ (FJ-2:L07-IL09)
(FJ-2:IL10-L12)
- Conference FK (FK-5:IL01-IL04)
(FK-6:IL01-L04)
- Conference FL (FL-1:L25-L30)
(FL-4:IL01-L08)

14.45-20.20 *Tour to Florence*

Special shuttle train reserved to CIMTEC participants
Meeting point: Montecatini Terme Central Railway Station
(Piazza Italia)
Meeting time: 14.45

Thursday June 17

Morning: 8.30-13.00

- Symposium FA (FA-1.5:IL01-L04)
(FA-1.4:IL01-IL03)
- Symposium FB (FB-2.5:IL01-IL05)
(FB-2.2:IL08-L10)
(FB-2.3:L09-L11)
- Symposium FD (FD-2:IL11-IL12)
(FD-3:IL01-IL03)
- Symposium FE (FE-2:IL21-L25)
(FE-2:IL26-L30)
- Symposium FF (FF-6:IL02-L04)
(FF-6:IL05-L08)
(FF-2:L08-L10)
(FF-5:IL06)
(FF-7:IL02-L06)
(FF-10.3:IL05-IL10)
- Symposium FG (FG-3:IL06-L10)
(FG-3:IL11-L15)
- Symposium FH (FH-4:IL01-L05)
(FH-3:IL01 and FH-3:IL07)
- Symposium FI (FI-2:IL21-L25)
(FI-2:IL26-L29)
- Symposium FJ (FJ-2:IL13-IL15)
(FJ-3:IL01-IL03)
- Symposium FM (FM-5:IL01-L04)
(FM-5:IL05-IL07)
- Conference FK (FK-4:IL01-IL03)
(FK-7:IL01-L05)
- Conference FL (FL-4:IL11-IL15)
(FL-5:L04-L06)

Thursday June 17

Afternoon: 15.00-20.00

Symposium FA (FA-2.2:IL01-IL04)
(FA-2.3:IL01-IL02)

Symposium FB (FB-2.3:L12-L17)
(FB-2.2:L12-L14)

Symposium FC (FC-5:IL01-L04)

Symposium FF (FF-6:L10-IL13)
(FF-8:IL04-IL05)

Symposium FG (FG-2:IL13-L15)
(FG-4:IL04-L06)

Symposium FI (FI-2:L30-L32)
(FI-3:IL02-L04)

Symposium FM (FM-6:IL01-L02)
(FM-7:L05-L06)

Conference FK (FK-8:IL02-IL04)

Conference FL (FL-2:IL01-L07)
(FL-1:L33-L34)
(FL-3:L04-L07)

18.30-20.00

POSTER DISCUSSION

Friday June 18

Morning: 8.30-13.00

- Symposium FA (FA-1.1:IL05-IL07)
(FA-2.2:IL05-IL08)
- Symposium FB (FB-2.6:IL01-IL05)
(FB-2.7:IL01-L05)
- Symposium FC (FC-1:IL12-IL13)
(FC-2:IL05-L11)
- Symposium FE (FE-3:IL01-L05)
(FE-1:IL01)
(FE-3:IL06-L10)
- Symposium FF (FF-6:IL19-L23)
(FF-2:IL06)
(FF-6:IL14-IL18)
(FF-7:IL08-IL11)
(FF-10.4:IL01-IL05)
(FF-10.5:IL02-IL03)
- Symposium FG (FG-3:IL22-L26)
(FG-4:IL01-IL03)
- Symposium FH (FH-4:IL06-IL09)
(FH-5:IL02-IL06)
- Symposium FI (FI-3:IL05-L09)
(FI-3:IL10-IL13)
- Symposium FJ (FJ-3:IL04-IL06)
(FJ-3:IL07-IL10)
- Symposium FM (FM-6:IL03-IL05)
(FM-7:IL02-IL04)
- Conference FK (FK-7:IL06-IL09)
(FK-8:IL05-IL06)
- Conference FL (FL-5:IL02-L03b)
(FL-6:IL02-IL04)

14.45-19.30

Tour to Pisa

Meeting point: Palazzo dei Congressi

Meeting time: 14.45

21.00-23.30

Conference Dinner

Lidò Le Panteraie

Via delle Panteraie, 26

SESSIONS FLOWSHEET

June 14-18

5th Forum on New Materials

Chair

Pietro Vincenzini
World Academy of Ceramics
National Research Council, Italy

Co-Chair

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

Programme Chairs

Symposium FA: **Cynthia Powell**, USA

Symposium FB: **Marco Vittori Antisari**, Italy

Symposium FC: **Vincenzo Antonucci**, Italy

Symposium FD: **Fausto Croce**, Italy

Symposium FE: **Kunihito Koumoto**, Japan

Symposium FF: **Hua-Tay Lin**, USA

Focused Session FF-10: **Kevin Fox**, USA

Symposium FG: **Nicola Romeo**, Italy

Symposium FH: **Mark Mehos**, USA

Symposium FI: **David S. Ginley**, USA

Symposium FJ: **Giovanni Bruno**, Italy

Symposium FM: **Nikolay I. Zheludev**, UK

Conference FK: **Attilio Rigamonti**, Italy

Conference FL: **John A. Jansen**, The Netherlands

OPENING SESSION

AUDITORIUM

9.30 - 10.15

Welcome

P. VINCENZINI

General Chair CIMTEC Conferences

R.P.H. CHANG

General Secretary

International Union of Materials Research Societies

A. MAKISHIMA

President International Ceramic Federation

Plenary Lectures

10.30 - 11.15

F:PL1

Graphene: Magic of Flat Carbon

A. GEIM

University of Manchester, UK

11.15 - 12.00

F:PL2

**Programmed Molecular Assembly for Tailored
Functional Materials**

T. AIDA

JST ERATO-SORST NANOSPACE PROJECT, Center for
Nanobio Integration, and Dept. of Chemistry &
Biotechnology, The University of Tokyo, Tokyo, Japan

12.00 - 12.45

F:PL3

**First Principles Multiscale Methods Applied
to Materials Science**

W.A. GODDARD, III

Materials and Process Simulation Center (MSC), California
Institute of Technology, Pasadena, CA, USA

SYMPOSIUM FA
Advanced Fossil Fuel Energy Technologies:
The Materials Demand

Sub-session FA-1.1 - Improved or New Materials

Room: **ALBA 2**

Chair: C. POWELL, USA (*Programme Chair*)

15.00 *Welcome*

15.10 *FA-1.1:IL01* **Materials Issues in Oxy-fuel Technology for Carbon Capture and Storage**

T. WALL, Chemical Engineering, University of Newcastle, Callaghan, NSW, Australia

15.40 *FA-1.1:IL02* **New Metallic Materials for Advanced Fossil Fuel Power Generation**

W.J. QUADAKKERS, Forschungszentrum Jülich, IEF2, Jülich, Germany

16.10 *FA-1.1:IL04* **Control of Microstructure and Defects in Cast TiAl**

R. YANG, Y.Y. CUI, Q. JIA, R.H. LIU, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China

16.40 *Break*

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

Room: **ALBA 2**

Chair: T. WALL, Australia

17.10 *FA-2.1:IL01* **New Ways of Understanding Site Structure and Function in Fuel Production Catalysts**

J.P.H. LI, I. SULEIMAN, A. STAFFORD, M. STOCKENHUBER, University of Newcastle, Chemical Engineering, Priority Research Centre for Energy, Callaghan, NSW, Australia

17.40 *FA-2.1:IL02* **Water Gas Shift Reaction: From Conventional Catalytic Systems to Pd-based Membrane Reactors**

A. BASILE, A. IULIANELLI, ITM-CNR, c/o University of Calabria, Rende (CS), Italy

18.10 *FA-2.1:IL03* **Reactors with Integrated Separation by Membranes**

O. GÖRKE, J. THORMANN, P. PIERMARTINI, P. PFEIFER, R. DITTMAYER, Institute for Micro Process Engineering (IMVT), Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

MONDAY JUNE 14 AFTERNOON

SYMPOSIUM FB Materials and Process Innovations in Hydrogen Production and Storage

Sub-session FB-1.1 - Thermochemical H₂ Production

Room: AUDITORIUM

Chair: M. VITTORI ANTISARI, Italy (*Programme Chair*)

15.00 *Welcome*

15.10 *FB-1.1:IL01* **State-of-the-art of Thermo-chemical Hydrogen Production**

J. KELLER, Hydrogen and Combustion Technologies, Sandia National Laboratories, Livermore, CA, USA

15.40 *FB-1.1:IL02* **Hydrogen Production by the Thermochemical Cycle Based on Mixed Na-Mn Ferrites**

C. ALVANI, A. LA BARBERA, F. PADELLA, F. VARSANO, ENEA - C.R. Casaccia, Rome, Italy

16.10 *FB-1.1:IL03* **Two-step Thermochemical Cycles for High-temperature Solar Hydrogen Production**

T. KODAMA, Dept. of Chemistry & Chem. Eng., Niigata Univ., Niigata, Japan

16.40 *FB-1.1:IL04* **Coupling a Biomass Gasification Plant with the NIS Thermochemical Cycle for Hydrogen Production**

P.P. PROSINI, G. CAPUTO, A. GIACONIA, S. SAU, ENEA, Rome, Italy

17.00 *Break*

Sub-session FB-2.2 - Metal Hydrides

Room: AUDITORIUM

Chair: J.K. JOHNSON, USA

17.30 *FB-2.2:IL01* **Hydrogen Storage in Metastable Lightweight Hydrides**

K. KADIR, D. MOSER, D. NOREUS, Structural Chemistry, Stockholm University, Stockholm, Sweden

18.00 *FB-2.2:IL02* **Developments in Magnesium-based Hydrides**

J. HUOT, Hydrogen Research Institute, Université du Québec a Trois-Rivieres, Trois-Rivieres, Quebec, Canada

18.30 *FB-2.2:IL03* **Hydrogen Storage in Destabilized Borohydride Materials**

A.J. GOUDY, A. IBIKUNLE, T. DUROJAIYE, Dept. of Chemistry, Delaware State University, Dover, DE, USA

**SYMPOSIUM FC
Fuel Cells**

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

Room: **VENERE**

Chair: V. ANTONUCCI, Italy (*Programme Chair*)

15.00 *Welcome*

15.10 *FC-1:IL04* **Status of SOFC Cell Materials - Possibilities for Significant Improvements During the EU 7th Framework Programme**

R. STEINBERGER-WILCKENS, Forschungszentrum Jülich GmbH, Jülich, Germany

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

16.10 *FC-1:IL06* **Chromium Deposition and Poisoning at Solid Oxide Fuel Cell Cathodes - How Much do we Know?**

SAN PING JIANG, XINGBIN CHEN, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

16.40 *Break*

Chair: T. RIESS, Israel

17.10 *FC-1:IL01* **Progress Towards Redox-stable Anode-supported Solid Oxide Fuel Cells**

F. TIETZ, Forschungszentrum Jülich GmbH, IEF-1, Jülich, Germany; **QIANLI MA**, **A. LEONIDE**, **E. IVERS-TIFFÉE**, Karlsruhe Institute of Technology, IWE, Karlsruhe, Germany

17.40 *FC-1:IL02* **Principle of Mixed Reactant Fuel Cells and Ways to Achieve the Required Catalytic Selectivity**

I. RIESS, Physics Department, Technion-IIT, Haifa, Israel

18.10 *FC-1:IL03* **Direct-fueled Solid Oxide Fuel Cells Using a Multi-layered Anode with Different Porosities**

CHUNG MIN AN¹, **INYONG KANG**², **N. SAMMES**¹, ¹Dept. of Metallurgical and Materials Eng., Colorado School of Mines, Golden, CO, USA; ²Dept. of Chemical Eng., Colorado School of Mines, Golden, CO, USA

MONDAY JUNE 14 AFTERNOON

SYMPOSIUM FD Electrochemical Energy Storage Systems

Session FD-1 - Chemical Storage

Room: GIOVE

Chair: F. CROCE, Italy (*Programme Chair*)

15.00 *Welcome*

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

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

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

16.40 *Break*

Chair: P.H.L. NOTTEN, The Netherlands

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

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

MONDAY JUNE 14 AFTERNOON

SYMPOSIUM FE

Advances in Materials and Technologies for Efficient Direct Thermal-to-electrical Energy Conversion

Session FE-1 - Theoretical Concepts and Basic Approaches

Room: URANO

Chair: K. KOUMOTO, Japan (*Programme Chair*)

15.00 *Welcome*

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

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

16.10 *Break*

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

Room: URANO

Chair: J.-P. FLEURIAL, USA

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

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

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

18.00 *FE-2:L04* **Effect of Co-substitution on the Structure and Thermoelectric Properties of Chimney-ladder Solid Solution (Mn_{1-x}Cox)Siy (y ~ 1.7)**
Y. MIYAZAKI, Y. SAITO, K. HAYASHI, K. YUBUTA, T. KAJITANI, Dept. of Applied Physics, Tohoku University, Sendai, Japan; Institute for Materials Research, Tohoku University, Katahira, Sendai, Japan

MONDAY JUNE 14 AFTERNOON

SYMPOSIUM FG Photovoltaic Solar Energy Conversion

Room: LE PLEIADI

Chair: M. ROMEO, Italy (*Programme Chair*)

15.00 *Welcome*

15.10 *Keynote Lecture*

FG:KL Sustainable Energy by Mesoscopic Solar Cells

M. GRÄTZEL, A. McEVOY, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

Session FG-1 - Crystalline Cells

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

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

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

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

17.40 *Break*

Session FG-2 - Thin-film Photovoltaics

Room: LE PLEIADI

Chair: M. KONAGAI, Japan

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

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

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

SYMPOSIUM FI

Transparent Conducting and Semiconducting Oxides

Session FI-1 - Fundamentals

Room: SIRIO

Chair: D.S. GINLEY, USA (*Programme Chair*)

15.20 *Welcome*

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

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

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

16.50 *FI-1:L08 Intrinsic Defects of Transparent Conducting Oxides: A Comparative Hybrid-Functional Study of In₂O₃, SnO₂ and ZnO*
P. ÁGOSTON, A. KLEIN, K. ALBE, Institut für Materialwissenschaft, TU Darmstadt, Darmstadt, Germany; R.M. NIEMINEN, M.J. PUSKA, Dept. of Applied Physics, Helsinki University of Technology, Finland

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

SYMPOSIUM FJ
Materials and Technologies for Solid State Lighting

Session FJ-1 - Material Growth and Processing

Room: ORSA MAGGIORE

Chair: G. BRUNO, Italy (*Programme Chair*)

16.00 *Welcome*

16.05 *FJ-1:IL01 GaN Optoelectronics on Silicon*

A. DADGAR, Otto-von-Guericke-Universität Magdeburg, FNW-IEP, Magdeburg, Germany

16.35 *FJ-1:IL02 Synthesis of Electroluminescent Organic and Organometallic Materials: Tuning Emission Colour by Molecular Design*

G.M. FARINOLA, Chemistry Department, University of Bari, Bari, Italy

17.05 *Break*

Chair: A. HOFFMANN, Germany

17.30 *FJ-1:IL03 Zinc Oxide; Bulk Growth, Hydrogen and Schottky Diodes*

B.G. SVENSSON¹, R. SCHIFANO¹, K.M. JOHANSEN¹, L. VINES¹, V. QUEMENER¹, P. NEUVONEN¹, K.E. KNUTSEN¹, H.B. NORMANN¹, H. HAUG¹, M. KVALBEIN¹, A. GALECKAS¹, A.YU. KUZNETSOV¹, E.V. MONAKHOV¹, F. TUOMISTO², W. MTANGI³, F.D. AURET³, ¹Dept. of Physics/Center for Materials Science and Nanotechnology, University of Oslo, Blindern, Oslo, Norway; ²Lab. of Physics, Helsinki University of Technology, TKK, Finland; ³Dept. of Physics, University of Pretoria, Pretoria, South Africa

18.00 *FJ-1:L04 Catalyst-assisted MOVPE Self-assembly and Properties of Free-standing III-V Nanowires*

P. PRETE, IMM-CNR, Lecce, Italy; **N. LOVERGINE**, Dept. Innovation Engineering, University of Salento, Lecce, Italy

18.20 *FJ-1:L05 Growth of GaN Nanostructures by Halide Vapor Phase Epitaxy*

C. HEMMINGSSON, G. POZINA, B. MONEMAR, Dept. of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden

SYMPOSIUM FM
Electromagnetic Metamaterials

Session FM-1 - Microwave and THz Metamaterials

Room: ORSA MINORE

Chair: N.I. ZHELUDEV, UK (*Programme Chair*)

15.30 *Welcome*

15.40 **FM-1:IL02 Terahertz Metamaterials Under a Near-field Microscope**

A. BITZER, A. ORTNER, M. WALTHER, Molecular and Optical Physics, University of Freiburg, Freiburg, Germany

16.10 **FM-1:IL03 New Concepts for Spoof Surface Plasmon Metamaterials**

S.A. MAIER, A. FERNANDEZ-DOMINGUEZ, Physics Department, Imperial College London, London, UK

16.40 *Break*

Session FM-2 - Photonic and Infrared Metamaterials

Room: ORSA MINORE

Chair: M. WEGENER, Germany

17.10 **FM-2:IL01 Metamaterials: Going from Microwaves to Optics**

M. KAFESAKI, R. PENCIU, FORTH-IESL, Heraklion, Greece; Th. KOSCHNY, Iowa State University, USA; E.N. ECONOMOU, FORTH-IESL and University of Crete, Greece; C.M. SOUKOULIS, FORTH-IESL, Univ. of Crete, Greece, and Iowa State University, USA

17.40 **FM-2:IL02 Light Propagation in Optical Metamaterials**

F. LEDERER, T. PAUL, C. ROCKSTUHL, C. MENZEL, University of Jena, Institute of Condensed Matter Theory and Optics, Jena, Germany

18.10 **FM-2:IL03 Optics of Active Metamaterials**

A.K. SARYCHEV, Institute for Theoretical and Applied Electrodynamics, Moscow, Russia

MONDAY JUNE 14 AFTERNOON

SYMPOSIUM FF Materials Challenges for Future Nuclear Fission and Fusion Technologies

Room: **SMERALDO 1**

Chair: Hua-Tay LIN, USA (*Programme Chair*)

15.00 *Welcome*

15.10 *Keynote Lecture*

**FF:KL Crosscutting Materials Issues for Next-generation
Fission and Fusion Energy Systems**

S.J. ZINKLE, Materials Science and Technology Division, Oak Ridge
National Laboratory, Oak Ridge, TN, USA

Session FF-1 - Structural Components for Fission and Fusion Applications

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

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

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

17.20 *Break*

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

Room: **SMERALDO 1**

Chair: Ji-Jung KAI, Taiwan

- 17.50 *FF-2:IL01* **RAFM Steel Materials for DEMO: Properties After Irradiation**
A. MÖSLANG, Karlsruhe Institute of Technology (KIT), Institute of Materials Research I (IMF1), Eggenstein-Leopoldshafen, Germany
- 18.20 *FF-2:IL02* **Super ODS Steels R&D for Cladding Material of Next Generation Nuclear Systems**
A. KIMURA¹, R. KASADA¹, N. IWATA¹, J. ISSELIN¹, P. DOU¹, J.H. LEE¹, T. OKUDA², M. INOUE³, S. UKAI⁴, S. OHNUKI⁴, T. FUJISAWA⁵, F. ABE⁶, ¹Institute of Advanced Energy, Kyoto University, Kyoto; ²KOBELCO Research Institute, Kobe; ³Japan Atomic Energy Agency, Oarai, Ibaraki; ⁴Hokkaido University, Sapporo; ⁵Nagoya University, Nagoya; ⁶National Institute of Materials Science, Tsukuba, Japan
- 18.50 *FF-2:IL03* **Development of Nanostructured Ferritic Alloys**
D. HOELZER, J. BENTLEY, M.K. MILLER, M.A. SOKOLOV, Oak Ridge National Laboratory, Oak Ridge, TN, USA; M. LI, Argonne National Laboratory, Argonne, IL, USA

MONDAY JUNE 14 AFTERNOON

CONFERENCE FK Science and Engineering of Novel Superconductors

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

Room: **SMERALDO 2**

Chair: A. RIGAMONTI, Italy (*Programme Chair*)

15.00 *Welcome*

15.10 *FK-1:IL01 Insight in High-temperature Superconductivity from Cuprate Heterostructures*

A. GOZAR, I. BOZOVIC, Brookhaven National Laboratory, Upton, NY, USA

15.40 *FK-1:IL02 Electric Field Induced Superconductivity*

Y. IWASA, Institute for Materials Research, Tohoku University, Sendai, Japan

16.10 *FK-1:IL03 Structure and Electrical Properties of the Interface Between LaAlO₃ and SrTiO₃*

A. KALABUKHOV, R. GUNNARSSON, D. WINKLER, T. CLAESON, J. BÖRJESSON, N. LJUSTINA, E. OLSSON, Chalmers University of Technology, Göteborg, Sweden; Y. BOIKOV, I. SERENKOV, V. SAKHAROV, Ioffe Physico-Technical Institute, St Petersburg, Russian Federation; V. POPOK, University of Gothenburg, Göteborg, Sweden

16.40 *Break*

Session FK-2 - Pnictides

Room: **SMERALDO 2**

Chair: K.A. YATES, UK

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

17.40 *FK-2:IL02 Point-contact Andreev-reflection Spectroscopy and Electron-boson Coupling in Superconducting Pnictides*

R.S. GONNELLI, D. DAGHERO, M. TORTELLO, G.A. UMMARINO, Dip. di Fisica and CNISM, Politecnico di Torino, Torino, Italy; V.A. STEPANOV, P.N. Lebedev Physical Inst., RAS, Moscow, Russia; R.K. KREMER, Max-Planck Inst. for Solid-State Research, Stuttgart, Germany; J. KARPINSKI, N.D. ZHIGADLO, Lab. for Solid-State Physics, ETH, Zurich, Switzerland; JIANYI JIANG, Appl. Superc. Center, National High Magnetic Field Lab., Tallahassee, USA

18.10 *FK-2:IL03 NMR Studies of the New Iron Pnictide Superconductors*

H.-J. GRAFE, G. LANG, F. HAMMERATH, D. PAAR, K. MANTHEY, G. BEHR, J. WERNER, B. BÜCHNER, IFW Dresden, Institute for Solid State Research, Dresden, Germany

18.40 *FK-2:L04 Iron Pnictide Thin Film Hybrid Josephson Junctions*

P. SEIDEL¹, F. SCHMIDL¹, S. DÖRING¹, M. KIDSZUN², S. HAINDL², L. SCHULTZ², B. HOLZAPFEL², ¹Friedrich-Schiller-Universität Jena, Institut für Festkörperphysik, Jena, Germany; ²IFW Dresden, Institute for Metallic Materials, Dresden, Germany

MONDAY JUNE 14 AFTERNOON

CONFERENCE FL Medical Applications of Novel Biomaterials and Nano-biotechnology

Session FL-1 - Advances in Biomaterials

Room: **SMERALDO 3**

Chair: J.A. JANSEN, The Netherlands (*Programme Chair*)

15.00 *Welcome*

15.10 *FL-1:IL01 Nanostructural Control of Bioceramics and the Merger of Devices with Biologicals*

P. DUCHEYNE, Center for Bioactive Materials and Tissue Engineering, University of Pennsylvania, Philadelphia, PA, USA

15.40 *FL-1:IL02 Essential Factors to Make Excellent Biocompatibility of Phospholipid Polymer Materials*

K. ISHIHARA, T. KONNO, Y. INOUE, Dept. of Materials Engineering, The University of Tokyo, Tokyo, Japan, and CREST, Japan Science and Technology Agency, Japan

16.10 *FL-1:IL03 Biomedical Applications of Peptide-polymer Conjugates Self-assemblies*

C. SANSON^{1,2}, K.K. UPADHYAY^{1,2,3}, A. MISRA³, C. SCHATZ^{1,2}, J.-F. LE MEINS^{1,2}, **S. LECOMMANDOUX**^{1,2}, ¹Université de Bordeaux, UMR5629, ENSCPB, Pessac, France; ²CNRS, Lab. de Chimie des Polymères Organiques, UMR5629, Pessac, France; ³Pharmacy Dept., Kalabhavan, M.S. Univ. of Baroda, Vadodara, Gujarat, India

16.40 *Break*

Chair: P. DUCHEYNE, USA

17.10 *FL-1:IL04 Development of Cardiovascular Implants Using Nanocomposite Polymer and Stem Cell Technology: From Lab to Commercialisation*

A.M. SEIFALIAN, A. DEMEL, H. GHANBARI, M. AHMED, A. DARBYSHIRE, Centre for Nanotechnology, Biomaterials & Tissue Engineering, UCL Division of Surgery & Interventional Science, University College London, UK

17.40 *FL-1:IL05 Supramolecular Surfaces Modulating Cellular Response*

N. YUI, R. KATOONO, D.H. YANG, Japan Advanced Institute of Science and Technology, Ishikawa, and JST CREST, Tokyo, Japan

18.10 *FL-1:IL06 Molecular Modelling and Experimental Investigation of Hydrolytically Degradable Polymeric Biomaterials*

D. HOFMANN^{1*}, M. ENTRIALGO^{1,2}, J. REICHE³, K. KRATZ^{1,4}, A. LENDLEIN^{1,4}, ¹Center for Biomaterial Development, Inst. of Polymer Research, GKSS Research Center, Teltow, Germany; ²present address: Accelrys Inc., Cambridge, UK; ³Universität Potsdam, Inst. for Physics and Astronomie, Potsdam-Golm, Germany; ⁴Berlin Brandenburg Centre for Regenerative Therapies, Berlin, Germany

18.40 *FL-4:IL16 Tissue Engineering Technology with Biomaterials to Develop Regeneration Medicine and Stem Cell Biology*

Y. TABATA, Dept. of Biomaterials, Inst. for Frontier Medical Sciences, Kyoto University, Kyoto, Japan

(rescheduled time from Session FL-4 as for Author request)

Sub-session FA-1.1 - Improved or New Materials

Room: **ALBA 2**

Chair: I.E. ANDERSON, USA

- 8.50 *FA-1.1:IL09* **Alloy Design and Processing Challenges for Advanced Power Systems: an Alloy Producer's Perspective**
G.E. MAURER, A.D. PATEL, Carpenter Technology Corporation, Reading, PA, USA
- 9.20 *FA-1.1:IL10* **Computational and Experimental Development of Novel High Temperature Alloys**
M.J. KRAMER, M. AKINC, P. RAY, Ames Laboratory and Dept. of Materials Science and Engineering, Iowa State University, Ames, Iowa, USA
- 9.50 *FA-1.1:L12* **Reaction Synthesis Mo-Si-B Alloys; Strength, Oxidation, Microstructural Engineering**
J.K. COCHRAN, M.R. MIDDLEMAS, W.L. DALOZ, P.E. MARSHALL, Georgia Tech, Atlanta, GA, USA; K.S. KUMAR, P. JAIN, Brown University, Providence, RI, USA
- 10.10 *FA-1.1:L13* **Effect of Alloying Elements on Phase Equilibria in New Co-based Superalloy**
T. OMORI, J. SATO, K. OIKAWA, I. OHNUMA, R. KAINUMA, K. ISHIDA, Dept. of Materials Science, Tohoku University, Sendai, Japan
- 10.30 *Break*

Sub-session FA-1.2 - Membranes for O₂ Separation and Adsorbents for CO₂ Capture

Room: **ALBA 2**

Chair: J.E. OAKEY, UK

- 11.00 *FA-1.2:IL01* **Oxygen Transport Membranes for Oxyfuel Combustion**
W. HAIJE, Energy Research Centre of the Netherlands, ECN, Petten, The Netherlands
- 11.30 *FA-1.2:IL02* **Commercially Reliable Oxygen Conducting Membranes for SOFC and Oxygen Generation Applications**
V. SPRENKLE, Pacific Northwest National Laboratory (PNNL), Richland, WA, USA
- 12.00 *FA-1.2:IL03* **Oxygen Carriers for Chemical-looping Combustion**
T. MATTISSON, A. LYNDFELT, M. RYDEN, Dept. of Energy and Environment, Chalmers University of Technology, Göteborg, Sweden
- 12.30 *FA-1.2:L04* **Supported Oxygen Transport Membranes for Oxyfuel Power Plants**
M. BETZ, F. SCHULZE-KÜPPERS, S. BAUMANN, W.A. MEULENBERG, D. STÖVER, Forschungszentrum Jülich, Institute of Energy Research IEF-1 Materials Synthesis and Processing, Jülich, Germany

TUESDAY JUNE 15 MORNING

Sub-session FB-1.2 - Photoelectrochemical and Photo-biological H₂ Production

Room: AUDITORIUM

Chair: Shin-ichi ORIMO, Japan

- 8.50 *FB-1.2:IL01* **Development of Photocatalysts for Water Splitting Under Visible Light**
K. DOMEN, School of Engineering, The University of Tokyo, Tokyo, Japan
- 9.20 *FB-1.2:IL03* **Photoelectrochemistry of Complex Metal Oxides**
R. VAN DE KROL, Dept. of DelftChemTech, Delft University of Technology, Delft, The Netherlands
- 9.50 *FB-1.2:IL04* **Hybrid Assemblies for Solar-driven Hydrogen Production**
K. BROWN, D. SVEDRUZIC, J. BLACKBURN, S. DAYAL, G. RUMBLES, M.L. GHIRARDI, P.W. KING, National Renewable Energy Laboratory, Golden, CO, USA; M. HEBEN, University of Toledo, Toledo, OH, USA
- 10.20 *FB-1.2:IL05* **Bio-inspired Approaches to Solar Hydrogen Production**
D. GUST, T.A. MOORE, A.L. MOORE, Dept. of Chemistry and Biochemistry, Arizona State University, Tempe, AZ, USA
- 10.50 *Break*

Sub-session FB-2.2 - Metal Hydrides

Room: AUDITORIUM

Chair: D. NOREUS, Sweden

- 11.20 *FB-2.2:IL04* **Computational Modelling of Destabilized Hydride Systems**
J.K. JOHNSON, A. KULKARNI, University of Pittsburgh, Pittsburgh, PA, USA; KI CHUL KIM, D. SHOLL, Georgia Institute of Technology, USA
- 11.50 *FB-2.2:IL05* **Destabilization of Mg Hydrides by Mechanical Constraint**
R. GRIESSEN, A. BALDI, Y. PIVAK, Dept. of Physics and Astronomy, Condensed Matter Physics, VU University Amsterdam, Amsterdam, The Netherlands
- 12.20 *FB-2.2:L06* **From Lab Scale Optimization of Mg-based Composites for H₂ Storage to the Realization of a Portable Prototype**
C. MILANESE, A. GIRELLA, G. BRUNI, V. BERBENNI, A. MARINI, CSGI - Dept. of Physical Chemistry, University of Pavia, Pavia, Italy; P. MATTEAZZI, MBN Nanomaterialia S.p.A., Vascon di Carbonera (TV), Italy
- 12.40 *FB-2.2:L07* **In-situ Study of the Effect of Internal Stress on the Hydriding Kinetics of Pd-based Thin Film Systems**
R. DELMELLE, S. MICHOTTE, J. PROOST, Inst. of Mechanics, Materials and Civil Eng., Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium

TUESDAY JUNE 15 MORNING

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

Room: **VENERE**

Chair: L.C. DE JONGHE, USA

- 8.50 *FC-1:IL07* **Low-temperature SOFC Development**
B. RIETVELD, F. VAN BERKEL, YE ZHANG-STEENWINKEL, ECN, Petten, The Netherlands; E. BOUYER, CEA, France; J. IRVINE, University St. Andrews, UK; M. MENON, Risoe-DTU, Denmark; L. NIEWOLAK, S. GROSS, FZJ, Germany; A. HEEL, P. HOLTAPPELS, EMPA, Switzerland; S. MODENA, HTceramix, Switzerland
- 9.20 *FC-1:IL08* **Electrochemical Processes Around three Phase Boundary Area in SOFC Electrodes**
K. EGUCHI, Kyoto University, Kyoto, Japan
- 9.50 *FC-1:L09* **Electrochemical Characteristics of Thin Film Electrodes of SOFC Grown by PLD**
M. OTANI, S. TSUKUI, Y. UMEZAKI, T. MUKAI, Dept. of Chemical Engineering, Osaka Prefecture University, Osaka, Japan; K. YOSHIDA, Division of General Education, Tokyo Metropolitan College of Industrial Technology, Tokyo, Japan
- 10.10 *FC-1:L10* **Long-Term Study of MIEC Cathodes for intermediate temperature Solid Oxide Fuel Cells**
C. ENDLER, A. LEONIDE, A. WEBER, E. IVERS-TIFFÉE, Inst. für Werkstoffe der Elektrotechnik, Karlsruher Institut für Technologie (KIT), Karlsruhe, Germany; F. TIETZ, Inst. of Energy Research (IEF-1), Forschungszentrum Jülich, Germany
- 10.30 *FC-1:L11* **High Performance and Long-term Stability of Ni/GDC Based SOFC Unit Cells Operated at Low Temperature Using CH₄ Fuel**
JONG-JIN LEE, HYUN JONG CHOI, HYUN JUN KO, JAE-HA MYUNG, SANG-HOON HYUN, School of Advanced Materials Science & Engineering, Yonsei University, Seoul, Korea
- 10.50 *Break*

Session FC-2 - Polymer Electrolyte Fuel Cells

Room: **VENERE**

Chair: Kimihisa YAMAMOTO, Japan

- 11.20 *FC-2:IL01* **High Temperature Polymer Electrolyte Fuel Cells: Prospects and Challenges**
G. BANDLAMUDI, P. BECKHAUS, J. BURFEIND, A. HEINZEL, Centre for Fuel Cell Technology, Germany University of Duisburg-Essen, Germany
- 11.50 *FC-2:L04* **Mesoporous Tungsten Oxide with Mixed Electron and Proton Conductivity**
G. ORSINI, V. TRICOLI, Università di Pisa, Dipartimento di Ingegneria Chimica e Scienza dei Materiali, Pisa, Italy
- 12.10 *FC-2:IL02* **Status on New Materials Development for the ORR for PEM Fuel Cell Applications**
O. SAVADOGO, Laboratory of New Materials for Electrochemistry and Energy, École Polytechnique de Montréal, Montréal, Québec, Canada

Session FD-1 - Chemical Storage

Room: GIOVE

Chair: S.G. GREENBAUM, USA

- 9.00 *FD-1:IL08* **Lithium Nitrides as New Anode Materials for Lithium-ion Batteries**
D.H. GREGORY, WestCHEM, Dept. of Chemistry, University of Glasgow, Glasgow, UK
- 9.30 *FD-1:L09* **A Safe, High-rate and High-energy Polymer Lithium-ion Battery Based on Gelled Membrane Prepared by Electrospinning**
F. CROCE¹, M.L. FOCARETE², J. HASSOUN³, I. MESCHINI¹, B. SCROSATI³, ¹Dip. di Scienze del Farmaco, Università "G.D'annunzio", Chieti, Italy; ²Dip. di Chimica "G. Ciamician", Università di Bologna, Bologna, Italy; ³Dip. di Chimica, Università "La Sapienza", Rome, Italy
- 9.50 *FD-1:L10* **Study of Carbon Nanotubes for Lithium-ion Batteries Applications**
A. VARZI, C. TÄUBERT, M. WOHLFAHRT-MEHRENS, ZSW-Center for Solar Energy and Hydrogen Research, Ulm, Germany; M. KREIS, W. SCHÜTZ, FutureCarbon GmbH, Bayreuth, Germany
- 10.10 *Break*
- Chair:* D.H. GREGORY, UK
- 10.40 *FD-1:IL11* **On the Road Towards 3D-integrated All-solid-state Batteries**
P.H.L. NOTTEN, Eindhoven University of Technology and Philips Research Laboratories, Eindhoven, The Netherlands
- 11.10 *FD-1:IL12* **Materials for Aqueous Rocking-chair Batteries**
Q.T. QU¹, Y. SHI¹, S. TIAN¹, YUPING WU¹, R. HOLZE², ¹NEML, Dept. of Chemistry and Shanghai Key Lab. of Molecular Catalysis & Innovative Materials, Fudan University, Shanghai, China; ²Technische Universität Chemnitz, Institut für Chemie, Chemnitz, Germany
- 11.40 *FD-1:L13* **Solid State and Aqueous Li-ion Batteries with Polyanionic Electrode Active Materials**
SHIGETO OKADA, SUN IL PARK, EIJI KOBAYASHI, JUN-ICHI YAMAKI, Inst. for Materials Chemistry and Engineering, Kyushu University, Fukuoka, Japan
- 12.00 *FD-1:L14* **Activation of Phosphate Olivines LiMPO₄ (M = Fe, Mn) by Functionalized Carbon Nanotubes: Application for Cathode Materials of Li-Ion Battery**
L. KAVAN, J. Heyrovský Institute of Physical Chemistry, v.v.i., Academy of Sciences of the Czech Republic, Prague, Czech Republic
- 12.20 *FD-1:L15* **Sago Based Gel Polymer Electrolyte for Zinc-Air Battery**
M.N. MASRI, A.A. MOHAMAD, School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia, Nibong Tebal, Penang, Malaysia

TUESDAY JUNE 15 MORNING

Session FE-1 - Theoretical Concepts and Basic Approaches

Room: URANO

Chair: P. ROGL, Austria

- 8.30 **FE-1:IL09 Zintl Chemistry for Designing High Efficiency Thermoelectric Materials**
G.J. SNYDER, California Institute of Technology, Pasadena, CA, USA
- 9.00 **FE-1:IL10 Strategy for Thermoelectric Application**
R. FUNAHASHI, S. URATA, Y. MATSUMURA, K. IWASAKI, A. KOSUGA, National Institute of Advanced Industrial Science and Technology, Ikeda, Osaka, Japan; T. URATA, CREST, Japan Science and Technology Agency, Chiyoda, Tokyo, Japan
- 9.30 **FE-1:L11 Development of Nanocrystalline Thermoelectric Films of p-type Bi₂Te₃ Based Compound**
S. JARBY, R. BAR, V. EZERSKY, V. KASIYAN, Z. DASHEVSKY, Dept. of Matls Eng., Ben-Gurion University of the Negev, Beer-Sheva, Israel
- 9.50 **FE-1:L12 Thermoelectric Iron Oxides**
T. KAJITANI, T. NOZAKI, K. HAYASHI, Dept. of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan
- 10.10 **FE-1:L13 Macro to Micro Derivation of the Thermoelectric Thermodynamics**
Y. APERTET¹, C. GOUPIL², P. LECOEUR¹, ¹Inst. d'Electronique Fondamentale Bat. 220, Université Paris Sud, Orsay, France; ²CRISMAT CNRT, Caen, France
- 10.30 **FE-1:L14 Theoretical Performance Characteristics of Wearable Thermoelectric Generators**
V. LEONOV, IMEC, Leuven, Belgium
- 10.50 *Break*

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

Room: URANO

Chair: G. CHEN, USA

- 11.20 **FE-2:IL05 Recent Advances in High Temperature Thermoelectric Generating Technology**
J.-P. FLEURIAL, T. CAILLAT, E. BRANDON, J. PAK, V. RAVI, P. GOGNA, Jet Propulsion Laboratory/California Institute of Technology, Pasadena, CA, USA
- 11.50 **FE-2:IL06 Clathrates: A Challenge for Thermoelectricity?**
P.F. ROGL, Institute of Phys. Chem., University of Vienna, Vienna, Austria
- 12.20 **FE-2:L07 Effect of Annealing on High Temperature Thermoelectric Performance of ZrNiSn Half-Heusler Compounds**
PENGFEI QIU, JIONG YANG, XIANGYANG HUANG, LIDONG CHEN, CAS Key Lab. of Materials for Energy Conversion, Shanghai Institute of Ceramics, CAS, Shanghai, P.R. China
- 12.40 **FE-2:L08 Non-contact Optical Method for Measuring Thin Film Lattice Temperatures**
P.J. McCANN, L. OLONA, J.D. JEFFERS, J. GREGO, ZHIHUA CAI, School of Electrical and Computer Eng., Univ. of Oklahoma, Norman, OK, USA; ZHIXI BIAN, Baskin School of Eng., Univ. of California, Santa Cruz, CA, USA

TUESDAY JUNE 15 MORNING

Session FG-2 - Thin-film Photovoltaics

Room: LE PLEIADI

Chair: Kenji YAMAMOTO, Japan

- 8.50 *FG-2:IL04* **Thin Film Full Spectrum Solar Cells with Low Concentration Ratios**
M. KONAGAI, Photovoltaics Research Center, Tokyo Institute of Technology, Tokyo, Japan
- 9.20 *FG-2:IL05* **Crystalline Silicon Thin Films Solar Cells on Foreign Substrates: Potential and Challenges**
A. SLAOUI, Institut d'Electronique du Solide et des Systemes (InESS) UMR 7163 CNRS - UdS, Strasbourg, France
- 9.50 *FG-2:L06* **Broadband Absorption Enhancement Using Unique Nanostructures**
YALIN LU, Laser Optics Research Center, Dept. of Physics, United States Air Force Academy, Colorado Springs, CO, USA
- 10.10 *FG-2:L07* **In-situ Internal Stress Measurements During Sputter Deposition of Metallic Oxide Thin Films for Photovoltaic Applications**
S. MICHOTTE, Q. VAN OVERMEERE, J. PROOST, Institute of Mechanics, Materials and Civil Engineering, Université Catholique de Louvain (UCL), Louvain-la-Neuve, Belgium
- 10.30 *Break*

**SYMPOSIUM FH
Concentrating Solar Technologies**

**Session FH-1 - New Developments in Materials, and
CPV Optics and Thermal Management**

Room: **LE PLEIADI**

Chair: M. MEHOS, USA (*Programme Chair*)

11.00 *Welcome*

11.10 *FH-1:IL01* **III-V Multijunction Solar Cells for Ultra High Concentrations**

C. ALGORA, Instituto de Energía Solar-Universidad Politécnica de Madrid ETSI Telecomunicación, Madrid, Spain

11.40 *FH-1:IL02* **Improved Concentration Capabilities of Flat-plate Fresnel Lenses**

M.Z. SHVARTS, Ioffe Physical Technical Institute, St. Petersburg, Russia; **A.A. SOLUYANOV**, Technoexan LTD, St. Petersburg, Russia

12.10 *FH-1:L04* **Optical Methods for Indoor Characterization of Small Size Solar Concentrators**

A. PARRETTA, ENEA, Centro Ricerche "E. Clementel", Bologna (BO), Italy; **A. ANTONINI**, **M.A. BUTTURI**, **P. DI BENEDETTO**, **D. UDERZO**, **P. ZURRU**, CPower SRL, Ferrara (FE), Italy; **G. MARTINELLI**, Università di Ferrara, Dipartimento di Fisica, Ferrara, Italy

12.30 *FH-1:L05* **Assessment of a Phase Change Material System for Moderating Temperature Rise of Solar Cells Under Concentrated Sunlight**

E. CASENOVE, **L. PUJOL**, **A. VOSSIER**, **A. PERONA**, **V. GOETZ**, **A. DOLLET**, CNRS, PROMES Laboratory, Perpignan and Odeillo, France

TUESDAY JUNE 15 MORNING

Session FI-1 - Fundamentals

Room: SIRIO

Chair: K. ELLMER, Germany

- 8.50 *FI-1:IL10* **Amorphous In-Zn-O Films: Archetype for a New Class of TCO Materials?**
J.D. PERKINS, T. GENNETT, J.E. LEISCH, J.J. BERRY, D.S. GINLEY, National Renewable Energy Laboratory, Golden, CO, USA
- 9.20 *FI-1:IL11* **Why Amorphous Oxide Semiconductors Have Superior Performances than Amorphous Silicon**
T. KAMIYA^{1,2}, K. NOMURA², H. HOSONO^{1,2}, ¹Tokyo Institute of Technology, Yokohama, Japan, ²JST, Yokohama, Japan
- 9.50 *FI-1:IL13* **Raman Spectroscopy: A Tool for Understanding Bulk and Surface Properties of Nanocrystalline Oxides**
T. PAGNIER, LEPMI, Saint Martin d'Hères, France
- 10.20 *FI-1:IL14* **Design of Shallow Acceptors in ZnO Through Early Transition Metals Co-doped with N Acceptors**
XIANGMEI DUAN, Dept. of Physics, Ningbo University, Ningbo, P.R. China

10.50 *Break*

Chair: J.D. PERKINS, USA

- 11.20 *FI-1:IL15* **Doping and Transport in Zinc Oxide: New Developments**
K. ELLMER, Helmholtz-Zentrum für Materialien und Energie, Dept. Solar Fuels, Berlin, Germany
- 11.50 *FI-1:IL16* **High Mobility Hydrogen-doped In₂O₃ Films for Si-based Solar Cell Application**
T. KOIDA, H. SAI, M. KONDO, Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan; K. TSUTSUMI, A. SAKAGUCHI, M. SUZUKI, J.A. Woolam Japan Corporation, Sugunami, Japan; H. FUJIWARA, Center for Innovative Photovoltaic Center, Gifu University, Gifu, Japan
- 12.20 *FI-1:L18* **DFT-based First-principle Calculation of Nb-doped anatase TiO₂ and its Interactions with Oxygen Vacancies and Interstitial Oxygen**
H. KAMISAKA, T. HITOSUGI, T. SUENAGA, T. HASEGAWA, K. YAMASHITA, The University of Tokyo, Tokyo, Japan
- 12.40 *FI-1:L17* **Electrochemically Synthesized Titania Nanostructures: Investigation of Crystal Structure and Electronic Properties**
Q.A.S. NGUYEN, T.M. DEVINE, Dept. of Materials Science and Engineering, University of California, Berkeley, CA, USA

TUESDAY JUNE 15 MORNING

Session FJ-1 - Material Growth and Processing

Room: ORSA MAGGIORE

Chair: N.H. NICKEL, Germany

- 8.30 *FJ-1:IL06* **InAs and GaN Quantum Dots: Similarities and Differences**
A. HOFFMANN, M. WINKELNKEMPER, C. KINDEL, S. WERNER, T. WARMING, G. HÖNIG, A. SCHLIEWA, D. BIMBERG, Technical University of Berlin, Institute of Solid State Physics, Berlin, Germany
- 9.00 *FJ-1:IL07* **Combining GaN and ZnO in Single Heterostructures: Exploiting Their Relative Advantages**
J. ZUNIGA PEREZ, CRHEA (CNRS), Valbonne, France
- 9.30 *FJ-1:L08* **High Ordered Thin Film of Oligothiophenes Grown by SuMBD: Optical, Electrical and Morphological Characterization**
T. TOCCOLI, M. TONEZZER, S. GOTTARDI, C. FASOLI, IFN-CNR, Povo di Trento, Italy; P. BETTOTTI, E. RIGO, L. PAVESI, Lab. Nanoscienze, Dip. di Fisica, Università di Trento, Povo di Trento, Italy; S. IANNOTTA, IMEM-CNR, Parco Area delle Scienze, Parma, Italy
- 9.50 *FJ-1:L09* **InGaN Layers for Efficient Light Emission**
M. LESZCZYNSKI, P. PERLIN, R. CZERNECKI, P. PRYSTAWKO, G. TARGOWSKI, M. SARZYNSKI, J. PLESIEWICZ, T. SUSKI, S. POROWSKI, Institute of High Pressure Physics and TopGaN, Warsaw, Poland
- 10.10 *FJ-1:L10* **Characterization of Polycrystalline SiC Layers Grown on n-type Si by LPCVD**
K. MAHMOOD, A. HASHMI, The Islamia University of Bahawalpur, Bahawalpur, Pakistan
- 10.30 *Break*

Session FJ-2 - Electro-optical Characterisation

Room: ORSA MAGGIORE

Chair: M. LESZCZYNSKI, Poland

- 11.00 *FJ-2:IL01* **Relating Microstructure to Transport in n-type Organic Semiconductors**
A. SALLEO¹, J. RIVNAY¹, M.F. TONEY², A. FACCHETTI^{3, 4}, T.J. MARKS⁴, ¹Dept. of Materials Science and Eng., Stanford University, Stanford, CA, USA; ²Stanford Synchrotron Radiation Lightsource, Menlo Park CA, USA; ³Polyera Corp., Skokie IL, USA; ⁴Dept. of Chemistry and Materials Research Center, Northwestern University, Evanston IL, USA
- 11.30 *FJ-2:IL02* **Zinc Oxide a Material for Optoelectronic Applications: Analysis of Fundamental Properties and Their Modification by Hydrogen**
N.H. NICKEL, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany
- 12.00 *FJ-2:L03* **New Phosphors for White LEDs, the Case of Phosphate Doped with Divalent Europium and Other Luminescent Ions**
B. GLORIEUX¹, A. ORLOVA², A. GARCIA¹, A. KANUNNOV², V. JUBERA¹, ¹Institut de Chimie de la Matière Condensée de Bordeaux, CNRS UPR 9048, Pessac, France; ²State University of Nizhni Novgorod, Dept. of Chemistry, Nizhni Novgorod, Russia
- 12.20 *FJ-2:L04* **Tunable Color and Luminescent Properties of Dy³⁺ and Tm³⁺ Co-activated CaZrO₃ Phosphor**
YEZHOU LI, YUHUA WANG, Dept. of Materials Science, School of Physical Science and Technology, Lanzhou University, Lanzhou, Gansu Prov., P.R. China

TUESDAY JUNE 15 MORNING

Session FM-2 - Photonic and Infrared Metamaterials

Room: ORSA MINORE

Chair: M. KAFESAKI, Greece

- 9.00 *FM-2:IL04 Photonic Metamaterials: Recent Progress*
M. WEGENER, Institut für Angewandte Physik, Institut für Nanotechnologie, DFG-Center for Functional Nanostructures, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
- 9.30 *FM-2:IL05 Manufacturing Metamaterials Using Synchrotron Lithography*
H.O. MOSER, L.K. JIAN, S.P. HEUSSLER, S.M.P. KALAISELVI, S. VIRASAWMY, S.M. MANIAM, Singapore Synchrotron Light Source/ National University of Singapore, Singapore
- 10.00 *FM-2:L06 Simple Effective Parameters Retrieval Employing Wave Propagation Phenomena*
A. ANDRYIEUSKI, R. MALUREANU, **A.V. LAVRINENKO**, Technical University of Denmark, Kgs. Lyngby, Denmark
- 10.20 *FM-2:L07 Full Scatter Characterization of Novel Photonic and Infrared Metamaterials*
T.M. FITZGERALD, M.A. MARCINIAK, Dept. of Engineering Physics, Air Force Institute of Technology, Wright-Patterson AFB, OH, USA
- 10.40 *FM-2:L08 Semiconductor-metal Nanoparticle Structure as Metamaterial with Negative Permeability at Optical Frequencies*
A.B. EVLYUKHIN, **C. REINHARDT**, A.I. KUZNETSOV, B.N. CHICHKOV, Laser Zentrum Hannover e.V., Hannover, Germany
- 11.00 *Break*

Session FM-3 - Nonlinear and Active Metamaterials

Room: ORSA MINORE

Chair: F. LEDERER, Germany

- 11.30 *FM-3:IL01 Nonlinear and Switchable Photonic Metamaterials*
N. ZHELUDEV, Optoelectronics Research Centre, University of Southampton, Southampton, UK
- 12.00 *FM-3:IL02 Nonlinear Photonics at the Nanoscale*
C. SIBILIA, Dip. di Energetica, Università di Roma La Sapienza, Rome, Italy
- 12.30 *FM-3:L03 Frequency-domain Simulations of a Negative-index Material with Embedded Gain*
Y. SIVAN^{1, 2}, S. XIAO¹, U.K. CHETTIAR^{1, 3}, A.V. KILDISHEV¹, V.M. SHALAEV¹, ¹School of Electrical and Computer Eng., Purdue University, West Lafayette, IN, USA; ²Imperial College London, Blackett Lab., London, UK; ³Electrical and Systems Eng.g, University of Pennsylvania, Philadelphia, PA, USA

TUESDAY JUNE 15 MORNING

Session FF-5 - Nuclear Fuel Materials

Room: **SMERALDO 1**

Chair: M. LE FLEM, France

- 9.30 **FF-5:IL02 From High Enriched to Low Enriched Uranium Fuel in Research Reactors**
L. SANNEN, S. VAN DEN BERGHE, A. LEENAERS, SCK.CEN, NMS(LHMA), Mol, Belgium
- 10.00 **FF-5:L03 Preparation and Characterisation of U_yAm_{1-y}O_{2-x} for Transmutation in Fast Neutrons Reactor**
D. PRIEUR, A. JANKOWIAK, C. LEORIER, N. HERLET, CEA/DEN/DTEC/SDTC/LEMA, Bagnols-sur-Ceze, France; L. DONNET, P. DEHAUDT, CEA/DEN/DTEC/SDTC/DIR; C. MAILLARD, CEA/DEN/DRCP/SE2A/LEHA; J-P. LAVAL, SPCTS Université de Limoges; P. BLANCHART, GEMH ENSCI, Université de Limoges, France
- 10.20 **FF-5:L05 Simulation and Modelling the Heterogeneous Effects of the Microstructure MOX Fuels on their Effective Properties in Nominal Pressure Water Reactor Conditions**
R. LARGENTON¹, V. BLANC², P. THEVENIN¹, D. BARON¹, ¹EDF R&D, MMC/CPCM, Site des Renardieres, Moret Sur Loing, France; ²CEA Cadarache DEN/CAD/SESC/LSC, St Paul lez Durance, France
- 10.40 *Break*
- 11.10 **FF-5:IL07 Metallic Liners for SiCf/SiC Fuel Cladding**
F. AUDUBERT, CEA, DEN, DEC, SPUA, Cadarache, St Paul lez Durance, France; J. ROGER, CEA, LCTS, France; Y. LE PETITCORPS, Université de Bordeaux, LCTS, France
- 11.40 **FF-5:IL08 Advanced Measurement Techniques for Highly Radioactive Materials**
J.R. KENNEDY, M.K. FIG, J.I. COLE, D.E. JANNEY, Idaho National Laboratory, Idaho Falls, ID, USA

**FOCUSED SESSION FF-10
Nuclear Waste Treatment and Disposal**

Session FF-10.1 - Waste Form Development

Room: **AMBRA**

Chair: K. FOX, USA (*Programme Chair*)

9.00 *Welcome*

- 9.10 *FF-10.1:IL01 Advantages Hot Isostatically Pressed Ceramic and Glass-ceramic Waste Forms Bring to the Immobilization of Challenging Intermediate- and High-level Nuclear Wastes*
E.R. VANCE, S. MORICCA, B.D. BEGG, M.W.A. STEWART, Y. ZHANG, M.L. CARTER, Australian Nuclear Science and Technology Organisation, Menai, NSW, Australia
- 9.40 *FF-10.1:IL02 Overview of Nuclear Waste Treatment Research Activities at Forschungszentrum Jülich*
D. BOSBACH, Institute for Energy Research (IEF-6), Forschungszentrum Jülich GmbH, Jülich, Germany
- 10.10 *FF-10.1:L03 "DuraLith" - A Geopolymer Radioactive Waste Form*
W.L. GONG, W. LUTZE, I.L. PEGG, The Catholic University of America, Washington, DC, USA
- 10.30 *FF-10.1:L04 Synthesis and Properties of Reaction-bonded SiC Ceramic with Embedded UO₂ - TRISO Coated Particles*
A.A. BUKAEMSKIY, J. FACHINGER, D. BOSBACH, Forschungszentrum Jülich GmbH, IEF-6, Jülich, Germany
- 10.50 *Break*

Chair: E.R. VANCE, Australia

- 11.20 *FF-10.1:IL05 Actinide-REE Host Phases with Fluorite-related Structures*
S. YUDINTSEV, IGEM RAS, Moscow, Russia
- 11.50 *FF-10.1:IL06 Zirconia-based Waste Forms from Spent Fuel Rod Treatment*
P.E. RAISON¹, C. PAVEL¹, M. STEINBRÜCK², T. WISS¹, D. BOTTOMLEY¹, R.J. KONINGS¹, V. RONDINELLA¹, ¹European Commission, Joint Research Centre Inst. for Transuranium Elements, Karlsruhe, Germany; ²Karlsruhe Inst. of Technology, GmbH, Institut für Materialforschung I, Karlsruhe, Germany
- 12.20 *FF-10.1:L08 New Actinide Waste Forms with Pyrochlore and Garnet Structures*
T.S. LIVSHITS, S.V. YUDINTSEV, IGEM RAS, Moscow, Russia; S.V. STEFANOVSKY, SIA Radon, Moscow, Russia; R.C. EWING, University of Michigan, Ann Arbor, MI, USA

TUESDAY JUNE 15 MORNING

Session FK-2 - Pnictides

Room: **SMERALDO 2**

Chair: H. HOSONO, Japan

- 9.00 *FK-2:IL05* **Fe Based Superconductors: Superconducting Properties Relevant for Applications**
M. PUTTI, I. PALLECCHI, E. BELLINGERI, M.R. CIMBERLE, M. TROPEANO, C. FERDEGHINI, P. MANFRINETTI, M. PANI, A. PALENZONA, CNR-INFM-LAMIA and Università di Genova, Genoa, Italy; C. TARANTINI, A. YAMAMOTO, J. JIANG, J. JAROSZYNSKI, F. KAMETANI, D. ABRAIMOV, A. POLYANSKII, J.D. WEISS, E.E. HELLSTROM, A. GUREVICH, D.C. LARBALESTIER, Applied Superconductivity Center, National High Magnetic Field Lab., Florida State University, FL, USA
- 9.30 *FK-2:IL06* **Iron Pnictide Superconductors with Perovskite-type Blocking Layers**
H. OGINO, K. KISHIO, J. SHIMOYAMA, Dept. of Applied Chemistry, The University of Tokyo, Tokyo, Japan
- 10.00 *FK-2:IL07* **Point Contact Andreev Reflection of the Iron Based Superconductors**
K.A. YATES, K. MORRISON, ITM USMAN, J.D. MOORE, A.D. CAPLIN, L.F. COHEN, The Blackett Laboratory, Physics Dept., Imperial College London, London, UK
- 10.30 *Break*

Session FK-3 - Properties of Semiconductors

Room: **SMERALDO 2**

Chair: H. KELLER, Switzerland

- 11.00 *FK-3:IL01* **New Trends in the Physics of Heavy Fermion Superconductors**
L. HOWALD, V. TAUFOR, E. HASSINGER, D. AOKI, T. MATSUDA, G. KNEBEL, G. LAPERTOT, J. FLOUQUET, **J.P. BRISON**, CEA-INAC-SPSMS, Grenoble, France
- 11.30 *FK-3:IL02* **Evolution of Superconductive Properties and Texture with Heat Treatment Time in Carbon-Doped In-situ Processed MgB₂ Strands**
E.W. COLLINGS, M.A. SUSNER, T.W. DANIELS, M.D. SUMPTION, The Ohio State University, Columbus, OH, USA
- 12.00 *FK-3:IL03* **Terahertz Spectroscopy of Novel Superconductors and in Strongly Correlated Materials**
S. LUPI, P. CALVANI, O. LIMAJ, D. NICOLETTI, Dept. of Physics, University of Rome La Sapienza, Rome, Italy; M. ORTOLANI, IFN-CNR, Rome, Italy; A. PERUCCHI, ELETTRA - Sincrotrone Trieste S.C.p.A., Basovizza, Trieste, Italy
- 12.30 *FK-6:IL07* **Novel Processing Techniques of Bulk HTS and the Role of Artificial Nanoparticles**
D.A. CARDWELL¹, Y. SHI¹, N. HARI BABU¹, A.D. DENNIS¹, K. IIDA², ¹Bulk Superconductor Group, Dept. of Engineering, University of Cambridge, Cambridge, UK; ²IFW-Dresden, Dresden, Germany
(rescheduled time from Session FK-6 as for Author request)

TUESDAY JUNE 15 MORNING

Session FL-1 - Advances in Biomaterials

Room: **SMERALDO 3**

Chair: K. ISHIHARA, Japan

- 8.30 *FL-1:IL07* **Nanocomposites with Bone Inductive Properties**
J.A. JANSEN, X.F. WALBOOMERS, M. VAN DER ZANDE, Dept. of Biomaterials, Radboud University Nijmegen Medical Center, Nijmegen, The Netherlands; A.G. MIKOS, B. SITHARAMAN, Dept of Bioeng., Rice University, Houston, USA; L. WILSON, Dept of Chemistry, Rice University, Houston, USA
- 9.00 *FL-1:IL08* **Nanocrystalline Carbonate Apatite Due to Chemical Conversion of Calcium Carbonates**
K. ISHIKAWA, Kyushu University, Fukuoka, Japan
- 9.30 *FL-1:IL09* **Novel, Rapidly Resorbable Bioceramic Bone Grafts Produce a Major Osteogenic Effect - The Pre-clinical Evidence**
C. KNABE, Dept. of Experimental Dentistry, Charité - University Medical Center Berlin, Germany
- 10.00 *FL-1:IL10* **A New Method to Measure Coagulability of a Patient's Blood. Use of a Moderately Thrombogenic Biomaterial and a Miniaturized Flow Reactor**
L.H. KOOLE, L.L.H. BOTH, M.L.W. KNETSCH, Dept. of Biomedical Eng./Biomaterials Science, Faculty Health, Medicine and Life Sciences Maastricht University, Maastricht, The Netherlands
- 10.30 *Break*

Room: **SMERALDO 3**

Chair: T. WEBSTER, USA

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| <p>11.00 Presentation of the Early Career Scientist Award to
Barbara RUOZI, University of Modena, Italy
<i>Award Talk by Barbara RUOZI</i>
Nanotechnology for Drug Delivery and Drug Targeting</p> |
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Session FL-3 - Medical Diagnosis Applications

- 11.30 *FL-3:IL01* **DNA Diagnostics Using New Cationic Polymers**
A. MARUYAMA, Institute for Materials Chemistry and Eng., Kyushu University, Fukuoka, Japan
- 12.00 *FL-3:IL02* **Sensor Technologies to Probe Cell-material Interactions**
S. MICHAELIS, J. WEGENER, Institute of Analytical Chemistry, Chemo- & Biosensors, University of Regensburg, Regensburg, Germany
- 12.30 *FL-3:IL03* **Novel Biomaterials and Nano-biotechnology Approaches in Tumor Diagnosis**
A.K. DINDA, Dept. of Pathology, All India Institute of Medical Sciences, New Delhi, India

TUESDAY JUNE 15 AFTERNOON

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

Room: ALBA 2

Chair: M. ZOPPI, Italy

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

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

16.30 *Break*

Chair: G. SCHILLER, Germany

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

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

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

TUESDAY JUNE 15 AFTERNOON

Sub-session FB-2.3 - Complex Hydrides

Room: AUDITORIUM

Chair: I. YAROVSKY, Australia

- 15.00 *FB-2.3:IL01* **Achievements and Perspectives of the US National Program on Hydrogen Storage**
N. STETSON, C. READ, G. ORDAZ, M. GARDNER, S. DILLICH, Office of Energy Efficiency and Renewable Energy, EE-2H, U.S. Department of Energy (U.S. DOE), Washington, DC, USA
- 15.30 *FB-2.3:IL02* **Hydrogen Sorption Characteristics of Group I & II Borohydrides and Hydride Composites**
Y.-S. LEE, J.-H. SHIM, Y.W. CHO, Korea Institute of Science and Technology, Cheongryang, Seoul, Korea
- 16.00 *FB-2.3:IL03* **LiBh₄ - A Versatile Hydrogen Storage Compound**
W.I.F. DAVID, ISIS Facility, Rutherford Appleton Laboratory, Chilton, UK
- 16.30 *FB-2.3:IL04* **Microwave Absorption and Lithium Super-Ionic Conduction in Lithium Borohydride LiBH₄**
M. MATSUO, S. ORIMO, Institute for Materials Research, Tohoku University, Sendai, Japan
- 17.00 *Break*

Sub-session FB-2.8 - Storage Testing, Safety and Economic Issues

Room: AUDITORIUM

Chair: E. AKIBA, Japan

- 17.30 *FB-2.8:IL01* **Environmental Reactivity of Solid State Hydride Materials: Modeling and Testing for Air and Water Exposure**
D.L. ANTON, D.A. TAMBURELLO, J.R. GRAY, K.S. BRINKMAN, C.W. JAMES, J.A. CORTES, Savannah River National Laboratory, Aiken, SC, USA
- 18.00 *FB-2.8:IL02* **A New Technology for Hydrogen Storage: Theory and Applications for the Transportation and Gas Industries**
D. ELIEZER, FASM C.En Ltd, Zurich, Switzerland
- 18.30 *FB-2.8:IL03* **Hydrogen Storage in Complex Hydride Tanks: Upscaling and Testing**
J.M. BELLOSTA VON COLBE, G. LOZANO, J. JEPSEN, M. DORNHEIM, GKSS Research Center Geesthacht GmbH, Geesthacht, Germany

TUESDAY JUNE 15 AFTERNOON

Session FC-4 - Molten Carbonate and Alkaline Fuel Cells

Room: **VENERE**

Chair: M. SCAGLIOTTI, Italy

- 15.00 *FC-4:IL01* **Status and Challenges of Molten Carbonate Fuel Cells**
S.J. McPHAIL, ENEA, Rome, Italy
- 15.30 *FC-4:IL02* **Critical Issues on MCFC Materials**
M. CASSIR, Lab. d'Electrochimie, Chimie des Interfaces et Modélisation pour l'Energie, LECIME, UMR 7575 CNRS, Chimie ParisTech, Paris, France
- 16.00 *FC-4:IL03* **Solutions for Material Corrosion Problems in MCFC**
S. FRANGINI, A. MORENO, ENEA CRE Casaccia, Dept. TER, S. Maria di Galeria, Rome, Italy
- 16.30 *FC-4:L04* **Unraveling Oxygen Reduction Reaction Mechanisms on Carbon Supported Fe-Phthalocyanine and Co-Phthalocyanine Catalysts in Alkaline Media**
RONGRONG CHEN¹, HAIXIA LI¹, ANDREW HSU¹, DERYN CHU², GUOFENG WANG¹, ¹Richard G. Lugar Center for Renewable Energy, Indiana University Purdue University-Indianapolis, IN, USA; ²U.S. Army Research Laboratory, Adelphi, MD, USA
- 16.50 *Break*

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

Room: **VENERE**

Chair: B. RIETVELD, The Netherlands

- 17.20 *FC-1:L17* **(Y_{0.08}Sr_{0.92})(Ti_{1-x}Fe_x)O_{3-δ} Perovskite for Solid Oxide Fuel Cell Anode**
JONG SEOL YOON, MI YOUNG YOON, HAE JIN HWANG, Division of Materials Science and Engineering, Inha University, Korea; CHAN KWAK, HEE JUNG PARK, SANG MOK LEE, Samsung Electronics Co., LTD, Korea
- 17.40 *FC-1:L18* **The Study of Oxidation Resistance of Fe-Cr-Mn-X Alloys for Interconnector of Solid Oxide Electrolyte Fuel Cell (SOFC)**
W.S. WANG, S.S. LIAN, C.CHEN, Dept. of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan; K.C. TSAI, W.J. SHONG, R.Y LEE, Institute of Nuclear Energy Research, the Atomic Energy Council, Taiwan
- 18.00 *FC-1:L20* **Structure and Ionic Conductivity of Apatite Type-lanthanum Silicates**
S. GUILLOT, S. BEAUDET-SAVIGNAT, S. LAMBERT, CEA/Le Ripault/SRCC/LCCA, Monts, France; P. ROUSSEL, R.-N. VANNIER, UCCS, UMR CNRS 8181, Villeneuve d'Ascq, France

TUESDAY JUNE 15 AFTERNOON

Session FD-1 - Chemical Storage

Room: GIOVE

Chair: R.R. BAUMANN, Germany

- 15.00 *FD-1:IL16* **Modified Graphite Anodes for Lithium-ion Batteries Optimized for Low Temperature**
R. MARASSI, F. NOBILI, S. DSOKE, M. MANCINI, M. MARINARO, S. GIULI, R. TOSSICI, Dept. of Chemistry, University of Camerino, Camerino (MC), Italy
- 15.30 *FD-1:IL17* **Gel-polymer Composite Electrolyte for Perspective Li-metal Secondary Battery Systems**
TETSUYA OSAKA, HIROKI NARA, Waseda University, Tokyo, Japan
- 16.00 *FD-1:L18* **Ionic Liquid Electrolyte Mixtures for Low Temperature Applications**
G.B. APPETECCHI, M. MONTANINO, M. CAREWSKA, F. ALESSANDRINI, S. PASSERINI*, ENEA, IDROCOMB, Rome, Italy; *present address: Westfälische Wilhelm Universität, Institut für Physikalische Chemie, Münster, Germany
- 16.20 *FD-1:L19* **New Synthesis Method for Conversion Materials with High Cyclic Stability**
M. FICHTNER, W. LOHSTROH, C. WALL, R. PRAKASH, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
- 16.40 *Break*

Session FD-2 - Capacitive Storage

Room: GIOVE

Chair: F. ROOZEBOOM, The Netherlands

- 17.10 *FD-2:IL13* **Nanohybrid Capacitor: A New Hybrid Capacitor System, Triply Enhanced Energy Density by Use of nc-Li4Ti5O12/CNF**
K. NAOI, Institute of Symbiotic Science & Technology, Tokyo University of Agriculture & Technology, Tokyo, Japan
(rescheduled time as for Author request)
- 17.40 *FD-2:IL02* **Graphene Supercapacitors**
W. SUGIMOTO, J. SATO, K. FUKUDA, Y. TAKASU, Shinshu University, Ueda, Nagano, Japan
- 18.10 *FD-2:L03* **Self-assembled Synthesis of Graphene Nanosheets for Supercapacitors**
YING-FENG LEE, KUO-HSIN CHANG, CHI-CHANG HU, National Tsing-Hua University, Hsin-Chu, Taiwan
- 18.30 *FD-2:L04* **Flexible Supercapacitors Consisting of Polyaniline and RuO₂/Graphene Nanocomposite**
KUO-HSIN CHANG, Y.F. LEE, C.C. HU, P.J. HUNG, National Tsing Hua University, Hsin-Chu, Taiwan

TUESDAY JUNE 15 AFTERNOON

Session FE-1 - Theoretical Concepts and Basic Approaches

Room: URANO

Chair: J. SNYDER, USA

- 15.00 *FE-1:IL05* **Nanostructured Thermoelectric Materials and Their Potential Applications**
GANG CHEN, M.S. DRESSELHAUS, Massachusetts Institute of Technology, Cambridge, MA, USA; Z.F. REN, Boston College, Chestnut Hill, MA, USA
- 15.30 *FE-1:IL06* **Thermoelectric Energy Conversion Near Carnot Efficiency**
H. LINKE, The Nanometer Structure Consortium and Division of Solid State Physics, Lund University, Lund, Sweden
- 16.00 *FE-1:IL07* **Theory of Nanostructured Thermoelectrics**
G.D. MAHAN, Penn State University, University Park, PA, USA
- 16.30 *FE-1:IL08* **Large Thermopower Driven by "Pudding-mold"-type Bands**
K. KUROKI, Dept. of Applied Physics and Chemistry, The University of Electro-Communications, Tokyo, Japan
- 17.00 *Break*

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

Room: URANO

Chair: A. MAIGNAN, France

- 17.30 *FE-2:IL09* **Thermoelectric Properties of Cobalt Oxides Improved by Spin State Control**
I. TERASAKI, Dept. of Applied Physics, Waseda University, Tokyo, Japan
- 18.00 *FE-2:IL10* **Layered Thermoelectric Oxides**
S. HEBERT, D. PELLOQUIN, O. PÉREZ, W. KOBAYASHI, A. MAIGNAN, Laboratoire CRISMAT, Caen, France
- 18.30 *FE-2:L11* **Epitaxial Growth of Nanostructured Bismuth Films on Si Through a Chemical Solution Route**
ZHENGLIANG SUN, SHENGCONG LIUFU, QIN YAO, LIDONG CHEN, CAS Key Lab. of Materials for Energy Conversion, Shanghai Institute of Ceramics, CAS, Shanghai, P.R. China
- 18.50 *FE-2:L12* **Electrical and Thermal Transport Properties of ZnO Thermo-electric Oxide Doped with Al and Ga**
M. OHTAKI, K. YAMAMOTO, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Fukuoka, Japan

TUESDAY JUNE 15 AFTERNOON

Session FH-2 - CPV Cell Components, Module Assembly and Testing

Room: LE PLEIADI

Chair: C. ALGORA, Spain

- 15.00 *FH-2:IL01* **CPV Modules Based on Lens Panels**
V.D. RUMYANTSEV, Ioffe Physical-Technical Institute, St. Petersburg, Russia
- 15.30 *FH-2:IL02* **Characterization of III-V Multi-junction Concentrator Cells and Systems**
G. SIEFER, G. PEHARZ F. DIMROTH A.W. BETT, Fraunhofer Institute for Solar Energy Systems, Freiburg, Germany
- 16.00 *FH-2:IL03* **Modelling, Characterising and Optimising CPV Modules**
D. BUIE, R. HOFFMAN, Emcore Corporation, Albuquerque, NM, USA
- 16.30 *FH-4:IL07* **Thermal Energy Storage for Process Heat and Power Generation - Impact of Materials to Realise Efficient and Economic Storage Solutions**
R. TAMME, T. BAUER, C. MÜHLHAUSEN, F. SCHAUBE, D. LAING, DLR, German Aerospace Center, Institute of Technical Thermodynamics, Stuttgart, Germany
(rescheduled time from Session FH-4 as for Author request)
- 17.00 *Break*

Session FG-3 - Emerging and New Generation Solar Cells

Room: LE PLEIADI

Chair: P.C. DASTOOR, Australia

- 17.30 *FG-3:L16* **Optimizing Quantum Dot Solar Concentrators with Thin Film Solar Cells**
W.G.J.H.M. VAN SARK, C. DE MELLO DONEGÁ, R.E.I. SCHROPP, Faculty of Science, Utrecht University, Utrecht, The Netherlands
- 17.50 *FG-3:L17* **Cooperative Near-infrared Quantum Cutting in YVO4: Yb³⁺, Tm³⁺ Nanophosphors**
HUIJUAN ZHANG, YUHUA WANG, Dept. of Materials Science, School of Physical Science and Technology, Lanzhou University, Lanzhou, Gansu prov., China
- 18.10 *FG-3:L18* **Thin-Film Si Solar Cells Using Back Reflector with Embedded Metal Nanoparticles**
R. LIANG, **R. SANTBERGEN**, M. ZEMAN, Delft University of Technology, Delft, The Netherlands
- 18.30 *FG-3:L19* **GaAs-based Nanowire Arrays Grown by MOVPE on (111)Si Substrates for PV Applications**
P. PRETE, IMM-CNR, Lecce, Italy; I. MICCOLI, F. MARZO, N. LOVERGINE, Dept. of Innovation Engineering, University of Salento, Lecce, Italy
- 18.50 *FG-3:L21* **Metamorphic GaAsP/Si Materials for Spectrum-Optimized Si-based Multijunction Solar Cells**
S.A. RINGEL, T.J. GRASSMAN, The Ohio State University, Dept. of Electrical and Computer Engineering, Columbus, OH, USA

TUESDAY JUNE 15 AFTERNOON

Session FI-2 - Materials Design and Device Development

Room: SIRIO

Chair: D.A. KESZLER, USA

- 15.00 *FI-2:IL01* **Transparent Conductive Amorphous Oxides - Past, Present and Future**
E. FORTUNATO, G. GONÇALVES, P. BARQUINHA, L. PEREIRA, R. MARTINS, CENIMAT/I3N, FCT-UNL, Caparica, Portugal
- 15.30 *FI-2:IL02* **Novel Spintronics Application of ZnO based DMS**
N. FUJIMURA, K. MASUKO, A. ASHIDA, T. YOSHIMURA, Graduate School of Eng., Osaka Prefecture University, Sakai, Osaka, Japan
- 16.00 *FI-2:L03* **Non-oxide Wide-bandgap p-type Semiconductors BaCuChF (Ch = S, Se, Te)**
A. ZAKUTAYEV, R. KYKYNESHI, G. SCHNEIDER, J. TATE, Dept. of Physics, Oregon State University, OR, USA; H.A.S. PLATT, D.A. KESZLER, Dept. of Chemistry, Oregon State University, OR, USA; A. KLEIN, Surface Science Division, Institute of Materials Science, Darmstadt University of Technology, Darmstadt, Germany
- 16.20 *FI-2:L04* **Unusual Dielectric and Conductive Behavior of ZnO Bicrystalline (000-1) Interfaces**
JONG-SOOK LEE, YONG KIM, EUI-CHOL SHIN, Chonnam National University, Gwangju, Korea; J. MAIER, Max Planck Institute for Solid State Research, Stuttgart, Germany
- 16.40 *FI-2:L05* **Mechanism of Electrical Properties Degradation of ZnO:Al Films During Growth at Elevated Temperatures**
M. VINNICHENKO, R. GAGO*, S. CORNELIUS, A. ROGOZIN, N. SHEVCHENKO, A. KOLITSCH, W. MÖLLER, Inst. of Ion-Beam Physics and Materials Research, Forschungszentrum Dresden-Rossendorf, Dresden, Germany; *Inst. de Ciencia de Materiales de Madrid, Spain
- 17.00 *Break*

Chair: E. FORTUNATO, Portugal

- 17.30 *FI-2:IL06* **Aqueous Processing for Oxide Electronics**
A. TELECKY, WEI WANG, KAI JIANG, S.T. MEYERS, **D.A. KESZLER**, Dept. of Chemistry, Oregon State University, Corvallis, OR, USA
- 18.00 *FI-2:IL07* **TCO Nanoparticles: Properties and Electronic Devices**
R. SCHMECHEL, Faculty of Engineering, University Duisburg-Essen and CeNIDE, Duisburg, Germany
- 18.30 *FI-2:L08* **Change of Electrical Properties of a-IGZO TFT Depending on Processing Parameters**
K.C. JO^{1,2}, E.J. CHONG¹, J.S. LEE¹, S.Y. LEE¹, ¹Center for Energy Materials Research, Korea Inst. of Science and Tech., Seoul, Korea; ²Dept. of Electronics and Electrical Eng., Korea University, Seoul, Korea
- 18.50 *FI-2:L09* **Simultaneous Monitoring of Optical and Conductance Changes during the Redox Transformation of Transparent Conducting Layers**
C. VISY, P. S. TÓTH, E. PEINTLER-KRIVÁN, University of Szeged, Dept. of Physical Chemistry & Material Science, Szeged, Hungary
- 19.10 *FI-2:L10* **Inkjet Printing of Transparent Electronics Based on Low Temperature Process of Ternary Metal Oxides**
A. OLZIERSKY¹, A. VILA¹, J.R. MORANTE^{1,2}, ¹M-2E/XaRMAE/IN2UB, Dept.

Session FJ-1 - Material Growth and Processing

Room: ORSA MAGGIORE

Chair: B.G. SVENSSON, Norway

- 15.00 *FJ-1:IL11* **Heteroepitaxial Growth of m-plane InN on LiAlO₂ Substrates and Its Strong Anisotropic Optical Behaviors**
CHING-LIEN HSIAO¹, JR-TAI CHEN¹, HSU-CHENG HSU¹, KUEI-HSIEN CHEN^{1,2}, **LI-CHYONG CHEN¹**, ¹Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; ²Institution of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan
- 15.30 *FJ-1:IL12* **(Ga,Al,In)N Growth on Silicon**
A. KROST, Otto-von-Guericke-Universität Magdeburg, FNW-IEP, Magdeburg, Germany
- 16.00 *FJ-1:IL13* **Recent Advances in the MOVPE Epitaxy of Indium Nitride**
O. BRIOT, S. RUFFENACH, **M. MORET**, B. GIL GES, CNRS UMR5650 CC074, Université Montpellier 2, Montpellier, France
- 16.30 *FJ-1:L14* **AlN Technology for UV Light Emitting Devices**
Z. SITAR¹, P. LU², B. MOODY², R. SCHLESSER², R. COLLAZO¹, R. DALMAU², J. XIE², ¹Dept. of Materials Science and Engineering, North Carolina State University, Raleigh, NC, USA; ²HexaTech, Inc., Morrisville, NC, USA
- 16.50 *FJ-1:L15* **Growth and Characterization of Deep UV-range ZnMgSrO Thin Films Lattice-matched to ZnO Substrate**
NAE-SANG YOON, JANG-HO PARK, IL-SOO KIM, **BYUNG-TEAK LEE**, Photonic and Electronic Thin Film Lab., Dept. of Materials Science and Eng., Chonnam National University, Gwangju, Republic of Korea

TUESDAY JUNE 15 AFTERNOON

Room: ORSA MINORE

Chair: A. ZHUKOV, Spain

Session FM-1 - Microwave and THz Metamaterials

- 15.30 *FM-1:IL04 Radar Absorbing Material Based on Metamaterials*
A.N. LAGARKOV, V.N. KISEL, V.N. SEMENENKO, ITAE RAS, Moscow, Russia
- 16.00 *FM-1:IL05 Microwave Metamaterials Containing Magnetically Soft Microwires*
L.V. PANINA, School of Comp., Comm. and Electr., Univ. of Plymouth, Plymouth, UK; M. IPATOV, V. ZHUKOVA, **A. ZHUKOV**, Dpto. de Física de Materiales, Fac. Químicas, UPV/EHU San Sebastián, Spain

Session FM-4 - Antenna and Waveguide Applications

- 16.20 *FM-4:IL01 Fundamentals and Applications of Transmission-line Metamaterials*
G.V. ELEFThERIADES, **L. MARKLEY**, University of Toronto, Dept. of Electrical and Computer Engineering, Toronto, ON, Canada
- 16.50 *FM-4:IL02 On the Way to Improved Plasmonic Structures*
A. BOLTASSEVA^{1,2}, R.B. NIELSEN¹, G. NAIK², P. WEST², N. EMANI², V. SHALAEV², ¹DTU Fotonik, Technical University of Denmark, Kgs Lyngby, Denmark; ²Birck Nanotechnology Center, Purdue University, West Lafayette, IN, USA

TUESDAY JUNE 15 AFTERNOON

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

Room: **SMERALDO 1**

Chair: M. CHATELIER, France

- 15.00 *FF-3:IL02* **Radiation Effects on First Wall Components for Fusion Power Reactors**
N. BALUC, EPFL, Centre de Recherche en Physique des Plasmas, Association Euratom-Confédération Suisse, Switzerland
- 15.30 *FF-3:IL05* **Effect of Plasma-facing Materials on the Tritium Inventory in Fusion Devices**
J. ROTH, K. SCHMID, CH. LINSMEIER, Max-Planck-Institut für Plasmaphysik, EURATOM Association, Garching b. München, Germany
- 16.00 *FF-3:IL06* **Materials Challenges for Plasma-facing Materials in Future Fusion Reactors**
H. BOLT, J. LINKE, Forschungszentrum Juelich, Juelich, Germany; Ch. LINSMEIER, Max Planck Institute for Plasma Physics, Garching, Germany
- 16.30 *FF-3:IL07* **Fabrication and Characterization of Magnetron Sputtered Tungsten/EUROFER 97 Coatings**
T. WEBER¹, M. STÜBER², S. ULRICH², J. AKTAA¹, ¹Karlsruhe Institute of Technology, Inst. for Materials Research II, Eggenstein-Leopoldshafen, Germany; ²Karlsruhe Institute of Technology, Inst. for Materials Research I, Eggenstein-Leopoldshafen, Germany
- 16.50 *Break*

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

Room: **SMERALDO 1**

Chair: N. BALUC, Switzerland

- 17.20 *FF-2:IL04* **Metallic and Ceramic Low Activation Structural Materials For In-vessel Components of Future Fusion Reactors**
M. RUBEL, Alfvén Laboratory, Royal Institute of Technology, Association Euratom - VR, Stockholm, Sweden; J. LINKE, Institute of Energy Research, Forschungszentrum Jülich, Association Euratom, Jülich, Germany; M. RIETH, Forschungszentrum Karlsruhe, Association Euratom - FZK, Karlsruhe, Germany
- 17.50 *FF-2:IL05* **Ceramic Composites for Fission and Fusion Applications**
Y. KATOH, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA
- 18.20 *FF-2:IL07* **SiCf/SiC Composites Irradiation Behaviour in Fusion Reactor Environment Conditions**
JI-JUNG KAI, Center for Energy and Environmental Research, Dept. of Eng. and System Science, National Tsing Hua University, Hsinchu, Taiwan, R.O.C.

TUESDAY JUNE 15 AFTERNOON

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

Room: **AMBRA**

Chair: F. LEMONT, France

- 15.00 *FF-10.2:IL01* **Advanced ORIENT Cycle for Turning Radioactive Waste into Resource**
MASAKI OZAWA, Japan Atomic Energy Agency, Tokyo Institute of Technology, Tokai-mura, Ibaraki-ken, Japan
- 15.30 *FF-10.2:IL02* **The Role of Noble Metals in HLLW Vitrification**
G. ROTH, Karlsruhe Institute of Technology, Institut für Nukleare Entsorgung, Eggenstein-Leopoldshafen, Germany
- 16.00 *FF-10.2:IL03* **On Nanostructured Hydrogen Catalysts, Fission-product Alloy Particles Extracted from Spent Nuclear Fuel**
DAQING CUI, Studsvik AB, Nyköping, Sweden, and Stockholm University, Dept. of Material and Environmental Science, Stockholm, Sweden
- 16.30 *FF-10.2:L04* **Co-conversion of Actinides into a Uranium Matrix**
H. DANIELS, S. NEUMEIER, A.A. BUKAEMSKIY, G. MODOLO, D. BOSBACH, Forschungszentrum Jülich GmbH, IEF-6, Jülich, Germany

TUESDAY JUNE 15 AFTERNOON

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

Room: **AMBRA**

Chair: H.-J. GRAFE, Germany

- 18.25 *FK-1:L04* **Synthesis, Structural and Physical Properties of Substituted Eu₂Ru₂-xIrxO₇**
T.E. SUTTO, T. WONG, J. TAFT, T. DUNCAN, M. OSOFSKY, D. GUBSER, Naval Research Laboratory, Material Science and Eng. Division, Washington, DC, USA
- 18.45 *FK-1:L05* **Homogeneity and Connectivity of Doped MgB₂ Bulks and Strands as Probed by Heat Capacity, SEM, and Current Transport**
M.D. SUMPTION, M.A. SUSNER, Y. YANG, E.W. COLLINGS, LASM, Dept. of Materials Science and Engineering, The Ohio State University, Columbus, OH, USA
- 19.05 *FK-1:L06* **YBCO and YbBCO Thin Films and Multilayers Grown by MOCVD**
A.V. MARKELOV, A.A. ZAKHAROV, S.V. SAMOYLENKOV, A.R. KAUL, Lomonosov Moscow State University, Dept. of Materials Science, Moscow, Russia

TUESDAY JUNE 15 AFTERNOON

Session FK-3 - Properties of Superconductors

Room: **SMERALDO 2**

Chair: E.W. COLLINGS, USA

- 15.00 *FK-3:IL05* **FFLO State in Heavy Fermion Superconductors**
Y. MATSUDA, Dept. of Physics, Kyoto University, Kyoto, Japan
- 15.30 *FK-3:IL06* **Optical Spectroscopy Study on Fe-pnictides**
NAN LIN WANG, Institute of Physics, Chinese Academy of Sciences, Beijing, China
- 16.00 *FK-3:IL07* **Neutron Scattering of Cuprate Superconductor**
K. YAMADA, M. FUJITA, H. HIRAKA, Tohoku University, Sendai, Miyagi, Japan; M. MATSUDA, S. WAKIMOTO, Japan Atomic Energy Agency, Japan
- 16.30 *FK-3:L08* **High-pressure Oxygenation of MT-YBCO**
T.A. PRIKHNA¹, X. CHAUD², W. GAWALEK³, A.P. SHAPOVALOV¹, A. JOULAIN⁴, J. RABIER⁴, V.E. MOSHCHIL¹, Ya.M. SAVCHUK¹, N.V. SERGIENKO¹, S.N. DUB¹, V.S. MELNIKOVA¹, T. HABISREUTHER³, D. LITZKENDORF³, J. BIERLICH³, ¹Inst. for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine; ²CNRS/CRETA, Grenoble, France; ³Inst. für Photonische Technologien, Jena, Germany; ⁴Université de Poitiers, CNRS/Lab. de Metallurgie Physique, Chasseneuil Futuroscope, France
- 16.50 *Break*

Chair: Y. MATSUDA, Japan

- 17.20 *FK-3:IL10* **BCS Superconducting Gap in Electron-doped Cuprates**
I. DIAMANT, **Y. DAGAN**, School of Physics and Astronomy, Tel Aviv University, Tel Aviv, Israel
- 17.50 *FK-3:IL11* **Isotope Effects and Multi-band Superconductivity in Layered High-temperature Superconductors**
H. KELLER, Physik-Institut der Universität Zürich, Zürich, Switzerland

Session FK-2 - Pnictides

- 18.20 *FK-2:L09* **On the Microscopic Magnetic Properties of Superconducting SmFeAsO_{0.8}F_{0.2}**
G. PRANDO, Dip. di Fisica "E. Amaldi", Università di Roma Tre, Roma, Italy and CNISM, u.d.r. di Pavia and Dip. di Fisica "A. Volta", Università di Pavia, Pavia, Italy; P. CARRETTA, A. LASCIALFARI, A. RIGAMONTI, S. SANNA, Dip. di Fisica "A. Volta", Università di Pavia, Pavia, Italy; L. ROMANO', Dip. di Fisica and Unità CNISM, Università di Parma, Parma, Italy; A. PALENZONA, M. PUTTI, M. TROPEANO, Dip. di Fisica, Università di Genova, Genova, Italy and CNR/INFM-LAMIA, Genova, Italy
- 18.40 *FK-2:L10* **Universal Normal State Susceptibility in Iron Pnictides**
R. KLINGELER, N. LEPS, U. STOCKERT, C. HESS, V. KATAEV, H.-J. GRAFE, F. HAMMERATH, G. LANG, G. BEHR, L. HARNAGEA, S. SINGH, B. BÜCHNER, Inst. for Solid State Research, IFW Dresden, Dresden, Germany

TUESDAY JUNE 15 AFTERNOON

Session FL-1 - Advances in Biomaterials

Room: **SMERALDO 3**

Chair: D. HOFMANN, Germany

- 15.30 **FL-1:L14 Hydroxyapatite and Chlorapatite Thin Coatings Obtained by a Novel Plasma Mini-torch Process**
I. DEMNATI, D. GROSSIN, C. DROUET, C. COMBES, C. REY, Université de Toulouse- CIRIMAT CNRS-INPT-UPS ENSIACET, Toulouse, France; M. PARCO, I. FAGOAGA, G. BARYKIN, I. BRACERAS, INASMET-Tecnalia, Donostia-San Sebastian, Spain; S. GONCALVES, TEKNIMED S.A, L'Union, France
- 15.50 **FL-1:L15 Molecularly Imprinted Polymer Layers for the Selective Uptake and Release of Glutamate for Application in a Neurochemical Switch**
E. VON HAUFF, K. FUCHS, J. PARISI, Inst. for Physics, Energy and Semiconductor Research Lab., Carl von Ossietzky University, Oldenburg, Germany; **N. PAUL**, M. LUX-STEINER, Inst. for Heterogeneous Material Systems, Helmholtz Centre Berlin for Materials und Energy, Berlin, Germany; U. KRAUSHAAR, E. GUENTHER, Cell Biologie, AG Elektrophysiologie, Natural and Medical Sciences Inst., University of Tübingen, Reutlingen, Germany
- 16.10 **FL-1:L18 Study of BSA Adsorption on Silicon Plasma Deposit with Silver Nanoparticles by QCM and XPS**
CHUN WANG¹, S. ZANNA¹, I. FRATEUR¹, B. DESPAX², P. RAYNAUD², P. MARCUS¹, ¹Lab. de Physico-Chimie des Surfaces, CNRS-ENSCP (UMR 7045), Ecole Nat. Sup. de Chimie de Paris, Chimie-ParisTech, Paris, France; ²Lab. Plasma et Conversion d'Energie, UMR CNRS 5003 Univ. Paul Sabatier, Toulouse, France
- 16.30 **FL-1:L20 Hydrothermal Synthesis of Hydroxyapatite Particles from Different Raw Materials and their Characterization**
M. KAMITAKAHARA, Y. ENARI, N. ITO, N. WATANABE, K. IOKU, Graduate School of Environmental Studies, Tohoku University, Sendai, Miyagi, Japan
- 16.50 *Break*

Chair: K. ISHIKAWA, Japan

- 17.10 **FL-1:L21 Development of Craniofacial Implants Produced by Metal Injection Molding of Titanium Alloy Using Novel Binder System Based on Palm Oil**
R. IBRAHIM, M. AZMIRRUDDIN, M. JABIR, M. RIDHUAN, M. MUHAMAD, M. RAFIQ, N.A. KASIM, S. MUHAMAD, Kulim, Malaysia
- 17.30 **FL-1:L23 Development of Bone-integrating Hybrid Materials Useful for Hard Tissue Repair**
TOSHIKI MIYAZAKI, Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology, Kitakyushu, Japan
- 17.50 **FL-1:L24 Mineralization of Eroded Dental Enamel Seeded with Fluoride and a Tricalcium Phosphate Ternary Biomaterial**
R.L. KARLINSEY, A.C. MACKEY, E.R. WALKER, T.J. WALKER, Indiana Nanotech, Indianapolis, IN, USA; C.X. FOWLER, GlaxoSmithKline, USA

TUESDAY JUNE 15 AFTERNOON

Session FL-6 - Progress in Implant Prostheses

Room: **TURCHESE**

Chair: C.T. LAURENCIN, USA

- 15.00 *FL-6:L05* **Nano-scale Evaluation of Surface Morphology Before and After Environmental Exposure In Vitro of an Advanced Alumina/Zirconia Composite for Arthroplastic Applications**
KENGO YAMAMOTO, Dept. of Orthopedic Surgery, Tokyo Medical University, Tokyo, Japan; **G. PEZZOTTI**, Ceramic Physics Lab. & Research Institute for Nanoscience, Kyoto Inst. of Technology, Kyoto, Japan
- 15.20 *FL-6:L06* **Carbon Nanotubes In Vitro and In Vivo Biological Effects**
S. BELLUCCI, INFN-Laboratori Nazionali di Frascati, Frascati, Italy
- 15.40 *FL-6:L07* **Closure of Oroantral Communications Using Biodegradable Polyurethane Foam**
S.H. VISSCHER, **B. VAN MINNEN**, **R.R.M. BOS**, Dept. of Oral and Maxillofacial Surgery, University Medical Centre Groningen, Groningen, The Netherlands
- 16.00 *FL-6:L08* **Role of Grain Size Fluctuations on the Environmental Resistance of Alumina-Zirconia Composite in Comparison with Commercially Available Monolithic Zirconia Femoral Heads**
N. SUGANO, Dept. of Orthopaedic Medical Eng., Osaka Univ. Grad. School of Medicine, Osaka, Japan; **G. PEZZOTTI**, Ceramic Physics Lab. & Research Institute for Nano-science, Kyoto Institute of Technology, Kyoto, Japan, The Center for Advanced Medical Engineering and Informatics, Osaka University, Osaka, Japan
- 16.20 *FL-6:L09* **In Vivo Hemostatic Effect of Polyurethane Foam Compared to Collagen and Gelatin**
F.I. BROEKEMA¹, **W. VAN OEVEREN**², **R.R.M. BOS**¹, ¹Dept. of Oral and Maxillofacial Surgery, University Medical Center Groningen, Groningen, The Netherlands; ²Dept. of Biomedical Engineering, University Medical Center Groningen, Groningen, The Netherlands
- 16.40 *FL-6:L10* **Stoichiometry and Surface Stress Analyses in Advanced Alumina/Zirconia Composites for Hip Arthroplasty Applications**
A.A. PORPORATI^{1, 2}, **M.C. MUNISSO**^{1, 2}, **K. LESSNAU**³, **G. PEZZOTTI**^{1, 2}, ¹Ceramic Physics Lab., Kyoto Institute of Technology, Kyoto, Japan; ²Research Inst. for Nanoscience, Kyoto Institute of Technology, Kyoto, Japan; ³CeramTec AG, Plochingen, Germany
- 17.00 *Break*

Session FL-4 - Regenerative Medicine and Tissue Engineering

Room: **TURCHESE**

Chair: A. KISHIDA, Japan

- 17.30 *FL-4:L18* **A Hydroxyapatite-collagen Composite Useful to Make Bioresorbable Scaffolds for Bone Reconstruction**
G.D. GUERRA, C. CRISTALLINI, CNR Inst. for Composite and Biomedical Materials, Research Unit of Pisa, Pisa, Italy; N. BARBANI, E. ROSELLINI, Dept. of Chemical Engineering, Industrial Chemistry and Materials Science, University of Pisa, Pisa, Italy
- 17.50 *FL-4:L19* **Growth Factor-immobilized PCL Porous Beads as a Bioactive Urethral Bulking Agent**
S.H. OH, I.G. KIM, J.H. LEE, Dept. of Advanced Materials, Hannan University, Daejeon, South Korea; J.Y. LEE, J.Y. LEE, Dept. of Urology, Catholic University, Seoul St. Mary's Hospital, Seoul, South Korea
- 18.10 *FL-4:L20* **Catastrophic Instabilities in the Fracture of Nanotube Bundles**
N. PUGNO, T. ABDALRAHMAN, Dept. of Structural and Geotechnical Engineering, Lab. of Bio-Inspired Nanomechanics "Giuseppe Maria Pugno", Politecnico di Torino, Torino, Italy

WEDNESDAY JUNE 16 MORNING

Sub-session FA-1.2 - Membranes for O₂ Separation and Adsorbents for CO₂ Capture

Room: ALBA 2

Chair: P. STEINMETZ, France

9.00 *FA-1.2:IL07* **High-temperature CO₂ Sorbents for Pre-combustion CO₂ Capture**

R.W. VAN DEN BRINK, E.R. VAN SELOW, P.D. COBDEN, S. WALSPURGER, W.G. HAIJE, Energy Research Centre of the Netherlands (ECN), Petten, The Netherlands

9.30 *FA-1.2:IL08* **Designing New Microporous Framework Materials for CO₂ Capture**

R.G. BELL, A. TORRISI, C. MELLOTT-DRAZNIKES, Dept. of Chemistry, University College London, London, UK

10.00 *Break*

Sub-session FA-1.3 - Thermal and Protective Coatings

Room: ALBA 2

Chair: A.K. NATESAN, USA

10.30 *FA-1.3:IL01* **Self Diagnostic EB-PVD Thermal Barrier Coatings**

J.R. NICHOLLS, R.G. WELLMAN, R. STEENBAKKER, Cranfield University, Cranfield, Bedford, UK; J.P. FEIST, STS Ltd, c/o Imperial College, London, UK

11.00 *FA-1.3:IL03* **Inhibition of Interdiffusion in NiCrAlY Coated γ -TiAl by Introduction of a Ytria Partially Stabilized Zirconia(PYSZ) Layer**

FUHUI WANG, YUXIAN CHENG, WEN WANG, State Key Laboratory for Corrosion and Protection, Institute of Metal Research, CAS, Shenyang, China

Sub-session FB-2.3 - Complex Hydrides

Room: AUDITORIUM

Chair: M. FICHTNER, Germany

- 9.00 *FB-2.3:IL05* **Electrochemical Formation and Regeneration of Alane**
R. ZIDAN, B.L. GARCIA-DIAZ, C.S. FEWOX, Savannah Rivers National Laboratory, Aiken, SC, USA
- 9.30 *FB-2.3:IL06* **Hydrogen Storage Materials - Recent Development and Future Strategy of Japan**
E. AKIBA, AIST, Tsukuba, Ibaraki, Japan
- 10.00 *FB-2.3:IL07* **Evidence for Hydrogen Transport in Deuterated LiBH₄ from Low-temperature Raman-scattering Measurements and First-principles Calculations**
A. BORGSCHELTE, Laboratory 138 Hydrogen & Energy, Empa - Materials Science & Technology, Dübendorf, Switzerland
- 10.30 *FB-2.3:IL08* **Approaches to Modify Complex Hydrides Towards Viable Onboard Hydrogen Storage**
R. MOHTADI, P.K. SIVASUBRAMANIAN, Toyota Research Institute of North America, Ann Arbor, MI, USA; **T. MATSUNAGA**, Toyota Motor Corporation; **J. GRAY**, **D. KNIGHT**, **R. ZIDAN**, Savannah River National Laboratory, USA
- 11.00 *Break*

Sub-session FB-2.4 - Chemical Hydrides

Room: AUDITORIUM

Chair: A. BORGSCHELTE, Switzerland

- 11.30 *FB-2.4:IL01* **Synthesis and Properties of Nanocomposites Based on Tetrahydroborates**
M. FICHTNER, Institute of Nanotechnology, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
- 12.00 *FB-2.4:IL02* **Catalyzed Dehydrogenation of Amine-borane Fuel Blends**
R.T. BAKER, Dept. of Chemistry and Centre for Catalysis Research and Innovation, University of Ottawa, Ottawa, Canada
- 12.30 *FB-2.4:IL03* **Chemical Hydrogen Storage in NHXBHX Materials**
T. AUTREY, Fundamental Sciences Directorate, Pacific Northwest National Laboratory, Richland, WA, USA

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

Room: **VENERE**

Chair: H. LUSTFELD, Germany

- 9.30 *FC-3:IL01* **Membraneless Fuel Cells as Microscale Power Sources and Analytical Platforms**
P.J.A. KENIS, Dept. of Chemical & Biomolecular Engineering, University of Illinois, Urbana, IL, USA
- 10.00 *FC-3:L03* **Investigation of a Passive DMFC Mini-stack at Ambient Temperature**
A.S. ARICO¹, V. BAGLIO, A STASSI, V. ANTONUCCI, CNR-ITAE, Messina, Italy
- 10.20 *FC-3:L04* **Novel PVA-SSA-HPA-Bridged-Mixed-Matrix-Membrane Electrolytes for DMFCs**
S.D. BHAT¹, A.K. SAHU¹, A. JALAJAKSHI¹, S. PITCHUMANI¹, P. SRIDHAR¹; A.K. SHUKLA², ¹CSIR-Central Electrochemical Research Institute-Madras Unit, Chennai, India; ²Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore, India
- 10.40 *Break*
- 11.10 *FC-3:L05* **Pt alloys on Carbon Nanostructures as Electrocatalysts for Direct Methanol Fuel Cell**
L. GIORGI, R. GIORGI, S. GAGLIARDI, E. SALERNITANO, TH. DIKONIMOS, N. LISI, E. SERRA, ENEA Casaccia Research Center, Rome Italy; M. ALVISI, ENEA Brindisi Research Center, Brindisi, Italy
- 11.30 *FC-3:IL06* **Tomographic Diagnostics of Electric Current Fluctuations in Fuel Cells**
H. LUSTFELD, J. HIRSCHFELD, IFF-1, Forschungszentrum Jülich; M. REIBEL, Fachhochschule Aachen, Abteilung Jülich; B. STEFFEN, JSC, Forschungs-zentrum Jülich, Jülich, Germany

Session FD-2 - Capacitive Storage

Room: GIOVE

Chair: W. SUGIMOTO, Japan

- 9.30 *FD-2:IL05* **3D-integrated All-solid-state Capacitors**
F. ROOZEBOOM, E. LANGEREIS, N. LEICK, M.C.M. VAN DE SANDEN, W.M.M. KESSELS, Eindhoven University of Technology, Eindhoven, The Netherlands; J. KLOOTWIJK, W. DEKKERS, Philips Research, Eindhoven, The Netherlands; E. TOIS, M. TUOMINEN, ASM Microchemistry Ltd, Helsinki, Finland; Y. LAMY, K. JINESH, W. BESLING, A. ROEST, NXP Semiconductors, Eindhoven, The Netherlands; C. BUNEL, IPDIA, Caen, France
- 10.00 *FD-2:IL06* **Design of Nanostructured Oxides for Advanced Electro-chemical Supercapacitors**
CHI-CHANG HU, KUO-HSIN CHANG, CHAO-MING HUANG, HSIN-YI GUO, JING-MEI LI, Dept. of Chemical Engineering, National Tsing Hua University, Hsin-Chu, Taiwan
- 10.30 *FD-2:L07* **Printed Supercapacitor as Hybrid Device with Enzymatic Power Source**
J. KESKINEN, E. SIVONEN, VTT Technical Research Centre of Finland, Tampere, Finland; M. BERGELIN, J.-E. ERIKSSON, P. SJÖBERG-EEROLA, Abo Akademi, PCC/Inorganic Chemistry, Turku, Finland; M. VALKIAINEN, M. SMOLANDER, A. KOIVULA, H. BOER, VTT Technical Research Centre of Finland, VTT, Finland
- 10.50 *Break*
- Chair:* J. KESKINEN, Finland
- 11.20 *FD-2:L08* **Electrochemical Deposition of Vanadium Oxides for Supercapacitors: The Key Factor of Determining the V^{5+}/V^{4+} Ratio**
JING-MEI LI, K.H. CHANG, C.C. HU, National Tsing Hua University, Hsin-Chu, Taiwan
- 11.40 *FD-2:IL09* **Mesostructured Materials for Electrochemical Capacitors**
B. DUNN, Dept. of Materials Science and Engineering, University of California, Los Angeles, CA, USA
- 12.10 *FD-2:IL10* **Electrode Materials for Hybrid Supercapacitors**
D. CERICOLA, R. KÖTZ, P. NOVAK, A. WOKAUN, General Energy Research Dept., Paul Scherrer Institut, Villigen PSI, Switzerland

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

Room: URANO

Chair: A. SHAKOURI, USA

- 9.00 *FE-2:IL13* **Synthesis, Structure and Thermoelectric Properties of Complex Rare Earth Antimonides**
A. CHAMOIRE, J.C. TEDENAC, Institut Charles Gerhardt Montpellier, Equipe PMOF, UMR 5253, Univ. Montpellier II, Montpellier, France; C. ESTOURNÈS, CIRIMAT, PNF2 MHT, Univ. Paul Sabatier, Toulouse, France; T. CAILLAT, Jet Propulsion Lab., Caltech, Pasadena, CA, USA; **F. GASCOIN**, ENSICAEN CNRS, UMR 6508, Lab. CRISMAT, Caen, France
- 9.30 *FE-2:IL14* **Functions of Key Structural Unit and Performance Optimization in Novel Thermoelectric Compounds**
L.D. CHEN, W. ZHANG, J.H. YANG, X. SHI, X.Y.SHI, J. YANG, X.H. CHEN, X.Y. HUANG, Shanghai Institute of Ceramics, CAS, Shanghai, China
- 10.00 *FE-2:L15* **Effect of Strontium and Europium Substitutions on Thermoelectric Properties in Silicon-Based Clathrate Compounds**
H. ANNO*, T. NAKABAYASHI, M. HOKAZONO, Tokyo University of Science, Yamaguchi, Sanyo Onoda, Japan; *JST, CREST, Tokyo, Japan
- 10.20 *FE-2:L16* **Thermal Expansion of Clathrate Compounds $Ba_8M_x\{Si,Ge\}_{46-x}$ ($M = Cu, Zn, Pd, Ag, Cd, Pt, Au$)**
M. FALMBIGL, P.F. ROGL, Institute of Physical Chemistry, University of Vienna, Wien, Austria; M. KRIEGISCH, H. MÜLLER, E. BAUER, S. PASCHEN; Inst. of Solid State Physics, Vienna University of Technology, Wien, Austria
- 10.40 *Break*

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

Room: URANO

Chair: L.D. CHEN, China

- 11.10 *FE-2:IL17* **High Temperature Thermoelectric Properties of a Homologous Series of n-type Boron Icosahedra Compounds: a Possible Counterpart to p-type Boron Carbide**
TAKAO MORI, International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Tsukuba, Japan
- 11.40 *FE-2:IL18* **Synthesis, Structural and Chemical Characterizations, and Transport Properties of $\text{Mo}_{3-x}\text{Ru}_x\text{Sb}_{7-y}\text{Te}_y$**
C. CANDOLFI, B. LENOIR, J. LESZCZYNSKI, P. MASSCHELEIN, C. CHUBILLEAU, A. DAUSCHER, Institut Jean Lamour, CNRS-Nancy Université-UPVM, ENSMN, Nancy, France; E. GUILMEAU, CRISMAT-ENSICAEN, CNRS/UMR 6508, Caen, France; J. HEJTMANEK, Institute of Physics, Academy of Sciences of the Czech Republic, Praha, Czech Republic; J. TOBOLA, Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Krakow, Poland; S.J. CLARKE, Dept. of Chemistry, University of Oxford, Inorganic Chemistry Lab., Oxford, UK; R.I. SMITH, ISIS Facility, Rutherford Appleton Lab., Chilton, Didcot, Oxon, UK
- 12.10 *FE-2:L19* **Tuning of Thermoelectric Properties in Double Doped Skutterudites from Electronic Structure Calculations**
J. TOBOLA¹, J. LESZCZYNSKI², K. KUTORASINSKI¹, A. DAUSCHER², B. LENOIR², ¹Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Krakow, Poland; ²Institut Jean Lamour, UMR CNRS-Nancy Université-UPVM 7198, ENSMN, Nancy, France
- 11.30 *FE-2:L20* **Thermoelectric Properties of the Heavy Element Doped Heusler Fe₂VAl Alloy Prepared by Powder Metallurgy Technique**
M. MIKAMI, K. KOBAYASHI, National Institute of Advanced Industrial Science and Technology, Nagoya, Japan; S. TANAKA, Dept. of Environmental and Materials Engineering, Nagoya Institute of Technology, Nagoya, Japan

WEDNESDAY JUNE 16 MORNING

Session FG-2 - Thin-film Photovoltaics

Room: LE PLEIADI

Chair: M. SYMKO-DAVIES, USA

- 9.00 *FG-2:IL08* **CdTe Thin Film Photovoltaics - Challenges in Materials Science**
W. JAEGERMANN, Surface Science Division, Institute of Materials Science, Darmstadt University of Technology, Darmstadt, Germany
- 9.30 *FG-2:IL09* **Advances in Low Temperature Grown CdTe Solar Cells on Glass and Polymer Films**
S. BÜCHLER, J. PERRENOUD, B. SCHAFFNER, **A.N. TIWARI**, Lab. for Thin Films and Photovoltaics, EMPA, Dübendorf, Switzerland
- 10.00 *FG-2:IL10* **Electrical Characterization of Thin Film CdTe Solar Cells**
Y. PROSKURYAKOV, K. DUROSE, Durham Centre for Renewable Energy, Physics Dept., University of Durham, Durham, UK
- 10.30 *Break*

Session FG-3 - Emerging and New Generation Solar Cells

Room: LE PLEIADI

Chair: T. MARKVART, UK

- 11.00 *FG-3:IL02* **Novel Photoactive Materials for Polymer Solar Cells**
S. LUZZATI, M. CATELLANI, E. KOZMA, D. KOTOWSKI, Istituto per lo Studio delle Macromolecole (ISMAC), CNR, Italy
- 11.30 *FG-3:L03* **Vertical Stratification in P3HT:PCBM Organic Solar Cells**
P.C. DASTOOR, Centre for Organic Electronics, University of Newcastle, Callaghan, NSW, Australia
- 11.50 *FG-3:L04* **The Influence of the Electron Acceptor on the Optical Constants of the Photoactive Layer of a Polymer Solar Cell**
P. MORVILLO, E. BOBEICO, S. ESPOSITO, ENEA, Portici (NA), Italy
- 12.10 *FG-3:L05* **The Suitability of Organic Solar Cells for Different Indoor Conditions**
B. MINNAERT, P. VEELAERT, University College Ghent, Ghent, Belgium
- 12.30 *FG-3:IL01* **Applications of Metal Oxides in Organic Photovoltaics**
D.C. OLSON¹, J.M. ADAMSON^{1,2}, K.X. STEIRER^{1,2}, N.E. WIDJONARKO^{1,3}, A. SIGDEL^{1,4}, M.S. WHITE^{1,3}, M.T. LLOYD¹, J.J. BERRY¹, D.S. GINLEY¹, ¹National Renewable Energy Laboratory, Golden, CO, USA; ²Colorado School of Mines, Golden, CO, USA; ³University of Colorado, Boulder, CO, USA; ⁴University of Denver, Denver, CO, USA

WEDNESDAY JUNE 16 MORNING

Session FH-2 - CPV Cell Components, Module Assembly and Testing

Room: ORSA MINORE

Chair: C.E. KENNEDY, USA

- 9.00 *FH-2:IL04* **Towards Accurate Reliability Tests for CPV Modules**
A.R. LAGUNAS, I. PETRINA, J. DIAZ, CENER, Sarriguren (Navarra), Spain
- 9.30 *FH-2:L06* **Effects of High Concentration of Sunlight on Tunneling in Multi-Junction Solar Cells**
E.A. KATZ, A. BRAUN, B. HIRSCH, J.M. GORDON, Dept. of Solar Energy and Environmental Physics, Ben-Gurion University of the Negev, Sede Boqer, Israel; **J. BLAUSTEIN**, Institutes for Desert Research, Ben-Gurion University of the Negev, Sede Boqer, Israel; **W. GUTER**, A.W. BETT, Fraunhofer Institut für Solare Energiesysteme, Freiburg, Germany
- 9.50 *FH-2:L07* **Solar Divergence Collimators for Collector Tests**
E. SANI, P. SANSONI, D. FONTANI, F. FRANCIANI, L. MERCATELLI, D. JAFRANCESCO, CNR-INOA Istituto Nazionale di Ottica Applicata, Firenze, Italy
- 10.10 *FH-2:IL08* **ENEA's Activities on C-PV Technology: Perspectives in Research, Development and Demonstration**
A. SARNO, G. GRADITI, C. CANCRO, R. FUCCI, F. ROCA, C. PRIVATO, ENEA, Portici (NA), Italy
- 10.40 *Break*

Session FH-3 - CSP Concentrators and Heat Collection Elements

Room: ORSA MINORE

Chair: G. SIEFER, Germany

- 11.10 *FH-3:IL02* **Solar Concentrators for Power Generation: Indian Experience**
N.D. KAUSHIKA, Bharati Vidyapeeth's College of Engineering, New Delhi, India
- 11.40 *FH-3:IL03* **Advances in Reflector and Solar Selective Materials for Application to Concentrating Solar Power Systems**
C.E. KENNEDY, National Renewable Energy Laboratory, Golden, CO, USA
- 12.10 *FH-3:L04* **Test Facility for Absorber Specimen of Solar Tower Power Plants**
B. HOFFSCHMIDT, K. GEIMER, J. GÖTTSCHE M. SCHMITZ, **M. SAUERBORN**, Solar-Institut Jülich, Jülich, Germany

Session FI-2 - Materials Design and Device Development

Room: SIRIO

Chair: F. MAURY, France

- 9.00 *FI-2:IL11* **P-type Transparent Semiconductors: Synthesis and Applications**
J. TATE, A. ZAKUTAYEV, H. PLATT, D. KESZLER, Oregon State University, Corvallis, OR, USA; C. HEIN, T. MEYER, A. KLEIN, Darmstadt University of Technology, Germany
- 9.30 *FI-2:IL12* **Transparent Conductors on Polymer Films**
M. FAHLAND, T. VOGT, A. SCHÖNBERGER, Fraunhofer FEP, Dresden, Germany; U. PARTSCH, Fraunhofer IKTS, Dresden, Germany
- 10.00 *FI-2:L13* **Emerging p-type Transparent Conductive Oxides: Theoretical and Experimental Studies**
M. MODREANU¹, M. NOLAN¹, E. CHIKOIDZE², B. SERVET³, G. GARRY³, G. HUYBERECHTS⁴, ¹Tyndall National Institute, Cork, Ireland; ²University of Versailles CNRS (GEMAC), Meudon, France; ³Thales Research & Technology France, Palaiseau cedex, France; ⁴Umicore Group R&D, Olen, Belgium
- 10.20 *FI-2:L14* **Effects of Ag Doping on the Performance of ZnO-based Thin Film Transistor**
DEUK-HEE LEE, S.Y. LEE, Center for Energy Materials Research, Korea Institute of Science and Technology, Seoul, Republic of Korea; S. KIM, Dept. of Electrical Engineering and Institute for Nanoscience, Korea University, Seoul, Republic of Korea
- 10.40 *Break*

Session FI-2 - Materials Design and Device Development

Room: SIRIO

Chair: J. TATE, USA

- 11.10 *FI-2:IL17* **Structure Controlled TCOs for Solar Cells Using Fast Growth Rate Atmospheric Pressure Chemical Vapour Deposition**
D.W. SHEEL, H.M. YATES, P. EVANS, University of Salford, Manchester, UK; U. DAGKALDIRAN, A. GORDIJN, F. FINGER, IEF5-Photovoltaik, Forschungszentrum Julich GmbH, Julich, Germany; C.BAILIFF, S. FAY, S.NICOLAY, EPFL, IMT, Neuchatel, Switzerland
- 11.40 *FI-2:L18* **Phosphorus Doped ZnO, p-type and n-type, a Material for Photovoltaic and Other Applications**
HAO GONG, GUANGXIA HU, Dept. Mat. Sci. Eng., National University of Singapore, Singapore
- 12.00 *FI-2:L19* **Tuning Color of p-type Wide Band Gap Semiconductor via Their Nanostructuring**
B. CHAVILLON, C. DOUSSIER-BROCHARD, R. SRINIVASAN, L. CARIO, L. LE PLEUX, Y. PELLEGRIN, E. BLART, F. ODOBEL, S. JOBIC, Institut des Matériaux Jean Rouxel, Nantes, France
- 12.20 *FI-2:L20* **Conductive Self-cleaning Films Deposited by Aerosol Assisted Chemical Vapour Deposition**
M.G. NOLAN, J.A. HAMILTON, I.M. POVEY, M.E. PEMBLE, Tyndall National Institute, University College Cork, Cork, Ireland
- 12.40 *FI-2:IL16* **Amorphous Transparent Conductors for Photovoltaic Application**
J.J. BERRY¹, A.K. SIGDEL², T. GENNETT¹, D.C. OLSON¹, D.S. GINLEY¹, J.D. PERKINS¹, ¹National Renewable Energy Laboratory, Golden CO, USA; ²Dept. of Physics and Astronomy, University of Denver, Denver, CO, USA

Session FJ-2 - Electro-optical Characterisation

Room: ORSA MAGGIORE

Chair: F. SO, USA

- 9.00 *FJ-2:L07* **Origin of the Green Light Emission in Polyfluorene Based Diodes by Trap Investigations**
O. HAAS¹, J.C. SANCHEZ¹, C. RENAUD¹, P. LE RENDU¹, S.H. YANG², H.M. SHIH², T.P. NGUYEN¹, ¹Institut des Matériaux Jean Rouxel, CNRS- University of Nantes, Nantes, France; ²Dept. of Applied Chemistry, National Chiao Tung University, Hsinchu, Taiwan, Republic of China
- 9.25 *FJ-2:L08* **Red-emitting CaSrAl₂SiO₇:Eu³⁺ + Phosphor for Near-Ultraviolet Light-emitting Diodes**
YUHUA WANG, H.Y. JIAO, Dept. of Materials Science, School of Physical Science and Technology, Lanzhou University, Lanzhou, P.R. China
- 9.50 *FJ-2:IL09* **Interfacial Modifications in Organic Optoelectronic Devices**
J.W.P. HSU, Sandia National Laboratories, Albuquerque, NM, USA
- 10.25 *Break*

Chair: A. DADGAR, Germany

- 10.55 *FJ-2:IL10* **Defects and the Efficiency of GaN-based LEDs**
D. ZHU, C. MCALEESE, M.J. KAPPERS, C.J. HUMPHREYS, Dept. of Materials Science and Metallurgy, University of Cambridge, Cambridge, UK
- 11.30 *FJ-2:L11* **Size-dependent Recombination Dynamics in ZnO Nanowires**
J.S. REPARAZ, M.R. WAGNER, A. HOFFMANN, Institut für Festkörperphysik, Technische Universität, Berlin, Germany; F. GÜELL, A. CORNET, J.R. MORANTE, M2E-MIND-IN2UB, Depart. d'Electronica, Universitat de Barcelona, Barcelona, Catalunya, Spain
- 11.55 *FJ-2:L12* **Hydrogen in InN: Ubiquitous Phenomena in Molecular Beam Epitaxy Grown Material**
V. DARAKCHIEVA^{1,2}, K. LORENZ¹, N.P. BARRADAS¹, E. ALVES¹, M.-Y. XIE^{1,2}, B. MONEMAR², ¹Instituto Tecnológico e Nuclear, Portugal; ²IFM, Linköping University, Sweden; M. SCUBERT, University of Nebraska-Lincoln, USA; W.J. SCHAFF, Cornell University, USA; C.L. HSIAO, L.C. CHEN, National Taiwan University, Taiwan; L.W. TU, National Sun Yat-Sen University, Taiwan; T. YAMAGUCHI, Y. NANISHI, Retsumeikan University, Japan

Session FF-4 - Functional Materials

Room: **SMERALDO 1**

Chair: F. TAVASSOLI, France

- 9.00 *FF-4:IL02* **Study of Radioluminescence on Functional Ceramics for Nuclear Fusion Application**
T. SHIKAMA, S. NAGATA, H. KATSUI, B. TSUCHIYA, Institute for Materials Research, Tohoku University, Sendai, Japan
- 9.30 *FF-4:IL03* **Performance Assessment of Ceramic Breeder Materials and Their Testing**
J.G. VAN DER LAAN, Nuclear Research & Consultancy Group, Petten, The Netherlands
- 10.00 *FF-4:IL04* **Utilization of Hybride Materials in Nuclear Reactors**
K. KONASHI, M. YAMAWAKI, Institute for Materials Research, Tohoku University, Ibaraki, Japan; Dept. of Energy, Tokai University, Kanagawa, Japan
- 10.30 *FF-6:IL01* **Computer Simulation of Primary Radiation Damage**
K. NORDLUND, Dept. of Physics, University of Helsinki, Helsinki, Finland
(rescheduled time from Session FF-6 as for Author request)
- 11.00 *Break*

Room: **SMERALDO 1**

Chair: T. SHIKAMA, Japan

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

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

Session FF-9 - System Integration and Interface Design

- 12.00 *FF-9:IL01* **Joining SiC Ceramics and Composites for Fusion and Nuclear Applications**
M. FERRARIS, V. CASALEGNO, S. HAN, S. RIZZO, M. SALVO, A. VENTRELLA, Politecnico di Torino, Dip. di Scienza dei Materiali e Ingegneria Chimica-DISMIC, Torino, Italy
- 12.30 *FF-9:IL02* **Design and Integration of ITER Divertor Components**
T. HIRAI, F. ESCOURBIAC, T. JOKINEN, V. KOMAROV, A. MARTIN, M. MEROLA, ITER Organization, St Paul-lez-Durance, France

WEDNESDAY JUNE 16 MORNING

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

Room: **AMBRA**

Chair: H. TANABE, Japan

- 9.30 *FF-10.2:IL06* **Sulfur Incorporation in Borosilicate Glass - A Challenge for Vitrification Facilities Processing High Sulfur Bearing HLLW**
S. WEISENBURGER, Karlsruhe Institute of Technology (KIT), Institut für Nukleare Entsorgung (INE), Eggenstein-Leopoldshafen, Germany
- 10.00 *FF-10.2:IL07* **An Innovative Hybrid Process Involving Plasma in a Cold Crucible Melter Devoted to the Future Intermediate Level Waste Treatment: The SHIVA Technology**
F. LEMONT, P. CHARVIN, A. RUSSELLO, K. POIZOT, CEA - French Atomic Energy Commission, Bagnols sur Cèze, France
- 10.30 *FF-10.2:L08* **Recovery of Long-lived Minor Actinides from High Active Waste Solutions Using Innovative Partitioning Processes**
G. MODOLO, D. BOSBACH, Inst. for Energy Research, Forschungszentrum Jülich GmbH, IEF-6, Jülich, Germany; **A. GEIST**, Inst. für Nukleare Entsorgung, Forschungszentrum Karlsruhe GmbH, INE, Karlsruhe, Germany; **R. MALMBECK**, European Commission, JRC, Inst. for Transuranium Elements, Karlsruhe, Germany
- 10.50 *Break*

Session FF-10.3 - Waste Form Modeling, Performance and Characterisation

Room: **AMBRA**

Chair: B. BOSBACH, Germany

- 11.20 *FF-10.3:IL01* **Development of New Waste Forms to Immobilize Iodine-129 Released from Spent Fuel Reprocessing Plant**
H. TANABE, T. SAKURAGI, Radioactive Waste Management Funding and Research Center, Tokyo, Japan
- 11.50 *FF-10.3:L03* **Is the Aqueous Corrosion of Borosilicate Glass Really Controlled by Diffusion Processes?**
T. GEISLER, A. JANSSEN, R. DENKLER, J. BERNDT, T. STEPHAN, A. PUTNIS, Institut für Mineralogie, University of Münster, Münster, Germany; Dept. of the Geophysical Sciences, University of Chicago, Chicago, IL, USA

Session FK-5 - Vortex Lattice Physics

Room: **SMERALDO 2**

Chair: X. OBRADORS, Spain

- 8.30 *FK-5:IL01* **Summation of Strong Pinning Forces**
F.M. SAUERZOPF, Atominstytut, Vienna University of Technology, Vienna, Austria
- 9.00 *FK-5:IL02* **Type-1.5 Superconductivity**
V.V. MOSHCHALOV, INPAC-Institute for Nanoscale Physics and Chemistry, Katholieke Universiteit Leuven, Leuven, Belgium
- 9.30 *FK-5:IL03* **Critical Current Densities in Ba(Fe,Co)₂As₂ and FeTe_{1-x}Sex**
T. TAMEGAI, Y. TSUCHIYA, T. TAEN, Y. NAKAJIMA, Dept. of Applied Physics, The University of Tokyo and JST-TRIP, Tokyo, Japan; **S. OKAYASU**, Advanced Sci. Res. Center, JAEA, Tokai, Ibaraki, Japan; **M. SASASE**, The Wakasa-wan Energy Res. Center, Nagatani, Fukui, Japan
- 10.00 *FK-5:IL04* **Non-centrosymmetric Superconductors: Extreme Vortex Pinning in CePt₃Si and Li₂Pt₃B**
C.F. MICLEA, Los Alamos National Laboratory, Los Alamos, NM, USA; **A.C. MOTA**, **M. NICKLAS**, **F. STEGLICH**, Max-Planck-Inst. for Chemical Physics of Solids, Dresden, Germany; **M. SIGRIST**, Inst. for Theoretical Physics, ETH Zurich, Switzerland; **M.B. MAPLE**, Dept. of Physics and Inst. for Pure and Applied Physical Sciences, Univ. of California-San Diego, La Jolla, CA, USA; **E. BAUER**, Inst. für Festkörperphysik, Technische Univ. Wien, Wien, Austria
- 10.30 *Break*

Session FK-6 - Synthesis and Processing

Room: **SMERALDO 2**

Chair: F.M. SAUERZOPF, Austria

- 11.00 *FK-6:IL01* **Progress in Chemical Solution Approaches to Nanocomposite Superconducting Films**
X. OBRADORS, T. PUIG, A. POMAR, S. RICART, A. LLORDÉS, A. PALAU, R. VLAD, H. CHEN, K. ZALAMOVA, F. SANDIUMENGE, P. ABELLÁN, F. MARTÍNEZ, M. GIBERT, X. GRANADOS, Institut de Ciència de Materials de Barcelona, CSIC Campus de la UAB, Bellaterra, Catalonia, Spain
- 11.30 *FK-6:IL02* **Stability Conditions for Charge Density Wave and Super-conducting States in Intercalated 1T-dichalcogenides**
A. GAUZZI, A. SELLAM, G. ROUSSE, M. D'ASTUTO, A. SHUKLA, M. CALANDRA, F. MAURI, IMPMC, Université Pierre et Marie Curie and CNRS, Paris, France; E. GILIOLI, IMEM-CNR, Parma, Italy; I. MAZIN, Naval Research Laboratory, Washington, DC, USA
- 12.00 *FK-6:L03* **Deposition of YBCO FOR 2G Conductors Using Laser Direct Write**
M. OSOFSKY, A. PIQUÉ, K. METKUS, T.E. SUTTO, Naval Research Lab., Washington, DC, USA; M. RUPICH, S. SATHYAMURTHY, American Superconductor, Inc., Devens, MA, USA
- 12.20 *FK-6:L04* **Development of Low-loss (Bi,Pb)-2223 Tapes with Inter-filamentary Resistive Barriers**
R. INADA, Y. NAKAMURA, A. OOTA, Toyohashi University of Technology, Toyohashi, Aichi, Japan; C.S. LI, P.X. ZHANG, Northwest Institute for Nonferrous Metal Research, Xi'an, Shaanxi, P.R. China

Session FL-1 - Advances in Biomaterials

Room: **SMERALDO 3**

Chair: N. PUGNO, Italy

- 8.30 *FL-1:L25* **In-situ Investigation of Temperature Influence on Calcium Phosphate Cement Hydration**
F. GOETZ-NEUNHOEFFER, J. NEUBAUER, University Erlangen, GeoZentrum Nordbayern, Mineralogy, Erlangen, Germany
- 8.50 *FL-1:L26* **A Novel Rich-phosphate Coating on Zirconia with High Bonding Strength to Surface**
A. VALANEZHAD, K. TSURU, M. MICHITO, G. KAWACHI, S. MATSUYA, K. ISHIKAWA, Dept. of Biomaterials, Fac. of Dental Science, Kyushu University, Fukuoka, Japan; Dept. of Dental Eng., Fukuoka Dental College, Fukuoka, Japan
- 9.10 *FL-1:L28* **Fabrication of Bioactive Organic Polymer-apatite Nuclei Composite**
T. YABUTSUKA, M. HIBINO, T. YAO, Graduate School of Energy Science, Kyoto University, Kyoto, Japan
- 9.30 *FL-1:L29* **Laser Rapid Prototyping of Microstructured Medical Devices using Inorganic-organic Hybrid Materials**
R.J. NARAYAN, S.D. GITTARD, A. DORAISWAMY, Dept. of Biomedical Engineering, University of North Carolina, Chapel Hill, USA; A. OVSIANIKOV, B. CHICHKOV, Laser Zentrum Hannover, Hannover, Germany
- 9.50 *FL-1:L30* **Nanocrystalline Apatite Coatings and Osteoinduction**
H. AUTEFAGE, C. COMBES, S. CAZALBOU, C. REY, University of Toulouse, CIRIMAT, UPS-INPT-CNRS, ENSIACET, Toulouse, France; F. BRIAND-MÉSANGE, INSERM U563, CPTP, Lipoproteins and Lipid Mediators Lab., CHU Purpan, Toulouse, France; A. GOMEZ-BROUCHET, Pathological Anatomy and Cytology Dept., CHU Toulouse-Rangueil, Toulouse, France; S. PALIERNE, A. AUTEFAGE, D. MATHON, Small Animal Surgery Dept., National Veterinary School of Toulouse, Toulouse, France; S. GONÇALVÈS, Teknimed, L'Union, France; P. SWIDER, University of Toulouse, Biomechanics Lab. EA3697, CHU Purpan, Toulouse, France

10.10 *Break*

Session FL-4 - Regenerative Medicine and Tissue Engineering

Room: **SMERALDO 3**

Chair: E. JABBARI, USA

- 10.30 *FL-4:IL01* **Is Nanotechnology Really Increasing Tissue Growth? Separating the Hype from Data**
T.J. WEBSTER, Division of Eng. and Dept. of Orthopaedics, Brown University, Providence, RI, USA
- 11.00 *FL-4:IL02* **Calcium-deficient Hydroxyapatite for Metabolism of Subsequently Formed Bone Tissue**
K. IOKU, M. KAMITAKAHARA, Graduate School of Environmental Studies, Tohoku University, Sendai, Miyagi, Japan; T. IKEDA, Graduate School of Biomedical Sciences, Nagasaki University, Nagasaki, Japan
- 11.30 *FL-4:L03* **Self-collapse and Sliding of Nanotubes in a Bundle**
N. PUGNO, Lab. of Bio-inspired Nanomechanics "Giuseppe Maria Pugno", Dept. of Structural Engineering and Geotechnics, Politecnico di Torino, Torino, Italy; National Inst. of Nuclear Physics (INFN), National Labs of Frascati, Frascati, Italy; National Inst. of Metrological Research (INRIM), Torino, Italy; Consorzio Nazionale Interuniversitario per le Scienze Fisiche della Materia (CNISM), Roma, Italy
- 11.50 *FL-4:L05* **Modeling the Elastic Anisotropy of Woven Hierarchical Tissues: Experimental Comparison on Biological Materials and Design of a New Class of Scaffolds**
N.M. PUGNO, QIANG CHEN, Lab. of Bio-Inspired Nanomechanics "Giuseppe Maria Pugno", Dept. of Structural Engineering and Geotechnics, Politecnico di Torino, Torino, Italy
- 12.10 *FL-4:IL07* **Nano-biointerface for Medical Application**
Y. NAGASAKI, K. YOSHIMOTO, Tsukuba Research Center for Interdisciplinary Materials Science (TIMS), Center for Tsukuba Advanced Research Alliance (TARA) and Master's School of Medical Sciences, University of Tsukuba, Satellite Lab. of International Center for Materials Nanoarchitectonics, Tsukuba, Ibaraki, Japan
- 12.40 *FL-4:L08* **Super-hydrophobic Surfaces by Direct Replication of Natural Leaves**
E. LEPORE, N. PUGNO, Lab. of Bio-Inspired Nanomechanics "Giuseppe Maria Pugno", Dept. of Structural Engineering and Geotechnics, Politecnico di Torino, Torino, Italy

THURSDAY JUNE 17 MORNING

Sub-session FA-1.5 - Corrosion and Erosion

Room: ALBA 2

Chair: A. EPISHIN, Switzerland

- 9.00 *FA-1.5:IL01* **Materials Performance in Advanced Steam Cycle and Oxy-fuel Combustion Systems**
K. NATESAN, Z. ZENG, Argonne National Laboratory, Argonne, IL, USA
- 9.30 *FA-1.5:IL02* **Modelling Solid Particle Erosion of Steels at Elevated Temperatures: A New Approach to CFD Modelling in 3-Dimensions**
M.M. STACK, S.M. ABDELRAHMAN, B.D JANA, Dept. of Mechanical Engineering, University of Strathclyde, Glasgow, UK
- 10.00 *FA-1.5:IL03* **Important Compositional and Microstructural Factors Affecting the High-Temperature Degradation of Metallic Alloys and Coatings**
B. GLEESON, University of Pittsburgh, Dept. Mechanical Engineering & Materials Science, Pittsburgh, PA, USA
- 10.30 *FA-1.5:IL04* **Electrochemical Investigation on Hot Corrosion of Inconel 740 Alloy in Simulated Coal Ash Environment**
YINGLU JIANG, XINGBO LIU, Mechanical & Aerospace Engineering Dept., West Virginia University Morgantown, WV, USA
- 10.50 *Break*

Sub-session FA-1.4 - Long-term Creep and Fatigue

Room: ALBA 2

Chair: M.M. STACK, UK

- 11.20 *FA-1.4:IL01* **Long-term Mechanical Stability in USC Steam Turbine Environments**
J.A. HAWK, USDOE, NETL, Albany, OR, USA
- 11.50 *FA-1.4:IL02* **Degradation of Ni-Base Superalloys under High Temperature Creep Conditions**
A. EPISHIN, T. LINK, Technical University of Berlin, Berlin, Germany; B. FEDELICH, H. KLINGELHÖFFER, Federal Institute for Materials Research and Testing, Berlin, Germany; M. NAZMY, M. STAUBLI, ALSTOM Ltd., Baden, Switzerland
- 12.20 *FA-1.4:IL03* **Creep Resistant Steels for Coal Power Plant Applications**
R. VISWANATHAN, Electric Power Research Institute, Palo Alto, CA, USA

Sub-session FB-2.5 - Carbon Based Materials

Room: **AUDITORIUM**

Chair: M. HIRSCHER, Germany

- 8.45 *FB-2.5:IL01* **Hydrogen Storage in Nanoporous Structures**
R. CHAHINE¹, M.-A. RICHARD¹, D. MORI², K. HIROSE², ¹Institut de Recherche sur l'Hydrogene, Universite du Quebec a Trois-Rivieres, Quebec, Canada; ²Toyota Motor Corp., Fuel Cell System Development Div., Shizuoka, Japan
- 9.15 *FB-2.5:IL02* **Neutron Scattering Studies of Hydrogen Storage Materials**
D.K. ROSS, D.J. BULL, D. MOSER, D. ROACH, Z. MILEEVA, I. SHABALIN, W.A. OATES, Inst. for Materials Research, Univ. of Salford, Manchester, UK
- 9.45 *FB-2.5:IL03* **Novel Catalytic Effects of Fullerene for Complex and Metal Hydrides**
M.S. WELLONS, J. TEPROVICH, R. ZIDAN, Savannah River National Laboratory, Aiken, SC, USA
- 10.15 *FB-2.5:IL04* **High Pressure Hydrogen Storage in Zeolite Templated Carbon**
S. ITTISANRONNACHAI, LI-XIANG LI, **H. NISHIHARA**, T. KYOTANI, Inst. for Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; M. ITO, Nissan Research Center, Nissan Motor Co. Ltd., Japan
- 10.45 *FB-2.5:IL05* **Metal Loaded Carbons**
T. STERIOTIS, Institute of Physical Chemistry, NCSR "Demokritos", Athens, Greece
- 11.15 *Break*

THURSDAY JUNE 17 MORNING

Room: AUDITORIUM

Chair: A.J. GOUDY, USA

Sub-session FB-2.2 - Metal Hydrides

- 11.45 *FB-2.2:IL08* **Size-selected Rare Earth and Palladium Nanoparticles for Hydrogen induced Switching and Sensing Devices**
B.R. MEHTA, Department of Physics, Indian Institute of Technology Delhi, New Delhi, India
- 12.15 *FB-2.2:L10* **Transmission Electron Microscopy of Materials for Hydrogen Storage**
K. WANG, L.A. BENDERSKY, Materials Science and Engineering Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, USA

Sub-session FB-2.3 - Complex Hydrides

- 12.35 *FB-2.3:L09* **Synthesis and Characterisation of $\text{Ca}(\text{BH}_4)_2$ for Solid State Hydrogen Storage**
C. RONGEAT, A. BORGSCHULTE, A. ZÜTTEL, L. SCHULTZ, O. GUTFLEISCH, IFW Dresden, Institute for Metallic Materials, Dresden, Germany, and **EMPA**, Laboratory for Hydrogen and Energy, Duebendorf, Switzerland
- 12.55 *FB-2.3:L11* **Proton Vibrations in Lithium Imide Studied Through Incoherent Inelastic Neutron Scattering**
D. COLOGNESI, ISC-CNR, Sesto Fiorentino (FI), Italy; **A. PIETROPAAOLO**, Univ. Milano Bicocca, Dip.to di Fisica "G. Occhialini", Milano, Italy; **A.J. RAMIREZ-CUESTA**, STFC, Rutherford Appleton Lab., Chilton, Didcot, UK

THURSDAY JUNE 17 MORNING

Session FD-2 - Capacitive Storage

Room: **VENERE**

Chair: SU-MOON PARK, Korea

- 9.30 *FD-2:IL11* **Tailoring of Mesoporous Carbons for Advanced Electric Double Layer Capacitors**
D. JURCAKOVA, T.E. RUFFORD, Z.H. ZHU, G.Q.M. LU, University of Queensland, ARC Centre of Excellence for Functional Nanomaterials, AIBN and School of Engineering, Brisbane, QLD, Australia
- 10.05 *FD-2:IL12* **Recent Advances in Understanding the Capacitive Storage in Microporous Carbons**
P. SIMON, Université de Toulouse, CIRIMAT UMR CNRS 5085, Toulouse, France; Y. GOGOTSI, Drexel University, Dept. of Materials Science and Engineering, Philadelphia, USA
- 10.40 *Break*

Session FD-3 - Application Engineering

Room: **VENERE**

Chair: R. SIMON, France

- 11.10 *FD-3:IL01* **Electrochemical Storage for Multi-source Hybrid Renewable Energy Systems**
V. ANTONUCCI, M. FERRARO, G. NAPOLI, N. BRIGUGLIO, G. BRUNACCINI, F. SERGI, CNR, Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano", Messina, Italy; G. GRADITI, ENEA - Centro Ricerche Portici, Napoli, Italy
- 11.45 *FD-3:IL02* **Energy Conservation and Management Strategies for Commercial Li-ion Batteries in Telecommunication Applications**
T. TSUJIKAWA, K. YABUTA, T. MATSUSHITA, NTT Facilities, Inc., Tokyo, Japan; M. ARAKAWA, NTT Facilities Research Institute Inc., Tokyo, Japan; K. HAYASHI, Shin-Kobe Electric Machinery Co., Ltd., Saitama, Japan
- 12.20 *FD-3:IL03* **Real-Time Impedance Monitoring of Electrode/Electrolyte Interfaces**
SU-MOON PARK, JUNG-SUK YOO, BYOUNG-YONG CHANG, School of Energy Engineering, Ulsan National Institute of Science and Technology, Ulsan, Korea

THURSDAY JUNE 17 MORNING

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

Room: URANO

Chair: H. BÖTTNER, Germany

- 8.45 *FE-2:IL21* **Misfit Layered Compounds - Nanocomposite Thermoelectric Materials**
D.C. JOHNSON, C. HEIDEMAN, QIYIN LIN, M. SMELLER, Dept. of Chem. and Matls Sci. Inst., University of Oregon, Eugene, OR, USA
- 9.15 *FE-2:IL22* **Recent Advances in In₂O₃ Based Thermoelectrics**
E. GUILMEAU, T. ZHOU, S. BHAME, A. MAIGNAN, B. RAVEAU, Laboratoire CRISMAT, UMR 6508 CNRS-ENSICAEN, Caen, France
- 9.45 *FE-2:L23* **Thermoelectric Generating Properties of Perovskite Like Materials**
H. KOHRI, Kogakuin University, Hachioji, Tokyo, Japan; M. KATO, I.J. OHSUGI, I. SHIOTA, Salesian Polytechnic, Machida, Tokyo, Japan
- 10.05 *FE-2:L24* **Thermoelectric Properties of Spark Plasma Sintered (SPS) Fully Dense Silicon Carbide Nanoensembles**
D.M. GRUEN, P. BRUNO, Materials Science Division, Argonne National Laboratory; J. ROUTBORT, D. SINGH, Energy System Division, Argonne National Laboratory, Argonne, IL, USA
- 10.25 *FE-2:L25* **Enhanced Thermoelectric Performance of Carbon Nanotube/Polyaniline Composites**
QIN YAO, LIDONG CHEN, WENQING ZHANG, SHENGCONG LIUFU, XIHONG CHEN, ZHENGLIANG SUN, Shanghai Institute of Ceramics, Chinese Academy of Science, Shanghai, China

10.45 *Break*

Chair: J. TOBOLA, Poland

- 11.15 *FE-2:IL26* **High Figure of Merit Superlattice Thermoelectric Materials and Devices**
R. VENKATASUBRAMANIAN, G. BULMAN, P. BARLETTA, J. STUART, T. COLPITTS, RTI International, Research Triangle Park, NC, USA
- 11.45 *FE-2:IL27* **Rapid Solidification Methods for Fabrication of Novel Thermoelectric Materials**
XINFENG TANG¹, HAN LI¹, WENJIE XIE^{1,3}, YONGGAO YAN¹, QINGJIE ZHANG¹, C. UHER², T.M. TRITT³, ¹State Key Lab. of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, P.R. China; ²Dept. of Physics, University of Michigan, Ann Arbor, MI, USA; ³Dept. of Physics and Astronomy, Clemson University, Clemson, SC, USA
- 12.15 *FE-2:L28* **Thermal Expansion and Mechanical Properties of Skutterudites**
G. ROGL^{1,2,3,4}, L. ZHANG^{1,2,4}, P. ROGL¹, A. GRYTSIV¹, D. RAJS², M. KRIEGISCH², H. MÜLLER², E. BAUER², S. PUCHEGGER³, J. KOPPENSTEINER³, W. SCHRANZ³, M. ZEHETBAUER⁴, ¹Institute of Physical Chemistry; ²Institute of Solid State Physics; ³Nonlinear Physics Group; ⁴Group Physics of Nanostructured Materials; University of Vienna, Wien, Austria
- 12.35 *FE-2:L30* **Low-temperature Properties of Layered g-CaxCoO₂ Compound**
JINFENG LIU, XIANGYANG HUANG, LIDONG CHEN, Shanghai Institute of Ceramics, CAS, Shanghai, China

THURSDAY JUNE 17 MORNING

Session FG-3 - Emerging and New Generation Solar Cells

Room: LE PLEIADI

Chair: F. ROCA, Italy

- 8.50 *FG-3:IL06* **Development of Film-type Bifacial Dye-sensitized Solar Cells**
T. MIYASAKA, Toin University of Yokohama, Graduate School of Engineering, Kanagawa, Japan
- 9.20 *FG-3:IL07* **Mesoscopic Charge Transport in Dye-sensitized Solar Cells**
QING WANG, J.R. JENNINGS, G.W. YANG, Dept. of Materials Science and Engineering, National University of Singapore, Singapore
- 9.50 *FG-3:IL08* **Tandem and Hybrid Structure for High Efficiency Dye-sensitized Solar Cells**
S. HAYASE, Graduate School of Life Science and Systems Eng., Kyushu Institute of Technology, Hitakyushu, Japan
- 10.20 *FG-3:L09* **Near-IR Sensitization of Nanocrystalline TiO₂ with New Ruthenium Complexes**
H. SUGIHARA, T. FUNAKI, N. ONOZAWA-KOMATSUZAKI, K. KASUGA, Y. KAWANISHI, K. SAYAMA, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan
- 10.40 *FG-3:L10* **DSSC Counterelectrodes Based on Nanocarbons**
S. GAGLIARDI, L. GIORGI, R. GIORGI, N. LISI, TH. DIKONIMOS MAKRIS, E. SALERNITANO, ENEA, C.R. Casaccia, Rome, Italy; E. DELL'ORTO, Material Science Dept., University Milano-Bicocca, Italy
- 11.00 *Break*

Chair: S. HAYASE, Japan

- 11.30 *FG-3:IL11* **Italian Road Map for Emerging and Next Generation PV**
F. ROCA, ENEA Portici Research Centre, Portici (NA), Italy
- 12.00 *FG-3:L12* **Active Materials Based on Implanted Si for Obtaining Intermediate Band Solar Cells**
K. SANCHEZ, I. AGUILERA, P. PALACIOS, **P. WAHNON**, Instituto de Energia Solar & Dpt. Tecnologias Especiales Aplicadas a la Telecomunicacion, Universidad Politecnica de Madrid, Madrid, Spain
- 12.20 *FG-3:L13* **Single-phase Intermediate Band Materials for PV Cells: Quantum Calculation Assessment and Experimental Realisation**
R. LUCENA, D. GAMARRA, **J.C. CONESA**, Inst. de Catálisis y Petroleoquímica, CSIC, Madrid, Spain; P. PALACIOS, I. AGUILERA, Y. SEMINOVSKI, P. WAHNON, Inst. de Energía Solar, Universidad Politécnica de Madrid, Spain
- 12.40 *FG-3:L15* **Electrical Transport Mechanism for Silicon Quantum-dots Based Solar Cells**
M. MORGANO, A. SCACCABAROZZI, S. BINETTI, M. ACCIARRI, Dip. di Scienza dei Materiali, Università degli Studi Milano-Bicocca, Milano, Italy; ZHIZHONG YUAN, L. PAVESI, Lab. Nanoscienze, Dip. di Fisica, Università di Trento, Povo (Trento), Italy; G. PUCKER, Micro-technologies Lab., Fondazione Bruno Kessler, Povo (Trento), Italy

THURSDAY JUNE 17 MORNING

Session FH-4 - Heat Thermal Fluids and Thermal Energy Storage

Room: ORSA MINORE

Chair: R. PITZ-PAAL, Germany

- 9.00 *FH-4:IL01* **Molten Salt Heat Transfer Fluids and Thermal Storage Technology**
N. SIEGEL, Sandia National Laboratories, Albuquerque, NM, USA
- 9.30 *FH-4:IL02* **PCM-Graphite Latent Heat Storage Systems for Industrial Process Heat Recovery**
R. SCHMITT, O. OETTINGER, T. GRUENBERGER, SGL CARBON GmbH, Meitingen, Germany; W.-D. STEINMANN, R. TAMME, Institute of Technical Thermodynamics, Stuttgart, Germany
- 10.00 *FH-4:IL03* **New Methods to Characterize Phase Change Materials**
E. PALOMO DEL BARRIO, TREFLE - Site ENSAM, Talence, France
- 10.30 *FH-4:L04* **Solar-thermal Energy Conversion and Storage: Conductive Heat Transfer Using Bulk Graphite for a Domestic System**
C.C. SORRELL, T.C. PALMER, L.J. BOWEN, A. NAKARUK, School of Materials Science and Engineering, University of New South Wales, Sydney, NSW, Australia
- 10.50 *FH-4:L05* **Overview of PCMs for Concentrated Solar Power in the Temperature Range 200 to 350 °C**
T. BAUER, D. LAING, R. TAMME, Institute of Technical Thermodynamics, German Aerospace Center (DLR), Stuttgart, Germany
- 11.10 *Break*

Session FH-3 - CSP Concentrators and Heat Collection Elements

Room: ORSA MINORE

Chair: V.D. RUMYANTSEV, Russia

- 11.40 *FH-3:IL01* **Materials and Design Requirements for Advanced Concentrators**
R. PITZ-PAAL, DLR, Institute of Technical Thermodynamics, Cologne, Germany
- 12.10 *FH-3:IL07* **High Temperature Stable Selective Absorber Coating for Receiver Tube**
K. SILMY, T. KUCKELKORN, J. SCHULTE-FISCHEDICK, SCHOTT Solar CSP GmbH, Bavaria, Germany

Session FI-2 - Materials Design and Device Development

Room: SIRIO

Chair: Y. SHIGESATO, Japan

- 8.40 *FI-2:IL21 Chromogenics for Sustainable Energy*
C.G. GRANQVIST, Uppsala University, The Angstrom Laboratory, Uppsala, Sweden
- 9.10 *FI-2:IL22 Pathways Towards p-type Oxide Layers for Opto-electronic Applications*
B. SZYSZKA¹, C. POLENZKY¹, P. LOEBMANN², S. GOETZENDORFER², C. ELSAESSER³, W. KOERNER³, ¹Fraunhofer Inst. for Surface Eng. and Thin Films IST, Braunschweig, Germany; ²Fraunhofer Inst. for Silicate Research ISC, Wuerzburg, Germany; ³Fraunhofer Inst. for Mechanics of Materials IWM, Freiburg, Germany
- 9.40 *FI-2:L23 Au-based Transparent Conductors for Window Applications: Effect of Substrate Material and Temperature*
P.C. LANSAKER, G.A. NIKLASSON, C.G. GRANQVIST, Dept. of Eng. Sci., The Angstrom Lab., Uppsala University, Uppsala, Sweden
- 10.00 *FI-2:L24 Fabrication of (001)-oriented Anatase Ti1-xNbxO2 Films on Glass Substrate with Perfectly Aligned LaAlO3 Seed Layer*
Y. HIROSE, K. KIMURA, K. TAIRA, S. NAKAO, T. HASEGAWA, Univ. of Tokyo, KAST, Tokyo, Japan
- 10.20 *FI-2:L25 The Relationship of Electrical and Structural Properties of Synthetic Melanin Embedded in Matrix of Thin Films Zinc Oxide, for Their Use as Electrodes in Bio-generators*
D.C. ALTAMIRANO-JUAREZ, J.J. HERNANDEZ-BARRIGA, Univ. de la Sierra Sur, Miahuatlán, Oaxaca, México; **C. GARCÍA-PACHECO**, Inst. Tecnológico de Chetumal, Chetumal, Quintana Roo, México
- 10.40 *Break*
- Chair:* C.G. GRANQVIST, Sweden
- 11.10 *FI-2:IL26 Electronic Structures and Energy Band Lineup of Transparent Conducting Materials Studied by Photoelectron Spectroscopy*
H. YANAGI, Univ. of Yamanashi, Kofu, Japan; **K. NOMURA, H. HIRAMATSU**, JST ERATO-SORST in Tokyo Tech, Yokohama, Japan; **Y. TODA, T. KAMIYA, H. HOSONO**, Tokyo Tech, Yokohama, Japan
- 11.40 *FI-2:IL27 Thermophysical Properties of Various TCO Films; ITO, IZO, AZO and TTO Films*
Y. SHIGESATO, N. OKA, T. YAGI, N. TAKETOSHI, T. BABA, Graduate School of Science and Eng., Aoyama Gakuin University, Sagamihara, Kanagawa, Japan National Institute of Advanced Industrial Science and Technology (AIST), Japan
- 12.10 *FI-2:L28 Electrical Transport in Al Doped ZnO Grown by Reactive Pulsed Magnetron Sputtering*
S. CORNELIUS, M. VINNICHENKO, A. KOLITSCH, W. MÖLLER, Institute of Ion Beam Physics and Materials Research, Forschungszentrum Dresden-Rossendorf, Dresden, Germany
- 12.30 *FI-2:L29 Morphological Control and Photochemical Properties of Nitrogen-doped Titania Nanoparticles by Microwave-assisted Solvothermal Process*
BIN LIU, YUHUA WANG, School of Physical Science and Technology, Lanzhou University, China; **SHU YIN, TSUGIO SATO, IMRAM**, Tohoku University, Japan

THURSDAY JUNE 17 MORNING

Session FJ-2 - Electro-optical Characterisation

Room: ORSA MAGGIORE

Chair: J.W.P. HSU, USA

- 9.00 *FJ-2:IL13* **Organic Syntheses and Characteristics of Novel Conjugated Polymers for AMOLEDs**
HONGSUK SUH, YOUNGEUP JIN, SUHEE SONG, Dept. of Chemistry & Chemistry Inst. for Functional Materials, Pusan National University, Busan, Korea; SUN HEE KIM, SUNG HEUM PARK, KWANGHEE LEE, Dept. of Material Science and Eng., Gwangju Institute of Science and Technology, Korea
- 9.30 *FJ-2:IL14* **Real Time Optical Monitoring of Growth and Processing of Materials for LEDs**
M. LOSURDO, G. BRUNO, CNR-IMIP, Bari, Italy
- 10.00 *FJ-2:IL15* **VUV Optical Properties of III-Nitrides in the Thin Film Limit**
C. COBET, M. RÖPPISCHER, N. ESSER, Institute for Analytical Sciences, Berlin, Germany; R. GOLDHAHN, G. ROSSBACH, C. BUCHHEIM, Institute of Physics, TU Ilmenau, Ilmenau, Germany
- 10.30 *Break*

Session FJ-3 - Device Structures and Manufacturing

Room: ORSA MAGGIORE

Chair: F.H. TEHERANI, France

- 11.00 *FJ-3:IL01* **White OLEDs for Lighting**
H. BOERNER, Philips Research Europe Laboratories, Aachen, Germany
- 11.30 *FJ-3:IL02* **Opto-electronic Grade Zinc Oxide for Device Applications**
D.J. ROGERS, Ferechteh Hosseini Teherani Nanovation, Orsay, France
- 12.00 *FJ-3:IL03* **Light Sources for General Lighting**
K. STREUBEL, Osram GmbH, Munich, Germany

**Session FM-5 - Cloaking and Transformation Optics
with Metamaterials**

Room: GIOVE

Chair: V.M. SHALAEV, USA

- 9.00 *FM-5:IL01* **New Concepts of Microwave and Optical Cloaking**
S. TRETYAKOV, Helsinki University of Technology, Espoo, Finland
- 9.30 *FM-5:IL02* **Elastodynamic Metamaterials**
M. BRIANE, IRMAR and INSA de Rennes, France; F. GUEVARA VASQUEZ, G.W. MILTON, D. ONOFREI, University of Utah, Salt Lake City, UT, USA; J. WILLIS, Cambridge University, UK
- 10.00 *FM-5:IL03* **Selected Applications of Transformation Electromagnetics**
I. GALLINA, G. CASTALDI, V. GALDI, University of Sannio, Benevento, Italy; A. ALU', University of Texas, Austin, TX, USA; N. ENGHETA, University of Pennsylvania, Philadelphia, PA, USA
- 10.30 *FM-5:IL04* **Applications of Metamaterial Cloaking**
F. BILOTTI, S. TRICARICO, L. VEGNI, University "Roma Tre", Dept. of Applied Electronics, Rome, Italy
- 10.50 *Break*

Chair: S. TRETYAKOV, Finland

- 11.20 *FM-5:IL05* **Anisotropic Metamaterials Emulated by Tapered Waveguides**
I.I. SMOLYANINOV, BAE Systems, Columbia, MD, USA
- 11.50 *FM-5:IL06* **Transforming Light with Metamaterials**
V.M. SHALAEV, A.V. KILDISHEV, S. XIAO, V.P. DRACHEV, A. BOLTASSEVA, School of Electrical and Computer Engineering and Birck Nanotechnology Center, Purdue University, West Lafayette, IN, USA
- 12.20 *FM-5:IL07* **Non-Euclidean Transformation Optics**
U. LEONHARDT, University of St Andrews, St Andrews, UK; A. DANNER, Singapore National University, Singapore

Session FF-6 - Radiation Effects

Room: **SMERALDO 1**

Chair: Y. NAGAI, Japan

- 9.00 *FF-6:IL02* **Radiation-induced Segregation in Austenitic and Ferritic-martensitic Steels**
G.S. WAS, J.P. WHARRY, University of Michigan, Ann Arbor, MI, USA; B. WIRTH, University of California, Berkeley, CA, USA
- 9.30 *FF-6:IL03* **Direct In-situ Electron Microscope Observations of Dynamics of Radiation Defects in Irradiated Materials**
K. ARAKAWA, H. MORI, Research Center for Ultra-High Voltage Electron Microscopy, Osaka University, Ibaraki, Osaka, Japan
- 10.00 *FF-6:L04* **On the Origin of Large Interstitial Clusters in Displacement Cascades in Iron**
A.F. CALDER, D.J. BACON, A.V. BARASHEV, The University of Liverpool, Liverpool, UK; Yu.N. OSETSKY, Oak Ridge National Laboratory, Oak Ridge, TN, USA
- 10.20 *Break*

Chair: G.S. WAS, USA

- 10.50 *FF-6:IL05* **Radiation Damage in Ferritic High-Cr Alloys for Nuclear Applications**
D. TEREITYEV, L. MALERBA, G. BONNY, N. CASTIN, Structural Materials Group, Nuclear Materials Science Inst., Centre d'études de l'Energie Nucléaire (SCK.CEN), Mol, Belgium; X. HE, China Inst. of Atomic Energy, Beijing, China
- 11.20 *FF-6:IL06* **Evolution of Nano-structures in Pressure Vessel Steels in the Course of Irradiation**
Y. NAGAI, T. TOYAMA, M. HASEGAWA, IMR, Tohoku University, Japan; T. OHKUBO, NIMS, Japan; A. ALMAZOUZI, E. VAN WALLE, SCK/CEN, Belgium; R. GERARD, Tractebel, Belgium
- 11.50 *FF-6:L07* **The Influence of Interaction Geometry on the Obstacle Strength of Voids and Copper Precipitates in Iron**
P. GRAMMATIKOPOULOS, D.J. BACON, University of Liverpool, Liverpool, UK; Yu.N. OSETSKY, Oak Ridge National Laboratory, Oak Ridge, TN, USA
- 12.10 *FF-6:L08* **Residual Stress Analysis of SiC/SiC Composites Following Irradiation**
T. KOYANAGI, Graduate School of Energy Science, Kyoto University, Kyoto, Japan; S. KONDO, T. HINOKI, Institute of Advanced Energy, Kyoto University, Kyoto, Japan

THURSDAY JUNE 17 MORNING

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

Room: **TURCHESE**

Chair: A. KIMURA, Japan

- 9.30 *FF-2:L08* **Thermo-mechanical and Electrical Behaviours of Ion-irradiated SiC Fibers for Nuclear Applications**
K. SHIMODA, C. COLIN, DEN/DANS/DMN/SRMA, CEA-Saclay, Gif-sur-Yvette, France
- 9.50 *FF-2:L09* **Experimental Development at a Pilot Plant Scale of a Reduced Activation Ferritic/Martensitic RAFM Steel**
A. MORÁN, J. BELZUNCE, J.M. ARTÍMEZ, Fundación ITMA Parque Empresarial Principado de Asturias, Avilés, Asturias, Spain
- 10.10 *FF-2:L10* **Corrosion Analysis of the Candidate Structural Materials for Fusion Reactor in DRAGON Series LiPb Loops and Static Capsules**
Q.Y. HUANG, Z.Q. ZHU, S. GAO, Y.P. CHEN, X.Z. LING, Y.L. CHEN, Y.C. WU, FDS Team, Institute of Plasma Physics, Chinese Academy of Science, Hefei, Anhui, China
- 10.30 *Break*

Session FF-7 - Materials Modeling and Database

Room: **TURCHESE**

Chair: F. WILLAIME, France

- 11.00 *FF-7:IL02* **Multiscale Modelling of Radiation Effects in Fusion Materials**
S.L. DUDAREV, UKAEA Culham Centre for Fusion Energy, Abingdon, Oxfordshire, UK
- 11.30 *FF-7:L05* **Multiscale Modelling of the Influence of Damage on Thermal Properties During Tensile Loading of Ceramic Matrix Composites**
J. EL YAGOUBI, J. LAMON, L.C.T.S, Pessac, France; J.C. BATSALE, TREFLE, Talence, France
- 11.50 *FF-7:L06* **From Point Defect Clusters to Threshold Displacement Energies in Iron by Ab Initio Methods**
P. OLSSON, C. DOMAIN, EDF R&D, Dept. MMC, Les Renardières, Moret sur Loing, France
- 12.10 *FF-5:IL06* **Fabrication of Fuel and Recycling of Minor Actinides in Fast Reactors**
J. SOMERS, JRC-ITU, Karlsruhe, Germany
(rescheduled time from Session FF-5 as for Author request)

**Session FF-10.3 - Waste Form Modeling, Performance
and Characterisation**

Room: **AMBRA**

Chair: M. OZAWA, Japan

- 9.00 *FF-10.3:IL05* **The GRAAL Model: a Tool for Predicting Long-term Nuclear Glass Dissolution Kinetics**
S. GIN, P. FRUGIER, Y. MINET, B. BONIN, CEA, DEN, Bagnols sur Ceze, France
- 9.30 *FF-10.3:IL06* **Characterization and Modelling of Materials for Advanced Nuclear Systems**
G.R. LUMPKIN, K.R. WHITTLE, YINGJIE ZHANG, E.R. VANCE, Australian Nuclear Science and Technology Organisation, Menai, NSW, Australia
- 10.00 *FF-10.3:IL07* **Synthesis and Hydrothermal Stability of Ce-doped Zirconolite Ceramics**
P. PÖML^{1,2}, T. GEISLER², P. SCHMID-BEURMANN², U. GOLLA-SCHINDLER², J. HEIMINK³, A. PUTNIS², ¹EC-JRC, Institut für Transurane, Karlsruhe, Germany; ²Institut für Mineralogie, Westfälische Wilhelms-Universität, Münster, Germany; ³Institut für Physikalische Chemie, Westfälische Wilhelms-Universität, Münster, Germany
- 10.20 *FF-10.3:IL10* **The Methodology of SCK.CEN to Evaluate the Long-term Performance in Geological Disposal Conditions of Immobilized High-level Radioactive Waste**
P. VAN ISEGHEM, K. LEMMENS, E. VALCKE et al, SCK.CEN, Mol, Belgium

Session FK-4 - Theory and Mechanisms

Room: **SMERALDO 2**

Chair: V.V. MOSHCHALOV, Belgium

- 8.40 *FK-4:IL01* **Energy Scale Phenomenology of Novel Superconductors**
Y.J. UEMURA, Physics Dept., Columbia University, New York, NY, USA
- 9.10 *FK-4:IL02* **Exchange-interaction Induced Pairing in Strongly Correlated Systems**
J. SPALEK, M. SMOLUCHOWSKI, Institute of Physics, Jagiellonian University, Krakow, Poland and AGH University of Science and Technology, Krakow, Poland
- 9.40 *FK-4:IL03* **Theory for Inhomogeneous Superconductors: Approach from the t-J Model**
M. OGATA, Dept. of Physics, University of Tokyo, Tokyo, Japan
- 10.10 *Break*

Session FK-7 - Power Applications

Room: **SMERALDO 2**

Chair: W. GOLDACKER, Germany

- 10.40 *FK-7:IL01* **Fault Current Limiters - Materials, Applications and Prospects**
M. NOE, Karlsruhe Institute of Technology (KIT), Institute for Technical Physics (ITeP), Eggenstein-Leopoldshafen, Germany
- 11.10 *FK-7:IL02* **High Temperature Superconducting Generators in Support of Wind Energy**
P.J. MASSON, Advanced Magnet Lab, Palm Bay, FL, USA
- 11.40 *FK-7:IL03* **Numerical Modeling of AC Losses in FCL**
F. GRILLI, Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany
- 12.10 *FK-7:IL04* **AC Loss in Coated Conductor Tapes and Coils**
E. PARDO, M. EISTERER, H.W. WEBER, Atominstitut, Vienna University of Technology, Vienna, Austria; J. SOUC, M. VOJENČIAK, F. GOMORY, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia
- 12.40 *FK-7:L05* **AC Losses in HTSC Tapes with Ferromagnetic Part**
F. GÖMÖRY¹, M. VOJENČIAK¹, S. SAFRAN^{1,2}, Ö. ÇIÇEK^{1,2}, J. SOUC¹, ¹Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia; ²Physics Dept., Ankara University, Tandogan, Ankara, Turkey

Session FL-4 - Regenerative Medicine and Tissue Engineering

Room: **SMERALDO 3**

Chair: K. YOKU, Japan

- 9.00 *FL-4:IL11* **Bone-mimetic Laminated Nano-structures for Regeneration of Skeletal Tissues**
E. JABBARI, Biomimetic Materials and Tissue Engineering Lab., Dept. of Chemical Eng., University of South Carolina, Columbia, SC, USA
- 9.30 *FL-4:IL12* **Engineered Biomimetic Nanofibers for Regenerative Medicine**
S. RAMAKRISHNA, J. REDDY VENUGOPAL, S. LIAO, National University of Singapore, Singapore
- 10.00 *FL-4:IL13* **In vivo MRI Tracking of Transplanted Stem Cells in Rat Hind Limb Ischemia**
T. YAMAOKA, C.A. AGUDERO, Y. TACHIBANA, H. IIDA, National Cardiovascular Center Research Institute, Suita, Japan
- 10.30 *Break*
- 10.45 *FL-4:IL14* **Tissue Engineering with Natural Tissue Matrices**
A. KISHIDA, S. FUNAMOTO, J. NEGISHI, Y. HASHIMOTO, K. NAM, T. KIMURA; T. FUJISATO; H. KOBAYASHI, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Chiyoda-ku, Tokyo, Japan; Osaka Institute of Technology, Osaka, Japan; Biomaterial Center, National Institute of Material Science, Tsukuba, Japan
- 11.15 *FL-4:IL15* **Biomimesis in Bone and Tendon Tissue Engineering**
V. SIKAVITSAS, J. ALVAREZ-BARRETO, R. ABOUSLEIMAN, S. VAN GORDON, R. VORONOV, W. YATES, B. LANDY, D. PAPAVALASSILOU, P. DEANGELIS, The University of Oklahoma, Norman, OK, USA
- 11.45 *Break*

Session FL-5 - New Therapeutics and Intelligent Delivery Systems

Room: **SMERALDO 3**

Chair: M. KAWASHITA, Japan

- 12.00 *FL-5:L04* **Functionalized Amphiphilic Macromolecules for Drug Delivery and Biostabilization**
S. SPARKS, S. HEHIR, K. UHRICH, Rutgers University, Dept. of Chemistry, Piscataway, NJ, USA
- 12.20 *FL-5:L05* **XPS Characterization of Iron Oxide and Gold Nanoparticles for Tumor Care**
G. SPERANZA¹, L. MINATI¹, S. TORRENTO^{1,2}, C. MIGLIARESI³, D. MANIGLIO³, L. DALBOSCO³, ¹FBK-IRST, Trento, Italy; ²Physics Dept., University of Trento, Trento, Italy; ³Material Engineering and Industrial Technologies Dept., University of Trento, Trento, Italy
- 12.40 *FL-5:L06* **Novel Silicon Based Gene Carrier Systems**
A. SOMMERWERK, G. STRUCKMEYER, J. TILLMANN, M. UHR, J. SCHÄFER, H. RICHTER, U. BAKOWSKY, University of Marburg, Pharmazeutical Technology and Biopharmazeutics, Marburg, Germany

THURSDAY JUNE 17 AFTERNOON

Sub-session FA-2.2 - Membranes for H₂ Separation and CO₂-selective Membranes

Room: ALBA 2

Chair: A. GOLDBACH, China

- 15.00 *FA-2.2:IL01* **Carbon Molecular Sieve Membranes for H₂ - CO₂ Separation**
M.-B. HÄGG, J. ARVID LIE, QIANG YU, Dep. Chem. Eng., Norwegian University of Science and Technology
- 15.30 *FA-2.2:IL02* **Synthesis and Characterization of Zeolite and Nanophase Ceramic Membranes for High Temperature Applications**
A. JULBE, A. AYRAL, V. ROUESSAC, S. ROUALDES, Institut Européen des Membranes, Université Montpellier 2, Montpellier, France
- 16.00 *FA-2.2:IL03* **Non-Pd Alloy Membranes for H₂/CO₂ Separation**
M.D. DOLAN, CSIRO Energy Technology, Brisbane, QLD, Australia
- 16.30 *FA-2.2:IL04* **First Principles Calculations of Hydrogen Diffusion in Metal Hydrides, Metal Alloys, and Amorphous Metals**
D.S. SHOLL, SHIQIANG HAO, School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, USA
- 17.00 *Break*

Sub-session FA-2.3 - High Temperature Seals

Room: ALBA 2

Chair: G. BARBIERI, Italy

- 17.30 *FA-2.3:IL01* **High Temperature Seals for Membrane Reactor Modules**
R. DONELSON, CSIRO, Melbourne, Victoria, Australia; M. DOLAN, CSIRO Pullenvale, Queensland, Australia
- 18.00 *FA-2.3:IL02* **Development of Friction Stir Welding Technology High-temperature Power Generation Applications**
K.S. WEIL, G.J. GRANT, Y. HOVANSKI, J.T. DARSELL, Pacific Northwest National Laboratory, Richland, WA, USA

THURSDAY JUNE 17 AFTERNOON

Sub-session FB-2.3 - Complex Hydrides

Room: AUDITORIUM

Chair: R. ZIDAN, USA

- 15.00 *FB-2.3:L12* **Improved Cyclability of Titanium Catalysed Multicomponent LiBH₄-LiAlH₄ System for Hydrogen Storage**
M. MEGGOUH, G.S. WALKER, D.M. GRANT, Engineering Faculty, University of Nottingham, Nottingham, UK
- 15.20 *FB-2.3:L13* **Hydrogen Storage Research Activities in ENEA**
P.P. PROSINI, P. GISLON, M. CONTE, ENEA, Rome, Italy
- 15.40 *FB-2.3:L15* **Sorption Reactions of NaBH₄-MgH₂ Composite**
D. POTTMAIER, S. GARRONI, A. CASTELLERO, M.D. BARO, M. BARICCO, Università di Torino, Turin, Italy; Universidad Autonoma de Barcelona, Barcelona, Spain
- 16.00 *FB-2.3:L16* **Ternary Phase Destabilized Complex Hydrides: LiBH₄:MgH₂:LiAlH₄**
T.E.C. PRICE, D.M. GRANT, G.S. WALKER, University of Nottingham, Division of Fuels and Power Technology, University Park, Nottingham, UK; T.C. HANSEN, Institut Laue Langevin, Grenoble, France
- 16.20 *FB-2.3:L17* **Decomposition of Ammonia borane (NH₃BH₃) at Sub-Ambient Pressures**
R. CANTELLI, P. RISPOLI, Sapienza Università di Roma, Roma, Italy; O. PALUMBO, ISC-CNR and Sapienza Università di Roma, Roma, Italy; A. PAOLONE, Lab. Regionale SuperMAT, CNR-INFN, Salerno, and Sapienza Università di Roma, Roma, Italy; T. AUTREY, PNNL, Richland, WA, USA
- 16.40 *Break*

Sub-session FB-2.2 - Metal Hydrides

Room: AUDITORIUM

Chair: R. GRIESSEN, The Netherlands

- 17.10 *FB-2.2:L12* **On the Nucleation Step in the Mg-MgH₂ Phase Transformation**
A. AURORA, M. VITTORI ANTISARI, A. MONTONE, D. MIRABILE GATTIA, F. PIERDOMINICI, ENEA, Research Centre of Casaccia, Rome, Italy
- 17.30 *FB-2.2:L13* **Ball Milling in the Mg-Ti-H System**
D.P. WESTON, G. WALKER, D. GRANT, Dept. of M3, University of Nottingham, Nottingham, UK
- 17.50 *FB-2.2:L14* **Pellets of MgH₂-based Composites as Practical Material for Solid State Hydrogen Storage**
A. KHANDELWAL, F. AGRESTI, G. CAPURSO, A. MADDALENA, G. PRINCIPI, Dip. Ingegneria Meccanica, Settore Materiali, Univ. Padova, Italy; S. LO RUSSO, Dip. Fisica and CNISM, Univ. Padova, Italy; S. GIALANELLA, Dip. Ingegneria dei Materiali e Tecnologie Industriali, Univ. Trento, Mesiano, Trento, Italy

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

Room: **VENERE**

Chair: R. STEINBERGER-WILCKENS, Germany

- 15.30 *FC-5:IL01* **Towards Industrial Production of SOFC Stacks**
M.J. JOERGENSEN, S. PRIMDAHL, Topsoe Fuel Cell A/S, Lyngby,
Denmark
- 16.00 *FC-5:L02* **Demonstration of Polymeric Electrolyte Fuel Cell
Systems for Future Power Distribution Grids**
F. SERGI, G. BRUNACCINI, G. DISPENZA, N. BRIGUGLIO, M.
FERRARO, V. ANTONUCCI; Consiglio Nazionale delle Ricerche
Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano" CNR-
ITAE, Messina, Italy
- 16.20 *FC-5:L03* **Diagnostics and Effective Stabilization of Currents
in a Fuel Cell Stack**
J. HIRSCHFELD, Forschungszentrum Jülich, IAS-1; H. LUSTFELD,
Forschungszentrum Jülich, IFF-1; M. REIBEL, Fachhochschule
Aachen; B. STEFFEN, Forschungszentrum Jülich, JSC, Jülich,
Germany
- 16.40 *FC-5:L04* **Solide Oxide Fuel Cell System for Distributed
Generation**
G. BRUNACCINI, G. DISPENZA, F. SERGI, M. FERRARO, A.S.
ARICO', V. ANTONUCCI; Consiglio Nazionale delle Ricerche Istituto
di Tecnologie Avanzate per l'Energia "Nicola Giordano" CNR-ITAE,
Messina, Italy

THURSDAY JUNE 17 AFTERNOON

Session FG-2 - Thin Film Photovoltaics

Room: LE PLEIADI

Chair: A.W. WEEBER, The Netherlands

- 15.00 *FG-2:IL13* **New Strategies for Chalcopyrites Based Solar Cells**
H.-W. SCHOCK, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany
- 15.30 *FG-2:L15* **Development of Hybrid Sputtering/Evaporation Process for Thin Film Cu(In,Ga)Se₂ Solar Cells Grown**
S. MARCHIONNA, R. MONETA, Voltasolar s.r.l, Turate (CO), Italy;
M. ACCIARRI, S. BINETTI, S. NOVAGLIA, L. MIGLIO, Material Science Dept., Milan-Bicocca University, Milan, Italy
- 15.50 *Break*

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

Room: LE PLEIADI

Chair: A. MARTI, Spain

- 16.20 *FG-4:IL04* **New Design and Integration of High Efficiency Dye Sensitized Solar Cell (DSC) Module**
Y.D. ZHANG, X.M. HUANG, D.M. LI, Y.H. LUO, **Q.B. MENG**, Renewable Energy Laboratory, Institute of Physics, Chinese Academy of Sciences, Beijing, China
- 16.50 *FG-4:IL05* **16.4% Open Aperture Module Efficiency Using Large mc-Si Metal-wrap-through Cells**
A.W. WEEBER, I.J. BENNETT, C. TJENGDRAWIRA, A.A. MEWE, M.W.P.E. LAMERS, I.G. ROMIJN, P.C. DE JONG, ECN Solar Energy, Petten, The Netherlands
- 17.20 *FG-4:L06* **Design Analysis of a-Si/c-Si HIT Solar Cell**
M. NAWAZ, S. KARAZHANOV, A. HOLT, University Graduate Centre (UNIK) and Institute for Energy Technology, Kjeller, Norway

THURSDAY JUNE 17 AFTERNOON

Session FI-2 - Materials Design and Device Development

Room: SIRIO

Chair: H. YANAGI, Japan

- 15.00 *FI-2:L30* **Development of New Oxide Semiconductors for Thin-film Transistors Using Doping Methods**
WOO-SEOK CHEONG¹, JUN-YONG BAK^{1,2}, HONG SEUNG KIM², SUNG MOOK CHUNG¹, CHI-SUN HWANG¹, ¹Transparent Display Team, ETRI, Daejeon, Korea; ²Nanosemiconductor, Korea Maritime University, Korea
- 15.20 *FI-2:IL31* **Chemical Modification of SnO₂ as an Approach to Selectivity Enhancement for Gas Sensor Materials**
M. RUMYANTSEVA, Chemistry Dept., Moscow State University; **A. GASKOV**, Chemistry Dept., Moscow State University, Moscow, Russia
- 15.50 *FI-2:L32* **Self-diffusion in TCO Materials: A Theoretical Approach**
P. ÁGOSTON, Inst. für Materialwissenschaft, TU Darmstadt, Darmstadt, Germany; **P. ERHART**, Lawrence Livermore National Lab., Livermore, CA, USA; **K. ALBE**, Inst. für Materialwissenschaft, TU Darmstadt, Darmstadt, Germany
- 16.10 *Break*

Session FI-3 - Applications

Room: SIRIO

Chair: M. VANECEK, Czech Republic

- 16.40 *FI-3:IL02* **High-performance and High-CRI OLEDs for Lighting and Their Fabrication Processes**
T. KOMODA, H. TSUJI, N. ITO, T. NISHIMORI, N. IDE, Panasonic Electric Works Co., Ltd., Kadoma, Osaka, Japan; **T. IWAKUMA**, Idemitsu Kosan Co., Ltd., Chiba, Japan; **M. YAMAMOTO**, Tazmo Co., Ltd., Okayama, Japan
- 17.10 *FI-3:L03* **Controlled Threshold Voltage Shift of ZnO Nanowire Field Effect Transistors Depending on the Diameter of Nanowire**
D.-H. PARK, K. KIM, P.C. DEBNATH, S.Y. LEE, Center for Energy Materials Research, Korea Institute of Science and Technology, Seoul, Korea
- 17.30 *FI-3:L04* **Bipolar Resistive Switching Behavior in Ti/MnO₂/Pt Structure for Nonvolatile Resistive Switching**
M.K. YANG, **JEON-KOOK LEE**, Korea Institute of Science and Technology, Seoul, Korea; **T.K. KO**, Yonsei University, Seoul, Korea

Room: GIOVE

Chair: R. MERLIN, USA

Session FM-6 - Superlenses and Near-field Imaging

- 15.30 *FM-6:IL01* **Optical Fano Resonance in Nanostructures with Broken Symmetry**
B.S. LUK'YANCHUK, T.C. CHONG, L.P. SHI, Data Storage Institute, Agency for Research, Science and Technology, Singapore
- 16.00 *FM-6:L02* **Novel Microscopy Techniques Based on Simulated Metamaterial Anisotropy**
V.N. SMOLYANINOVA, Towson University, Towson, MD, USA; I.I. SMOLYANINOV, University of Maryland, USA; A.V. KILDISHEV, V.M. SHALAEV, Purdue University, USA

Session FM-7 - Novel Concepts in Metamaterials

- 16.20 *FM-7:L05* **Laser-Induce Transfer - A Novel Approach for Fabrication of Nanoparticle Structures for Plasmonics and Metamaterial Applications**
A.I. KUZNETSOV, C. REINHARDT, W. CHENG, A.B. EVLYUKHIN, B.N. CHICHKOV, Laser Zentrum Hannover e.V., Hannover, Germany
- 16.40 *FM-7:L06* **Novel Ways to Observe the Handedness of Chiral Optical Metamaterials**
V.K. VALEV, T. VERBIEST, Molecular Electronics and Photonics, INPAC, K.U. Leuven, Leuven, Belgium; A.V. SILHANEK, W. GILLIJNS, V.V. MOSHCHALOV, Superconductivity and Magnetism & Pulsed Fields Group, INPAC, K.U. Leuven, Leuven, Belgium; N. SMISDOM, B. DE CLERCQ, M. AMELOOT, University Hasselt and Transnational University Limburg, BIOMED, Diepenbeek, Belgium

THURSDAY JUNE 17 AFTERNOON

Session FF-6 - Radiation Effects

Room: **SMERALDO 1**

Chair: L. SANNEN, Belgium

- 15.30 *FF-6:L10* **Quantitative TEM Investigations on EUROFER 97 Irradiated up to 32 dpa**
O.J. WEIB, E. GAGANIDZE, J. AKTAA, Karlsruhe Institute of Technology, Institute for Materials Research II, Eggenstein-Leopoldshafen, Germany
- 15.50 *FF-6:L11* **Microstructure Change of Ti₃(Si,Al)C₂ After Ion Irradiation**
M. LE FLEM, X.M. LIU, S. DORIOT, T. COZZIKA, J.L. BECHADE, CEA Saclay, DEN/DMN/SRMA, Gif sur Yvette, France; I. MONNET, Centre Interdisciplinaire de Recherches Ions Lasers - CIRIL, Caen, France
- 16.10 *FF-6:IL13* **The Change of Thermo-mechanical Properties Resulting from Irradiation**
J. LINKE, G. PINTSUK, M. RÖDIG, A. SCHMIDT, Forschungszentrum Jülich, Euratom Association, Jülich, Germany
- 16.40 *Break*

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

Room: **SMERALDO 1**

Chair: S.J. ZINKLE, USA

- 17.10 *FF-8:IL04* **From Model-alloys to Ferritic-Martensitic and Ferritic Oxide Dispersion Strengthened Steels: The Fusion-fission Synergies**
J.-L. BOUTARD, Materials Consultant, DEN/RB CEA/Saclay, Gif sur Yvette, France
- 17.40 *FF-8:IL05* **An Overview of Life Limiting Irradiation Damage Degradation Phenomena in Reduced Activation 9Cr Steels**
R. KURTZ¹, G.R. ODETTE², T. YAMAMOTO², D.J. EDWARDS²,
¹Pacific Northwest National Laboratory, Richland, WA, USA;
²University of California, Santa Barbara, CA, USA

**Session FK-8 - Low Power Applications and
Superconducting Electronics**

Room: **SMERALDO 2**

Chair: U. WELP, USA

- 15.30 *FK-8:IL02* **Macroscopic Quantum Tunneling and Resonant Activation in Bi-2212 Intrinsic Josephson Junctions**
S. SATO, K. INOMATA, H.B. WANG, Tohoku Univ., Sendai, Miyagi, Japan; RIKEN, Wako, Saitama, Japan; NIMS, Tsukuba, Ibaraki, Japan
- 16.00 *FK-8:IL03* **Recent Research Developments in the DC Application of MgB₂ Superconductors**
G. GRASSO, S. BRISIGOTTI, S. BERTA, A. TUMINO, D. PIETRANERA, M. PALOMBO, L. ROSTILA, R. PENCO, Columbus Superconductors SpA, Genova, Italy
- 16.30 *FK-8:IL04* **Coherent and Continuous THz Waves Generated from high T_c Superconductor Bi₂Sr₂CaCu₂O_{8+d}**
K. KADOWAKI, M. TSUJIMOTO, K. DEGUCHI, K. IVANOVIC, T. KASHIWAGI, H. MINAMI, R.A. KLEMM, M. TACHIKI, Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki, Japan

THURSDAY JUNE 17 AFTERNOON

Room: **SMERALDO 3**

Chair: A.K. DINDA, India

Session FL-2 - Enabling Tools

- 15.00 **FL-2:IL01 Sensing of Protein Adsorption by Composites Consisting of Silver Nanoparticles and Hydroxyapatite**
C. OHTSUKI, Y. ICHIKAWA, H. SHIBATA, T. TORIMOTO, ILL YONG KIM, Graduate School of Eng., Nagoya University, Nagoya, Japan
- 15.30 **FL-2:IL02 Simultaneous Deposition of Biomaterials and Cells for Regenerative Medicine**
J. MALDA¹, N.E. FEDOROVICH¹, W. SCHUURMAN^{1,2}, J. ALBLAS¹, P.R. VAN WEEREN², W.J.A. DHERT^{1,2,3}, ¹Dept. of Orthopaedics, University Medical Center Utrecht, Utrecht, The Netherlands; ²Dept. of Equine Sciences, Utrecht University, Utrecht, The Netherlands; ³Dept. of Veterinary Sciences, Utrecht University, Utrecht, The Netherlands
- 16.00 **FL-2:IL03 Antifouling Behavior of Hydrophilic Surface Designed by Polyelectrolyte Brushes**
M. KOBAYASHI, A. TAKAHARA, JST/ERATO Soft Interface Project, Kyushu University, Fukuoka, Japan
- 16.30 *Break*

Chair: C. OHTSUKI, Japan

- 16.50 **FL-2:IL04 A Window with a View: Two Photon Imaging as a Non Invasive Tool to Study Cellular Form and Function in Vivo**
M. BRONDI, S. LANDI, S. SULIS SATO, SNS; G.M. RATTO, NEST/SNS, Pisa, Italy
- 17.20 **FL-2:L06 Analysis of Receptor Conformation and its Functional Relations for Biomimetic Device**
K. TORIMITSU, Y. SHINOZAKI, N. KASAI, A. SHIMADA, K. SUMITOMO, Y. FURUKAWA, NTT Basic Research Labs, NTT Corp., JST, Atsugi, Japan
- 17.40 **FL-2:L07 Programmable Shape Shifting Polymeric Nanoparticles**
M.-P. CHIEN, M. THOMPSON, A.M. RUSH, N.C. GIANNESCHI, University of California San Diego, La Jolla, USA

Session FL-1 - Advances in Biomaterials

- 18.00 **FL-1:L33 Nonequilibrium Mechanics of Liquid Crystal Elastomers**
W.S. OATES, Florida A&M & Florida State University, Dept. of Mechanical Engineering, Tallahassee, FL, USA
- 18.20 **FL-1:L34 Transparent Nanostructure for Observing Live Cell Proliferation and Migration**
JUNGIL CHOI, SANGWON SHIN, JONGHAN SONG, SANG-SOO KANG, TAE-HYUN NAM, DONGWOO KHANG, Center for Nanomorphological Biological Energy, Gyeongsang National University, Jinju, South Korea; School of Nano and Advanced Materials Science Eng., Gyeongsang National University, Jinju, South Korea; Nanoscale device analysis center, Korea Institute of Science and Technology, Seoul, South Korea; Dept. of Anatomy & Neuro-biology, School of Medicine, Gyeongsang National University, South Korea

Session FL-3 - Medical Diagnosis Applications

Room: **TURCHESE**

Chair: J. WEGENER, Germany

- 17.25 *FL-3:L04* **Biomimetic Systems as Luminescent Nanoprobes for Medical Imaging**
A. AL-KATTAN, P. DUFOUR, C. DROUET, CIRIMAT Carnot Inst., University of Toulouse, CNRS/INPT/UPS, ENSIACET, Toulouse, France; J. DEXPERT-GHYS, CEMES 29, Toulouse, France; J. BERNAD, B. PIPY, Lab. des Macrophages Médiateurs de l'Inflammation et Interactions Cellulaires, Univ. Paul-Sabatier - EA 2405, Inst. National de la Santé et de la Recherche Médicale IFR 31, Hôpital Rangueil, Toulouse, France
- 17.45 *FL-3:L05* **NMR Study of Novel Contrast Agents for MRI Based on Mn-ferrites and Co-ferrites**
M. MARIANI, C. CORTI, L. BORDONALI, Dip. Fisica "A. Volta", Università degli Studi di Pavia, Unità CNISM, Pavia, Italy, and S3-CNR-INFM, Modena, Italy; A. LASCIALFARI, Dip. Fisica "A. Volta", Università degli Studi di Pavia, Unità CNISM, Pavia, Italy, and Dip. Scienze Molecolari Applicate ai Biosistemi, Università degli Studi di Milano, Milano, Italy, and S3-CNR-INFM, Modena, Italy; P. AROSIO, Dip. Scienze Molecolari Applicate ai Biosistemi, Università degli Studi di Milano, Milano, Italy, and S3-CNR-INFM, Modena, Italy; M.F. CASULA, Dip. Scienze Chimiche e INSTM, Università di Cagliari, Monserrato (CA), Italy; A. BONI, C. INNOCENTI, C. SANGREGORIO, Dip. Chimica e INSTM, Università degli Studi di Firenze, Sesto Fiorentino (FI), Italy
- 18.05 *FL-3:L07* **Creation of Superelastic Functional Properties in a Ti-50.7%Ni Wire for the Stapler Suturing of Blood Vessels**
I. KHMELEVSKAYA¹, M. SOUTORINE², S. PROKOSKIN¹, E. RYKLINA¹, ¹National University of Science and Technology "MISIS", Moscow, Russia; ²Endogene Pty" Ltd, Brighton, Victoria, Australia

FRIDAY JUNE 18 MORNING

Sub-session FA-1.1 - Improved or New Materials

Room: ALBA 2

Chair: M.D. DOLAN, Australia

- 9.00 *FA-1.1:IL05* **Directional Solidification by Liquid Metal Cooling Process**
J. SHEN, J. ZHANG, L.H. HONG, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China
- 9.30 *FA-1.1:IL06* **Long-term Stabilization of Creep-resistant Ferritic Steels for Highly Efficient Ultra-supercritical Power Plants**
FUJIO ABE, National Institute for Materials Science (NIMS), Tsukuba, Japan
- 10.00 *FA-1.1:IL07* **Simplified Processing of Oxide Dispersion Strengthened (ODS) Ferritic Alloys using Gas Atomized Precursor Powders**
I.E. ANDERSON^{1,2}, J.R. RIEKEN², M.J. KRAMER¹, D. SHECHTMAN², M.F. BESSER¹; ¹Division of Matls Sci. and Eng., Ames Lab. (USDOE), Ames, Iowa, USA; ²Material Sci. and Eng. Dept., Iowa State University, Ames, Iowa, USA
- 10.30 *Break*

Sub-session FA-2.2 - Membranes for H₂ Separation and CO₂-selective Membranes

Room: ALBA 2

Chair: C. POWELL, USA

- 11.00 *FA-2.2:IL05* **Ceramic Membranes in Carbon Dioxide Capture: Applications and Potentialities**
E. DRIOLI^{1,2}, A. BRUNETTI¹, G. BARBIERI¹, ¹ITM-CNR, c/o The University of Calabria, Rende (CS), Italy; ²The University of Calabria, Dept. of Chemical Engineering and Materials, Rende (CS), Italy
- 11.30 *FA-2.2:IL06* **High Temperature Polymer-based Membranes for Hydrogen Purification and Carbon Capture**
K.A. BERCHTOLD, K.W. DUDECK, R.P. SINGH, D. ORTIZ-ACOSTA, C.F. WELCH, B.M. PATTERSON, Los Alamos National Laboratory, Los Alamos, NM, USA
- 12.00 *FA-2.2:IL07* **PdCu Membranes for Hydrogen Separation: Stability and Application Ranges**
A. GOLDBACH, L.X. YUAN, H.Y. XU, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, P.R. China
- 12.30 *FA-2.2:IL08* **Computational Design of Pd-based Alloys for Membranes for Hydrogen Gas Separation**
A.J. BÖTTGER, D.E. NANU, Delft University of Technology, Materials Science and Engineering, Delft, The Netherlands

FRIDAY JUNE 18 MORNING

FB-2.6 - Other High Surface Area Adsorbents

Room: AUDITORIUM

Chair: R. CHAHINE, Canada

- 8.30 *FB-2.6:IL01* **Metal-Organic Frameworks for Hydrogen Adsorption**
HONG-CAI ZHOU, Dept. of Chemistry, Texas A&M University, College Station, TX, USA
- 9.00 *FB-2.6:IL02* **Investigating Hydrogen Storage Materials by In Situ Neutron Diffraction**
G.S. WALKER, Fuels and Power Technology Research Division, University of Nottingham, Nottingham, UK
- 9.30 *FB-2.6:IL03* **Simple and Binary Hydrogen Clathrate Hydrates: Synthesis and Microscopic Characterization Through Neutron and Raman Scattering**
M. CELLI, D. COLOGNESI, A. GIANNASI, L. ULIVI, M. ZOPPI, Istituto dei Sistemi Complessi - CNR, Sesto Fiorentino (FI), Italy
- 10.00 *FB-2.6:IL04* **Hydrogen Storage in Metal-organic Frameworks**
M. HIRSCHER, B. PANELLA, B. SCHMITZ, I. KRKLJUS, Max Planck Institute for Metals Research, Stuttgart, Germany
- 10.30 *FB-2.6:IL05* **Spillover Mechanism in Hydrogen Storage Materials**
A. STUBOS, Institute of Nuclear Technology & Radiation Protection, NCSR "Demokritos", Athens, Greece
- 11.00 *Break*

Sub-session FB-2.7 - Theoretical Modeling

Room: AUDITORIUM

Chair: M. VITTORI ANTISARI, Italy

- 11.20 *FB-2.7:IL01* **First-Principles Studies of Phase Stability and Reaction Dynamics in Complex Metal Hydrides**
MEI-YIN CHOU, School of Physics, Georgia Institute of Technology, Atlanta, GA, USA
- 11.50 *FB-2.7:IL03* **Numerical Simulation of Hydrogen Dynamics at a Mg-MgH₂ Interface**
S. GIUSEPPONI, **M. CELINO**, ENEA, C.R. Casaccia, Rome, Italy
- 12.20 *FB-2.7:L05* **Thermodynamic Database for Hydrogen Storage Materials**
M. BARICCO, M. PALUMBO, E. PINATEL, M. CORNO, P. UGLIENGO, Dipartimento di Chimica IFM and NIS, Università di Torino, Torino, Italy
- 12.40 *FB-2.7:IL02* **Computational Screening and Structural Design of Complex Hydrogen Storage Materials**
T. VEGGE¹, J.S. HUMMELSHØJ^{1,2}, J.B. MARONSSON¹, J. STEINAR G. MYRDAL^{1,2}, ¹Risø National Lab. for Sustainable Energy, Technical University of Denmark, Roskilde, Denmark; ²Center for Atomic-scale Design and Dept. of Physics, Technical University of Denmark, Lyngby, Denmark

FRIDAY JUNE 18 MORNING

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

Room: **VENERE**

Chair: N. CHRISTIANSEN, Denmark

- 9.30 *FC-1:IL12* **Materials Challenges for Intermediate and Elevated Temperature Fuel Cells**
L.C. DE JONGHE, Dept. of Materials Science and Engineering, University of California at Berkeley and Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA
- 10.00 *FC-1:IL13* **Feasibility of Liquid Fuels for SOFC with Ni-base Anode**
H. KISHIMOTO, K. YAMAJI, M.E. BRITO, T. HORITA, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; H. YOKOKAWA, AIST and Tokyo City University, Tokyo, Japan
- 10.30 *Break*

Session FC-2 - Polymer Electrolyte Fuel Cells

Room: **VENERE**

Chair: V. ANTONUCCI, Italy

- 11.00 *FC-2:IL05* **PEM Fuel Cells: Progresses and Challenges**
XIANGUO LI, Dept. of Mechanical and Mechatronics Engineering, University of Waterloo, Waterloo, ON, Canada
- 11.30 *FC-2:IL06* **Low Humidity Proton-conducting Membranes**
J. KERR, Lawrence Berkeley National Lab., Berkeley, CA, USA
- 12.00 *FC-2:IL07* **Synthesis of Novel Metallodendrimers and Their Applications**
K. YAMAMOTO, Tokyo Institute of Technology, Yokohama, Japan
- 12.30 *FC-2:L11* **Hybrid Materials for Proton Exchange Membrane Fuel Cell**
K. VALLÉ, F. RAMBAUD, F. PEREIRA, P. BELLEVILLE, CEA, DAM, Monts, France; C. LABERTY, C. SANCHEZ, Univ Paris 06, Coll France, UPMC, UMR CNRS 7574, Paris, France

FRIDAY JUNE 18 MORNING

Session FE-3 - Progress in Devices and Applications

Room: URANO

Chair: R. FUNAHASHI, Japan

- 9.00 *FE-3:IL01* **Solar Thermoelectric Generation**
R.J. RAM, R. AMATYA, Research Lab. of Electronics, Massachusetts Institute of Technology, Cambridge, MA, USA
- 9.30 *FE-3:IL02* **Thermoelectric Application for Power Generation in Japan**
T. KAJIKAWA, Shonan Institute of Technology, Fujisawa, Kanagawa, Japan
- 10.00 *FE-3:L04* **Modular Combustor-radiator for Micro-TPV System Application**
S.K. CHOU, W.M. YANG, J.LI, Dept. of Mechanical Engineering, National University of Singapore, Singapore
- 10.20 *FE-3:L05* **Vehicular Thermoelectric and Air Conditioner/Heater Development**
J. FAIRBANKS, US Dept. of Energy, Washington, DC, USA
- 10.40 *FE-1:IL01* **Thermoionic and Thermoelectric Energy Conversion**
A. SHAKOURI, Baskin School of Engineering, University of California, Santa Cruz, CA, USA
(rescheduled time as for Author request)
- 11.10 *Break*

Chair: H. LINKE, Sweden

- 11.30 *FE-3:IL06* **Micro Peltier Devices for Cooling and for Power Generation**
H. BÖTTNER, Fraunhofer-Institute Physical Measurement Techniques IPM, Dept. for Thermoelectric Systems, Freiburg, Germany
- 12.00 *FE-3:L08* **Development of Thermoelectric Modules Based on Bulk Oxide Materials**
P. MELE, K. MATSUMOTO, K. MIYAZAKI, H. YASUMUNE, M. NAGATA, Dept. of Materials Science and Engineering, Kyushu Institute of Technology (KIT), Kitakyushu, Japan and Fukuoka Industry, Science and Technology Foundation (IST), System LSI Division, Fukuoka, Japan
- 12.20 *FE-3:L09* **Design and Fabrication of Filled Skutterudite Device**
XIAOYA LI, JINGCHENG LIAO, YUNSHAN TANG, XUGUI XIA, XIANGYANG HUANG, LIDONG CHEN, Shanghai Institute of Ceramics, Chinese Academy of Science, Shanghai, China
- 12.40 *FE-3:L10* **Recovery of Waste Heat from the Exhaust of Small Automotive Engines**
K.T. WOJCIECHOWSKI, M. SCHMIDT, R. ZYBALA, J. MERKISZ, P. FUC, P. LIJEWSKI, Dept. of Inorganic Chemistry, AGH University of Science and Technology, Cracow, Poland

FRIDAY JUNE 18 MORNING

Session FG-3 - Emerging and New Generation Solar Cells

Room: LE PLEIADI

Chair: T. MIYASAKA, Japan

- 9.00 *FG-3:IL22* **Intermediate Band Solar Cells**
A. MARTI, A. LUQUE, Instituto de Energia Solar, Universidad Politecnica de Madrid, ETSI Telecomunicacion, Madrid, Spain
- 9.30 *FG-3:IL23* **Quantum Dot-sensitized Solar Cells and Ultrafast Carrier Dynamics Characterization**
T. TOYODA, QING SHEN, Dept. of Applied Physics and Chemistry, The University of Electro-Communications, Tokyo, Japan
- 10.00 *FG-3:L24* **Efficient Energy Collection for High Efficiency Low-cost Solar Cells**
T. MARKVART, Solar Energy Lab., School of Engineering Sciences, University of Southampton, Southampton, UK
- 10.20 *FG-3:L25* **Thin Film Luminescent Solar Concentrators**
S. CHANDRA¹, S.J. MCCORMACK², J. DORAN¹, A.J. CHATTEN³,
¹Dublin Energy Lab., School of Physics, Dublin Institute of Technology, Dublin, Ireland; ²School of Engineering, Trinity College Dublin, Dublin, Ireland; ³Physics Dept., Imperial College, London, UK
- 10.40 *FG-3:L26* **Indium Gallium Nitride on Silicon Solar Cell Grown by Plasma Assisted Molecular Beam Epitaxy**
LI-WEI TU, P.H. TSENG, W.C. YEN, Dept. of Physics and Center for Nano-science and Nanotechnology, National Sun Yat-Sen University, Kaohsiung, Taiwan, R.O.C.; S.W. FENG, Dept. of Applied Physics, National University of Kaohsiung, Kaohsiung, Taiwan, R.O.C.; C.W. LAN, C.H. CHEN, W.C. SUN, Photovoltaics Technology Center, Industrial Technology Research Inst., Hsin-Chu, Taiwan, R.O.C.
- 11.00 *Break*

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

Room: LE PLEIADI

Chair: N. ROMEO, Italy

- 11.30 *FG-4:IL01* **Cost-reducing Technologies for Crystalline Silicon Solar Cells and Modules**
B. SOPORI, National Renewable Energy Laboratory, Golden, CO, USA
- 12.00 *FG-4:IL02* **Recent Results of CIS-based Thin-film PV Technology Fabricated by "Sputtering and Sulfurization/Selenization"**
K. KUSHIYA, Showa Shell Sekiyu/Showa Shell Solar, Atsugi, Kanagawa, Japan
- 12.30 *FG-4:IL03* **Fabrication and Processing of Polymer and Organic Solar Cells**
H. LAURITZEN, F.C. KREBS, Riso National Laboratory for Sustainable Energy, Roskilde, Denmark

FRIDAY JUNE 18 MORNING

Session FH-4 - Heat Thermal Fluids and Thermal Energy Storage

Room: ORSA MINORE

Chair: K. SILMY, Germany

- 9.00 *FH-4:IL06* **Thermochemical Energy Storage Systems**
A. HAUER, Bavarian Center for Applied Energy Research, ZAE Bayern, Garching, Germany
- 9.30 *FH-4:IL09* **Advanced Salts Mixtures as Heat Transfer Fluids**
F. FABRIZI, P. TARQUINI, M. VIGNOLINI, ENEA CR Casaccia, Rome, Italy
- 10.00 *Break*

Session FH-5 - Application and Commercial Experience

Room: ORSA MINORE

Chair: M. MEHOS, USA

- 10.30 *FH-5:IL02* **Solar Thermochemical Production of Hydrogen and Other Fluids**
A. MEIER, Solar Technology Laboratory, Paul Scherrer Institute, Villigen PSI, Switzerland
- 11.00 *FH-5:L03* **Optical and Thermal Characterization of Solar Receivers for Parabolic Trough Collectors**
M. SANCHEZ, **E. MATEU**, Solar Thermal Energy Dept., National Renewable Energy Centre (CENER), Sarriguren (Navarra), Spain;
C. HERAS, R. ALONSO, Universidad Zaragoza, Dpto de Ingeniería Eléctrica y Comunicaciones, Zaragoza, Spain
- 11.20 *FH-5:IL05* **Building Integration Solutions for CPV**
D. CHEMISANA VILLEGAS, University of Lleida, Lleida, Spain
- 11.50 *FH-5:IL06* **On-sun Performance of Flatcon® CPV Systems**
A. GOMBERT, I. HEILE, J. WÜLLNER, T. GERSTAIER, S. VAN RIESEN, E. GERSTER, M. RÖTTGER, Concentrix Solar GmbH, Freiburg, Germany

Session FI-3 - Applications

Room: SIRIO

Chair: H. TAKASHIMA, Japan

- 8.30 *FI-3:IL05 Plasma Enhanced Deposition of Metal Oxide Films for Photovoltaics*
M.C.M. VAN DE SANDEN, Eindhoven University of Technology, Dept. of Applied Physics, Eindhoven, The Netherlands
- 9.00 *FI-3:IL06 Application of ZnO-based Transparent Electrodes to TFT-LCDs as Substitution for ITO*
T. YAMAMOTO, T. YAMADA, H. MAKINO, N. YAMAMOTO, Materials Design Center, Kochi University of Technology, Kamishi, Japan; Y. HIRASHIMA, H. IWAOKA, T. ITOH, A. UJIHARA, R&D Center, Geomatec Co., Ltd.; H. HOKARI, M. YOSHIDA, H. MORITA, Hachioji R&D Center, Casio Computer Co., Ltd., Japan
- 9.30 *FI-3:L07 Nanostructured Metal Oxides as Cathode Interfacial Layers for Hybrid-polymer Electronic Devices*
M. VASILOPOULOU¹, L.C. PALILIS¹, D.G. GEORGIADOU¹, P. ARGITIS¹, I. KOSTIS^{2,3}, G. PAPADIMITROPOULOS¹, N.A. STATHOPOULOS², A. ILIADIS^{3,4}, **N. KONOFAOS**³, D. DAVAZOGLU¹, ¹Institute of Microelectronics, NCSR Demokritos, Aghia Paraskevi, Greece; ²Dept. of Electronics, Technological and Educational Institute of Piraeus, Aegaleo, Greece; ³Dept. of Information and Communication Systems Eng., University of the Aegean, Karlovassi, Greece; ⁴ECE Dept., University of Maryland, College Park, USA
- 9.50 *FI-3:L08 Photocatalytic Active Monoclinic WO₃ Thin Films*
M. JOHANSSON, G. NIKLASSON, L. ÖSTERLUND, Dept. of Engineering Science, The Ångström Laboratory, Uppsala University, Uppsala, Sweden
- 10.10 *FI-3:L09 Surface Modification of ITO by Al₂O₃ for Electrodes in Polymer Based OLEDs*
A. WACHAU, T. BAYER, C. KÖRBER, A. KLEIN, Darmstadt University of Technology, Inst. of Materials Science, Surface Science Division, Darmstadt, Germany; K. STEGMAIER, C. MELZER, H. VON SEGGERN, Darmstadt University of Technology, Institute of Materials Science, Electronic Materials, Darmstadt, Germany; N. VILBRANDT, M. REHAN, Darmstadt University of Technology, Ernst-Berl-Institute für Technische und Makromolekulare Chemie, Darmstadt, Germany
- 10.30 Break

Session FI-3 - Applications

Room: SIRIO

Chair: D.S. GINLEY, USA

- 11.00 *FI-3:IL10* **3-Dimensional Nanostructured ZnO for Highly Efficient Thin Film Silicon Solar Cells**
M. VANECEK, A. PORUBA, Z. REMES, J. HOLOVSKY, A. PURKRT, O. BABCHENKO, K. HRUSKA, N. NEYKOVA, Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic; J. MEIER, U. KROLL, Oerlikon Solar-Lab SA, Neuchâtel, Switzerland
- 11.30 *FI-3:IL11* **Low Voltage Driving Transparent Electroluminescence Devices Composed of Perovskite Oxides**
H. TAKASHIMA, NeRI, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan
- 12.00 *FI-3:IL12* **Recent Developments on Inorganic Electrochromic Systems**
A. ROUGIER¹, DAE HOON PARK², K. SAUVET^{1,3}, L. SAUQUES³, G. CAMPET², ¹Lab. de Réactivité et Chimie des Solides, UMR 6007, Amiens, France; ²Inst. Chimie de la Matière Condensée de Bordeaux, UPR 9048, Pessac, France; ³Délégation Générale de l'Armement, CEP, LOT A d'Arceuil, Arceuil, France
- 12.30 *FI-3:IL13* **Optimisation of Thermo-chromic Thin Films on Glass; Design of Intelligent Windows**
R. BINIONS¹, M. SAELI², I.P. PARKIN¹, ¹University College London, Dept. of Chemistry, Christopher Ingold Labs, London, UK; ²Università degli Studi di Palermo, Dip. di Progetto e Costruzione Edilizia (DPCE), Palermo, Italy

FRIDAY JUNE 18 MORNING

Session FJ-3 - Device Structures and Manufacturing

Room: ORSA MAGGIORE

Chair: K. STREUBEL, Germany

- 8.45 *FJ-3:IL04* **Nanostructured (In,Ga)N LEDs for Solid-State Lighting: Opportunities and Obstacles**
T.D. SANDS^{1,2,3}, I.H. WILDESON^{1,3}, D.A. EWOLDT^{2,3}, R. COLBY^{2,3}, ZHIWEN LIANG², D.N. ZAKHAROV³, R.E. GARCIA², E.A. STACH^{2,3},
¹School of Electrical and Computer Engineering, ²School of Materials Engineering, ³Birck Nanotechnology Center, Purdue University, West Lafayette, IN, USA
- 9.15 *FJ-3:IL05* **ZnO Devices Fabrication Using Pulse Laser Deposition**
F.H. TEHERANI, D.J. ROGERS, Nanovation, Orsay, France
- 9.45 *FJ-3:IL06* **Blue and White Phosphorescent Organic Light Emitting Devices**
JIANGENG XUE, Dept. of Materials Science and Engineering, University of Florida, Gainesville, FL, USA
- 10.15 *Break*

Chair: H. BOERNER, Germany

- 10.45 *FJ-3:IL07* **White Light Generation Using Microcavity Blue Phosphorescent OLEDs with Down-conversion Phosphors**
F. SO, University of Florida, Dept. Matls Science and Eng., Gainesville, FL, USA
- 11.15 *FJ-3:IL08* **Surface Polarity Effects in the Optical and Electronic Properties of ZnO**
M.W. ALLEN, S.M. DURBIN, Dept. of Electrical and Computer Engineering, University of Canterbury, Christchurch, New Zealand
- 11.45 *FJ-3:IL09* **Organic-inorganic Hybrid Field-effect Transistors**
T. ANTHOPOULOS, Dept. of Physics, Imperial College London, Blackett Laboratory, London, UK
- 12.15 *FJ-3:IL10* **Organic Light Emitting Devices (OLEDs): Device Physics and Architectures for Application in Solid-State Lighting**
M. SHTEIN, University of Michigan, Ann Arbor, MI, USA

FRIDAY JUNE 18 MORNING

Session FM-6 - Superlenses and Near-field Imaging

Room: GIOVE

Chair: A. BOLTASSEVA, USA

- 9.00 *FM-6:IL03* **Metamaterials, High-frequency Magnetism and the Landau-Lifshitz Permeability Argument**
R. MERLIN, University of Michigan, Dept. of Physics, Ann Arbor, MI, USA
- 9.30 *FM-6:IL04* **Manipulation of Near Fields by Means of Metamaterials**
P.A. BELOV¹, **G. PALIKARAS**¹, **M.G. SILVEIRINHA**², **YAN ZHAO**¹, **R. DUBROVKA**¹, **C.R. SIMOVSKI**³, **YANG HAO**¹, **C. PARINI**¹, ¹Queen Mary University of London, London, UK; ²University of Coimbra, Portugal; ³Helsinki University of Technology, Finland
- 10.00 *FM-6:IL05* **Superresolution Through Superoscillations**
E.T.F. ROGERS, T.S. KAO, University of Southampton, Southampton, UK; **J. BAUMGARTL**, **M. MAZILU**, **S. KOSMEIER**, **K. DHOLAKIA**, University of St Andrews, St Andrews, UK; **N.I. ZHELUDEV**, University of Southampton, Southampton, UK
- 10.30 *Break*

Session FM-7 - Novel Concepts in Metamaterials

Room: GIOVE

Chair: N. ZHELUDEV, UK

- 11.00 *FM-7:IL02* **Electromagnetic Metamaterials and Computational Electro-magnetics**
TIE JUN CUI, State Key Laboratory of Millimeter Waves, School of Information Science and Eng., Southeast University, Nanjing, P.R. China
- 11.30 *FM-7:IL03* **Magnetophotonic Crystals**
F.P. VINOGRADOV, Institute for Theoretical and Applied Electromagnetics, RAS, Moscow, Russia
- 12.00 *FM-7:IL04* **Trapped Rainbow Storage of Light in Metamaterials**
O. HESS, **K. TSAKMAKIDIS**, Advanced Technology Institute and Dept. of Physics, FEPS, University of Surrey, Guildford, Surrey, UK

FRIDAY JUNE 18 MORNING

Session FF-6 - Radiation Effects

Room: **SMERALDO 1**

Chair: P.M. DERLET, Switzerland

- 9.00 *FF-6:IL19* **An Atomic-based Mesoscale Model of Radiation Induced Segregation**
M. NASTAR, DEN/DMN/SRMP, CEA Saclay, Gif-sur-Yvette, France
- 9.30 *FF-6:L20* **Non-equilibrium Thermodynamics of Irradiated Alloy Fuels**
A. EL-AZAB, Dept. of Scientific Computing & Materials Science Program, Florida State University, Tallahassee, FL, USA; S. DUBEY, Dept. of Scientific Computing, Florida State University, Tallahassee, FL, USA; D. WOLF, Fuel Properties and Modeling, Idaho National Laboratory, Idaho Falls, ID, USA
- 9.50 *FF-6:L21* **Microchemical Evolution Under Irradiation of Fe Dilute Alloys Representative of RPV Steels by Atomic Kinetic Monte Carlo**
R. NGAYAM-HAPPY^{1,2}, C.S. BECQUART², C. DOMAIN¹, ¹EDF-R&D, Dép. MMC, Moret sur Loing, France; ²Lab. de Métallurgie Physique et Génie des Matériaux, UMR 8517, Université de Lille 1, ENSCL, Villeneuve d'Ascq, France
- 10.10 *FF-6:L23* **Nucleation Free Energy of Copper-vacancy Clusters in bcc-Fe: An Atomistic Study**
M. POSSELT, Forschungszentrum Dresden-Rossendorf, Inst. of Ion Beam Physics and Matls Res., Dresden, Germany; A.T. ALMOTASEM, M. TALATI, F. BERGNER, U. BIRKENHEUER, Forschungszentrum Dresden-Rossendorf, Inst. of Safety Research, Germany
- 10.30 *Break*

Chair: Hua-Tay LIN, USA

- 11.00 *FF-2:IL06* **Development of Low Activation Vanadium-based Alloys for Nuclear Fusion Applications**
T. MUROGA, National Institute for Fusion Science, Oroshi, Toki, Gifu, Japan
(rescheduled time from Session FF-2 as for Author request)
- 11.30 *FF-6:IL14* **Irradiation-induced Nanoscale Self-organization: Simulations, Experiments, and Application to Radiation-resistance**
P. BELLON, R.S. AVERBACK, S.W. CHEE, A. DAMODARAN, N. VO, B. STUMPHY, Dept. of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA
- 12.00 *FF-6:L16* **SANS Investigation of Phase Precipitation in HT-9 at High Neutron Irradiation Dose Levels**
J. VAN DEN BOSCH, P. HOSEMANN, T. ROMERO, R.P. HJELM, S.A. MALOY, Los Alamos National Laboratory, Los Alamos, NM, USA
- 12.20 *FF-6:IL18* **Interaction of Twin Boundaries with Radiation Damage in hcp Metals**
A. SERRA, D.J. BACON, Dept. of Applied Mathematics III, Technical University of Catalonia, Barcelona, Spain; Dept. of Engineering, The University of Liverpool, Liverpool, UK

FRIDAY JUNE 18 MORNING

Session FF-7 - Materials Modeling and Database

Room: **TURCHESE**

Chair: M. RUBEL, Sweden

- 9.00 **FF-7:IL08 Experiments and Modelling for Evaluation of Neutron Irradiation Embrittlement of Reactor Pressure Vessel Steels in Fission Reactors**
N. SONEDA, K. DOHI, K. NISHIDA, A. NOMOTO, Central Research Institute of Electric Power Industry, Komae, Tokyo, Japan
- 9.30 **FF-7:IL09 Multi-scale Modeling of Irradiation Effects on Nuclear Fuel Microstructure**
D. WOLF, Idaho National Laboratory, Idaho Falls, ID, USA
- 10.00 **FF-7:IL10 Demented Rabbits, or the Complexity and Stability of Materials Under Extreme Irradiation Environments**
P.M. DERLET, S.L. DUDAREV, Condensed Matter Theory Group, Paul Scherrer Institute, PSI-Villigen, Switzerland; Culham Centre for Fusion Energy, Abingdon, Oxfordshire, UK
- 10.30 **FF-7:IL11 Defect Clusters and Helium-vacancy Clusters in Iron and Other bcc Metals from First Principles**
F. WILLAIME, CHU CHUN FU, M.-C. MARINICA, L. VENDELON, Service de Recherches de Métallurgie Physique, CEA, Gif-sur-Yvette, France

FRIDAY JUNE 18 MORNING

Session FF-10.4 - Design and Operation of Waste Immobilisation Facilities

Room: **AMBRA**

Chair: G.M. LUMPKIN, Australia

- 9.00 *FF-10.4:IL01* **Commercial-scale Immobilization of Nuclear Waste via Cold Crucible Melter**
C. VEYER, SGN, Saint Quentin en Yvelines, France
- 9.30 *FF-10.4:IL03* **Studies on Helium Accumulation, Behaviour and Release from Nuclear Spent Fuel and Waste Forms**
T. WISS, J-P. HIernaUT, E. MAUGERI, V.V. RONDINELLA, H. THIELE, J-Y. COLLE, R.J.M. KONINGS, European Commission, Joint Research Centre, Institute for Transuranium Elements, Karlsruhe, Germany
- 10.00 *FF-10.4:IL04* **Using the Vitrification Test Rig for process Improvements on the Waste Vitrification Plants**
R. SHORT, N. GRIBBLE, E. TURNER, National Nuclear Laboratory, Sellafield, Seascale, Cumbria, UK; A. RILEY, Sellafield Ltd, Sellafield, Seascale, Cumbria, UK
- 10.30 *FF-10.4:IL05* **Cold Crucible Inductive Melting Technology - Application to Vitrification and Ceramization of High Level and Actinide Wastes**
S.V. STEFANOVSKY, SIA Radon, Moscow, Russia
- 11.00 *Break*

Session FF-10.5 - Repository Design and Requirements

Room: **AMBRA**

Chair: K. FOX, USA

- 11.30 *FF-10.5:IL02* **Lessons Learned from the Yucca Mountain and WIPP Projects**
E.J. BONANO, D.S. KESSEL, Sandia National Labs, Albuquerque, NM, USA
- 12.00 *FF-10.5:IL03* **Uncertainty in Radionuclide Retention Processes for Crystalline Rock Repository Far-field**
G. BUCKAU, Karlsruhe Institute of Technology, Institute for Radioactive Waste Management, Eggenstein-Leopoldshafen, Germany

FRIDAY JUNE 18 MORNING

Session FK-7 - Power Applications

Room: **SMERALDO 2**

Chair: D. GUBSER, USA

- 9.00 *FK-7:IL06* **High Current Low AC Loss HTS-ROEBEL-Cables for Energy Devices**
W. GOLDACKER, S. TERZIEVA, A. DRECHSLER, A. KUDYMOW, R. HELLER, R. NAST, F. GRILLI, Karlsruhe Institute of Technology, Institute for Technical Physics, Eggenstein-Leopoldshafen, Germany
- 9.30 *FK-7:IL07* **HTS Materials for Magnets in High-radiation Environments**
R. GUPTA, G. GREENE, W. SAMPSON, Brookhaven National Laboratory, Upton, NY, USA
- 10.00 *FK-7:IL08* **Seawater Magneto-hydrodynamics Power Generator / Hydrogen Generator**
M. TAKEDA, Kobe University, Kobe, Hyogo, Japan
- 10.30 *FK-7:IL09* **Failure Mechanisms in YBCO Coated Conductors**
J. SCHWARTZ, Dept. of Materials Science & Eng., North Carolina State University, Raleigh, NC, USA
- 11.00 *Break*

Session FK-8 - Low Power Applications and Superconducting Electronics

Room: **SMERALDO 2**

Chair: A. RIGAMONTI, Italy

- 11.30 *FK-8:IL05* **Terahertz Radiation from Intrinsic Josephson Junctions**
U. WELP¹, A.E. KOSHELEV¹, M. TACHIKI², K. KADOWAKI³, T. YAMAMOTO³, H. MINAMI³, H. YAMAGUCHI³, K.E. GRAY¹, W.-K. KWOK¹, ¹Materials Science Division, Argonne National Laboratory, Argonne, IL, USA; ²Graduate School of Frontier Sciences, University of Tokyo, Kashiwa, Japan; ³Institute of Materials Science, University of Tsukuba, Ibaraki, Japan
- 12.00 *FK-8:IL06* **Theory on THz Radiation of Intrinsic Josephson Junctions of Cuprate Superconductor**
SHI-ZENG LIN, **XIAO HU**, World Premier International Center for Materials Nanoarchitectonics, National Institute for Materials Science, Tsukuba, Japan

FRIDAY JUNE 18 MORNING

Session FL-5 - New Therapeutics and Intelligent Delivery Systems

Room: **SMERALDO 3**

Chair: K. UHRICH, USA

- 9.15 *FL-5:IL02* **Development of Ceramic Beads for Cancer Treatment**
M. KAWASHITA, Z. LI, N. MATSUI, Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan
- 9.45 *FL-5:IL03* **Theranostics for Molecular Imaging and Drug Delivery**
ICK CHAN KWON, Biomedical Research Center, Korea Institute of Science and Technology, Seoul, Korea
- 10.15 *FL-5:L03b* **The Use of HA Ceramic Delivery System to Stimulate Osteogenic Mediators in a Femoral Defect Rat Model**
H.A. BENGHUZZI, M. TUCCI, University of Mississippi Medical Center, Jackson, MS, USA
- 10.35 *Break*

Session FL-6 - Progress in Implant Prostheses

Room: **SMERALDO 3**

Chair: J.A. JANSEN, The Netherlands

- 11.05 *FL-6:IL02* **A Critical Assessment of the Clinical Efficacy and Cellular Response to Low Intensity Pulsed Ultrasound for Fracture Repair**
C.T. LAURENCIN, Y. KHAN, Dept. of Orthopaedic Surgery, University of Connecticut Health Center, Farmington, CT, USA
- 11.35 *FL-6:IL03* **Surface Modification of Titanium-based Implants**
D. SCHARNWEBER, Max Bergmann Center of Biomaterials; B. SCHWENZER, General Biochemistry; both TU Dresden, Dresden, Germany
- 12.05 *FL-6:IL04* **Sol-gel Derived Titania Coatings for Enhanced Bone and Soft Tissue Attachment on Titanium Implants**
T.O. NÄRHI, Dept. of Prosthetic Dentistry, Institute of Dentistry, University of Turku, Turku, Finland

POSTER PRESENTATIONS

POSTER DISCUSSION

THURSDAY JUNE 17: 18.30 - 20.00

Posters desmounting:

(after the Poster Discussion Session or on June 18 morning)

SYMPOSIUM FA

ADVANCED FOSSIL FUEL ENERGY TECHNOLOGIES: THE MATERIALS DEMAND

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

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

FA:P03 Hydrogen Uptake and Hydrogen Profiles in Chromia Scales Formed in High and Low pO₂ Test Gases at 1000 °C
L. GARCIA-FRESNILLO, S.L. TOBING, M. HÄNSEL, V. SHEMET, U. BREUER, L. SINGHEISER, W.J. QUADAKKERS, Forschungszentrum Jülich, IEF-2, Jülich, Germany

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

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

FA:HP10 Refractoriness, Microstructures and High Temperature Oxidation of TaC-reinforced Iron-based Alloys Protected by Chromium-rich Coatings

G. MICHEL, P. BERTHOD, M. VILASI, P. STEINMETZ, Institut Jean Lamour, Department 2, Faculty of Science and Techniques, Nancy-University, Vandoeuvre-les-Nancy, France

SYMPOSIUM FB

MATERIALS AND PROCESS INNOVATIONS IN HYDROGEN PRODUCTION AND STORAGE

FB:P01 Preparation of Metal Ion Doped Titanate Nanotube Thin Film for Hydrogen Production

H.J. OH¹, N.H. LEE¹, X. MA¹, J.S. HWANG², W.J. LEE³, S.J. KIM¹, ¹Faculty of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, Korea; ²Dept. of Electrical Engineering, Jeonnam Provincial College, Jeonnam, Korea; ³Korea Electrotechnology Research Institute, Changwon, Gyeongnam, Korea

FB:P02 Photo-electrochemical Characterization of a Miniature PEC Cell with Non-immersion Type TiO₂ Photoanodes

EUI-CHOL SHIN, YONG KIM, HYUN-HO SEO, JONG-SOOK LEE, JONG-HO KIM, DONG-RYUN CHO, Chonnam National University, Gwangju, Korea; EUN-YOUNG JUN, KYUNG-SIK OH, TAE-JOO CHUNG, Andong National University, Andong, Korea; M. LERCH, Technical University of Berlin, Berlin, Germany

FB:P05 The Rate Determining Steps of Catalyzed Mg on Hydrogen Absorption and Desorption Reactions

T. KIMURA¹, M. TSUBOTA², S. ISOBE², S. HINO², T. ICHIKAWA^{1,2}, Y. KOJIMA^{1,2}, ¹Graduate School of Advanced Sciences of Matter, Hiroshima University, Higashi-Hiroshima, Japan; ²Institute for Advanced Materials Research, Hiroshima University, Higashi-Hiroshima, Japan

FB:P07 Metal Hydride-based Composite Materials with Improved Thermal Conductivity and Dimensional Stability Properties

M. PENTIMALLI, F. PADELLA, ENEA, Casaccia Research Centre, Santa Maria di Galeria, Rome, Italy; E. IMPERI, Labor s.r.l., Rome, Italy; A. FRENI, CNR, ITAE, Messina, Italy

FB:P09 Solid State NMR Investigation of LiAl(NH₂)₄ on Thermal Decomposition

T. ONO, K. SHIMODA, M. TSUBOTA, T. ICHIKAWA, Y. KOJIMA, Institute for Advanced Materials Research, Hiroshima University, Higashi-Hiroshima, Japan

FB:P11 Preparation of Modified Carbon Nanostructures for Hydrogen Sorption Studies

D. MIRABILE GATTIA, M. VITTORI ANTISARI, R. MARAZZI, A. MONTONE, E. PISCOPIELLO, C. MINGAZZINI, ENEA, Research Centre of Casaccia, Rome, Italy

FB:P12 Hydrogen Storage on Beryllium-Coated Toroidal Carbon Nanostructure C₁₂₀ modeled with Density Functional Theory

F. DE L. CASTILLO-ALVARADO¹, J. ORTÍZ-LÓPEZ¹, J.S. ARELLANO², A. CRUZ-TORRES¹, ¹Escuela Superior de Física y Matemáticas, Instituto Politécnico Nacional, D.F., México; ²Universidad Autónoma Metropolitana Azcapotzalco, Dpto de Ciencias Básicas, D.F., México

FB:P17 Innovative Systems for Hydrogen Storage

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

FB:HP18 Fabrication of Thin and Thick Films of Photocatalytic Titania
A. NAKARUK, H.Z. ABDULLAH, D.A. HANAOR, C.C. SORRELL, University of New South Wales, School of Materials Sci. & Eng., Sydney, Australia

FB:HP19 Lithium Fast-Ionic Conduction in Lithium Borohydride and its Derivatives

M. MATSUO, S. ORIMO, Institute for Materials Research, Tohoku University, Sendai, Japan

FB:HP20 Nanonickel Catalyst for Kinetic Destabilization of LiAlH₄ (lithium alanate) for Facile Discharge of Hydrogen

Z.S. WRONSKI, T. CZUJKO, Natural Resources Canada, Ottawa, Canada

FB:HP21 The Catalytic Effect of Simple Hydrides on the Production of H₂ from CH₄ and H₂O

S. SWINNEN, VINH SON NGUYEN, MINH THO NGUYEN, Kuleuven, Heverlee, Belgium

SYMPOSIUM FC

FUEL CELLS: MATERIALS AND TECHNOLOGY CHALLENGES

FC:P06 Exploitation of the Conductivity Anisotropy in Polycrystalline Apatite-type Solid Electrolytes Lanthanum Silicates

YONG KIM, EUI-CHOL SHIN, JIN-SUP IM, JAEKOOK KIM, JONG-SOOK LEE, Chonnam National University, Gwangju, Korea; DONG-IK KIM, Korea Institute of Science and Technology, Seoul, Korea

FC:P08 SrCo_{0.8}Fe_{0.2}O_{3-δ} and Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-δ} Cathodes for LSGM Based SOFCs

Y. EKINCI, N. SOLAK, Istanbul Technical University, Turkey; O. KARAKOC, R. DEMIRYUREK, C. ONCEL, M.A. GULGUN, Sabanci University, Turkey

FC:P10 High Temperature-FTIR Characterization of Gadolinia Doped Ceria

A. ARABACI, Istanbul University, Dept. of Metallurgical and Materials Engineering, Avcilar, Istanbul, Turkey; N. SOLAK, Istanbul Technical University, Dept. of Metallurgical and Materials Engineering, Istanbul, Turkey

FC:P11 Electrically Conductive CNT/PTFE Composite Film for Corrosion Resistant Coating on Bipolar Plate of Polymer Exchange Membrane Fuel Cells

Y. SHOW, Tokai University, Hiratsuka, Kanagawa, Japan

FC:P12 Low Pt Content Catalyst for PEM Fuel Cells Based on Water Insoluble Salts of Heteropolyacids

S. DSOKE, P. MERINO, R. MARASSI, Dept. of Chemistry, University of Camerino, Camerino (MC), Italy; B. SCROSATI, Dept. of Chemistry, University of Rome "La Sapienza", Rome, Italy; P.J. KULESZA, A. KOLARY, A. ZUROWSKI, Dept. of Chemistry, University of Warsaw, Warsaw, Poland

FC:P13 Sulfonation of Polyaniline to be Used in Proton Exchange Membrane Fuel Cells

A.P. SANTIAGO DE FALCO, M.S. PINHO, Brazilian Navy Research Institute (IPqM), Ilha do Governador, Rio de Janeiro, RJ, Brazil; L.C. MENDES, Macromolecules Institute Prof. Eloisa Mano, Federal University of Rio de Janeiro (IMA/UFRJ), RJ, Brazil

FC:P15 Electrochemical Degradation of Gas Diffusion Layers in PEM Fuel Cells

M.J. RENNESON, J. PROOST, Université Catholique de Louvain, Division of Materials and Process Engineering, Louvain-la-Neuve, Belgium; W. FREDRIKSSON, M. ODGAARD, K. EDSTRÖM, Uppsala University, Dept. of Materials Chemistry, Uppsala, Sweden

FC:P16 **Synthesis of Pt-Mo-N Films and Their Catalytic Activity**

A. MIURA, J.M. GREGOIRE, M.E. TAGUE, R. BRUCE VAN DOVER, H.D. ABRUNA, F.J. DISALVO, Cornell University, Ithaca, NY, USA

FC:HP17 **Microstructural Engineering of Apatite Membranes to Enhance Proton Conductivity**

M. YATES, DONGXIA LIU, XUE WEI, K. SAVINO, Dept. of Chemical Engineering, University of Rochester, Rochester, NY, USA

FC:HP18 **A Novel Anode Based on Ni-Doped Perovskite for Direct Alcohol Solid Oxide Fuel Cells**

G. MONFORTE, M. LO FARO, A. STASSI, M. MINUTOLI, V. ANTONUCCI, A.S. ARICÒ, CNR-ITAE Institute, Messina, Italy

SYMPOSIUM FD

ELECTROCHEMICAL ENERGY STORAGE SYSTEMS: THE NEXT EVOLUTION

FD:P01 **Nanostructured Anode and Cathode Materials for Li-ion Batteries**

G. FERRARA, C. ARBIZZANI, L. DAMEN, **R. INGUANTA**, S. PIAZZA, C. SUNSERI, M. MASTRAGOSTINO, Dip. di Ingegneria Chimica dei Processi e dei Materiali, Università di Palermo, Italy; Dip. di Scienza dei Metalli, Elettrochimica e Tecniche Chimiche, Università di Bologna, Bologna, Italy

FD:P02 **Validity of MgFe₂O₄ Normal Spinel as a Cathode Material for Rechargeable Battery**

S. MARUYAMA, Y. MIYAZAKI, T. KAJITANI, Dept. of Applied Physics, Graduate of Engineering, Tohoku University, Sendai, Japan

FD:P03 **A Molecular Dynamics Study on Pressure Dependence of Ag Diffusion in Ag₃Si**

M. YARIMITSU, **M. ANIYA**, Dept. of Physics, Kumamoto University, Kumamoto, Japan

FD:P04 **A Chemical Bonding Approach to Ionic Conduction and Thermal Expansion in Oxide Ion Conductors**

S. TANIGUCHI, M. ANIYA, Dept. of Physics, Kumamoto University, Kumamoto, Japan

FD:HP05 **Research and Development of Advanced Extended-life Thermal Batteries**

O. SHALEV, RAFAEL Company, Energy Sources, Haifa, Israel

SYMPOSIUM FE

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

FE:P01 **Theoretical Study and Design for High Thermoelectric Properties for Ag_xTeyTlz Compound with First Principle Band Calculation**

H. FUNASHIMA, N. HAMADA, Dept. of Physics, Tokyo University of Science, Noda, Japan

FE:P02 Preparation of Multiphase Composites Including Sr, Ti and Nb Oxides, and Their Thermoelectric Properties

K. FUDA, T. SHOJI, Dept. of Applied Chemistry for Environments, Akita Univ., Akita, Japan; S. SUGIYAMA, Akita pref. Ind. Tech. Center, Akita, Japan

FE:P03 Improved Thermoelectrics Based on Bismuth and Antimony Chalcogenides for Temperatures Below 240 K

L.N. LUKYANOVA, V.A. KUTASOV, P.P. KONSTANTINOV, V.V. POPOV, Ioffe Physical-Technical Institute of the RAS, Lab. for Physics of Thermoelements, St. Petersburg, Russian Federation

FE:P04 Characterization and Properties of Nano-crystalline Mg₂Si Prepared by the Ball Milling Process

M. IOANNOU¹, E. HATZIKRANIOTIS², K.M. PARASKEVOPOULOS², TH. KYRATSI¹, ¹Dept. of Mechanical and Manufacturing Eng., University of Cyprus, Nicosia, Cyprus; ²Dept. of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece

FE:P06 Heat Treatment on Ball-Milled K₂Bi₈Se₁₃ Thermoelectric Materials

M. IOANNOU¹, E. HATZIKRANIOTIS², K. CHRISAFIS², D.Y. CHUNG³, K.M. PARASKEVOPOULOS², TH. KYRATSI¹, ¹Dept. of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus; ²Dept. of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece; ³Materials Science Division, Argonne National Laboratory, Argonne, IL, USA

FE:P07 PbTe-Sb₂Te₃ Nanocomposites Prepared by Mechanical Alloying: Microstructure and Thermoelectric Properties

CH. PAPAGEORGIOU, J. GIAPINTZAKIS, TH. KYRATSI, Dept. of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus

FE:P08 Mg₂Si Thin Film Preparation for Thermoelectric Applications

M. ANGELAKERIS¹, E. HATZIKRANIOTIS¹, TH. KYRATSI², K.M. PARASKEVOPOULOS¹, ¹Dept. of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece; ²Dept. of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus

FE:P09 Raman Spectroscopy Study on Na₂/3Mn_{1-x}FexO₂ Oxides

M. SENDOVA-VASSILEVA¹, R. STOYANOVA^{2,3}, D. CARLIER³, M. YONCHEVA², E. ZHECHEVA², C. DELMAS³; ¹Central Lab. of Solar Energy and New Energy Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria; ²Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Sofia, Bulgaria; ³Institut de Chimie de la Matière Condensée de Bordeaux, ICMCB-CNRS and ENSCPB Université Bordeaux I, Pessac, France

FE:HP10 High-Temperature Transport Properties of Indium Filled Cobalt-antimonide Based Skutterudites Processed via Ball-Milling and Subsequent Current Assisted Short-term Sintering

A. SESSELMANN, R. HASSDORF, L. BÖTTCHER, C. STIEWE, E. MÜLLER, German Aerospace Center, Institute of Materials Research, Cologne, Germany

FE:HP11 Thermoelectric Properties of Bi-Sb 22 at% Alloy after Multiple Roll Bonding

C. FANCIULLI, M. CODECASA, S. CERESARA, CNR-IENI, Lecco, Italy

FE:HP12 Synthesis and Characterization of Thermoelectric Materials for High Temperature Applications

S. BOLDRINI, S. FIAMENI, S. BATTISTON, S. BARISON, S. FASOLIN, M. FABRIZIO, CNR - IENI, Padova, Italy

FE:HP13 Highly Scalable Nanostructured Bulk Chalcogenides with Enhanced ZT and Novel Thermoelectric Metrology using Thermal Microprobe and Transient Harman Techniques

YANLIANG ZHANG¹, E.E. CASTILLO¹, R.J. MEHTA², K. CHINNATHAMBI², G. RAMANATH², T. BORCA-TASCIUC¹, ¹Department of Mechanical, Aerospace and Nuclear Engineering; ²Department of Materials Science and Engineering, Rensselaer Polytechnic Institute, Troy, New York, USA

SYMPOSIUM FF

**MATERIALS CHALLENGES FOR FUTURE
NUCLEAR FISSION AND FUSION
TECHNOLOGIES**

***FF:P01* General Corrosion Properties of Modified PNC1520 Austenitic Stainless Steel in Supercritical Water as a Fuel Cladding Candidate Material for Supercritical Water Reactor**

Y. NAKAZONO¹, T. IWAI¹, H. ABE² (formerly ¹), ¹Nuclear Professional School, School of Engineering, the University of Tokyo, Tokai, Ibaraki, Japan; ²Material Design Division, Institute for Material Research, Tohoku University, Japan

***FF:P03* Development of Fe-base and Ni-base ODS Alloys for Advanced Nuclear Fission Application**

S. UKAI, Y. SUGINO, B. LENG, Q. TANG, S. HAYASHI, Hokkaido University, Sapporo, Japan; T. KAITO, S. OHTSUKA, Japan Atomic Energy Agency, Oarai, Japan

***FF:P06* The Influence of Helium and ODS on the Irradiation-induced Hardening of Eurofer97 at 300 °C**

C. HEINTZE¹, F. BERGNER¹, R. LINDAU², R. KOEGLER¹, ¹Forschungszentrum Dresden-Rossendorf, Dresden, Germany; ²Forschungszentrum Karlsruhe, Karlsruhe, Germany

***FF:P07* Progressive Development for Structural Integrity Quantification of Nuclear Grade Graphite in Very High Temperature Gas Cooled Reactor Core Environments**

SHUO-CHENG TSAI, JI-JUNG KAI, FU-RONG CHEN, YI-TSANG HSIEH, Center for Electron Microscopy, Dept. of Engineering and System Science, National Tsing-Hua University, HsinChu, Taiwan, R.O.C.

***FF:HP08* Some Materials Aspects of Development and Manufacturing of the Multi-Layer ITER First Wall**

A. GERVASH, I. MAZUL, Efremov Institute, Plasma Facing Materials and Components, Saint Petersburg, Russia

Focused Session FF-10

**MATERIALS TECHNOLOGY FOR
NUCLEAR WASTE TREATMENT AND
DISPOSAL**

***FF-10:P02* Synthesis and Characterization of ZrO₂ Based Pyrochlore-type Ceramics for Nuclear Waste Conditioning**

S. NEUMEIER, A.A. BUKAEMSKIY, G. MODOLO, D. BOSBACH, Forschungszentrum Jülich GmbH - IEF-6, Germany

***FF-10:P03* Conditioning of Actinides in Monazite-type Ceramics**

C. BABELOT, S. NEUMEIER, A.A. BUKAEMSKIY, G. MODOLO, D. BOSBACH, Forschungszentrum Jülich GmbH - IEF-6, Jülich, Germany

***FF-10:P06* Effect of Temperature on Glass Leach Kinetics**

ZHANG HUA, LUO SHANGGENG, China Institute of Atomic Energy, Beijing, China

***FF-10:HP07* Radiation hazard of HLW incorporated in glass**

A. OCHKIN, S. STEFANOVSKY, D. Mendeleev University of Chemical Technology of Russia, Institute of Modern Energy Materials and Nanotechnology, Moscow, Russia

***FF-10:HP08* Study of New Filter Properties for Cs-137 Vapour Capture at High Temperature**

A.S. ALOY, A.V. STRELNIKOV, RPA «V.G. Khlopin Radium Institute», St. Petersburg, Russia; S.V. STEFANOVSKY, SUE SIA "RADON", Russia

SYMPOSIUM FG

**PHOTOVOLTAIC SOLAR ENERGY
CONVERSION: MATERIALS AND
TECHNOLOGY CHALLENGES**

FG:P02 **P and Al Diffusion Process for Thin Si Wafers Studied by SEM and EDX**

E. OCHOA-MARTINEZ, A. MERCHAN, R. ROMERO, M. GABAS, L. MARTINEZ., F. MARTIN, D. LEINEN, J.R. RAMOS-BARRADO, Lab. de Materiales y Superficie, Dpto de Física Aplicada, Univ. de Málaga, Spain

FG:P05 **Quantum Size Effects in a-Si:H Films Prepared by PECVD with Different Hydrogen-diluted Silane**

L. PRUSÁKOVÁ, V. VAVRUNKOVÁ, M. NETRVALOVÁ, P. SUTTA, University of West Bohemia, New Technology Research Centre, Plzeň, Czech Republic; J. MULLEROVÁ, Dept. of Engineering Fundamentals, University of Zilina, Liptovský Mikuláš, Slovakia

FG:P06 **Adhesion and Barrier Properties Analysis of Silica-like Thin Layer on Polyethylene Naphthalate Substrates for Thin Film Solar Cells**

M.L. ADDONIZIO, **L. FUSCO**, ENEA, Portici Research Center, Portici, Napoli, Italy

FG:P07 **Local Mapping of Electrical Properties and Surface Topography of CuInS₂ Thin Films Deposited by Spray Pyrolysis on Conductive Layers**

N. KAMOUN ALLOUCHE^{1,2}, N. JEBBARI¹, **C. GUASCH**², N. KAMOUN TURKI¹, M. CASTAGNE², ¹Lab. de Physique de la Matière Condensée, Faculté des Sciences de Tunis El Manar, Tunisie; ²Inst. d'Electronique du Sud, Unité Mixte de Recherche 5214 UM2-CNRS (ST2i), Univ. Montpellier 2, Montpellier, France

FG:P12 **Investigation of Thin Film CdS/CdTe Solar Cells with Different Back Contacts**

G. KHRYPUNOV, A. MERIUTS, N. KLOCHKO, T. SHELEST, A. KHRYPUNOVA, National Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine

FG:P13 **Nanofibrous TiO₂: A new material with extraordinary properties**

M. ZUKALOVA, J. PROCHAZKA, L. KAVAN, J. Heyrovský Institute of Physical Chemistry, v.v.i. Academy of Sciences of the Czech Rep., Prague, Czech Rep.

FG:P14 **Band Structure in Amorphous Carbon Nitride Films and Its Application in Thin-Film Solar Cells**

M. AONO, N. TAMURA, Dept. of Materials Science and Eng., National Defense Academy, Kanagawa, Japan; H. HABUCHI, Dept. of Electrical and Computer Eng., Gifu National College of Technology, Gifu, Japan; N. KITAZAWA, **Y. WATANABE**, National Defense Academy, Kanagawa, Japan

FG:P15 **Electrochemical Fabrication of CIS Thin Film Solar Cell**

KYOUNGJU JANG, DAE MIN KIM, **JONG-YOUNG KIM**, HYO SIK CHANG, YOON SUK OH, Korea Inst. of Ceramic Eng. & Technology, Icheon, Korea

FG:P16 **Structural and Optical Properties of SiO_xN_y Containing Silicon Nanocrystals Fabricated by Plasma Enhanced Chemical Vapour Deposition Technique**

G. FERBLANTIER, M. CARRADA, F. DELACHAT, M. FICCADENTI, J.J. GROB, A. SLAOUI, InESS - CNRS, Strasbourg, France

FG:P17 **Comparing Organic Single-carrier-diodes to Bulk-heterojunctions Using Impedance Spectroscopy**

B. ECKER, E. VON HAUFF, J. PARISI, Energy and Semiconductor Research, University of Oldenburg, Oldenburg, Germany

FG:P23 **Polymeric Additives and Surfactants Used for the Enhancement of Sprayed 3D Solar Cells Photovoltaic Respons**

I. POPOVICI, D. PERNIU, L. ISAC, A. DUTA, Transilvania University of Brasov, Brasov, Romania

FG:P25 Surface Photovoltage Spectroscopy - A Powerful Tool for Evaluation of Electrodes Used in Dye-Sensitized Solar Cells

TAO HE, National Center for Nanoscience and Technology, Beijing, China; J.Y. ZHAO, Y.A. CAO, College of Physics, and TEDA Applied Physics School, Nankai University, Tianjin, China

FG:P27 Silicon Nanowire-based Radial p-n Junction Solar Cells

T. STELZNER, F. VOIGT, A. BERGER, D. LEROSE, V. SIVAKOV, B. HOFFMANN, S.H. CHRISTIANSEN, Institute of Photonic Technology, Jena, Germany

FG:P28 Influence of the Al-BSF in the Efficiency of a Commercial Cz-Si Solar Cell

C. VAZQUEZ¹, J. ALONSO¹, M.A. VAZQUEZ¹, L.A. CABALLERO¹, J.R. RAMOS-BARRADO², Isofoton S.A., Málaga, Spain; ²Lab. de Materiales y Superficie, Dpta. Fisica Aplicada I, Universidad de Malaga, Malaga, Spain

FG:HP29 Photocurrent Generation by Novel KrF-laser-synthesised-SWCNTs/Silicon Hybrid Planar Structures Intended for Photovoltaic Applications

M.A. EL KHAKANI¹, V. LE BORGNE¹, M. MOHAMEDI¹, F. ROSEI¹, P. CASTRUCCI², M. SCARSELLI², M. DE CRESCENZI², ¹Institut National de la Recherche Scientifique, INRS-Energie, Matériaux et Télécommunications, Varennes, Canada; ²Dip. Fisica, Università di Roma-Tor Vergata, Roma, Italy

FG:HP30 Non-radiative Energy Transfer from Nanocrystal Quantum Dots to Adjacent Nanowire Conducting Channels Based Photovoltaic Energy Conversion: A New Solar Cell Paradigm

SIYUAN LU, Z. LINGLEY, A. MADHUKAR, Department of Physics, & Mork Family Department of Chemical Engineering and Materials Sciences, University of Southern California, Los Angeles, CA, USA

FG:HP31 Tuning of Energy Levels of Organic Dyes for Dye-sensitized Solar Cells by Fluorine Group Substitution

K. IIDA, K. KOBAYASHI, K. FURUYA, AGC Seimi Chemical Co., Ltd., Kanagawa, Japan

FG:HP32 Nanowire Photodetectors and Photovoltaics

C. SOCI¹, A. ZHANG², WEI WEI³, XINYU BAO⁴, YI JING², HONGKWON KIM², YUHWANG LO², DELI WANG², ¹Nanyang Technological University, Singapore; ²University of California, San Diego, USA; ³California Institute of Technology, USA; ⁴Stanford University, USA

SYMPOSIUM FH

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

FH:P01 Improvement of Radiation Resistance of Multijunction Solar Cells by Application of Bragg Reflectors

V.M. LANTRATOV, V.V. EMELYANOV, N.A. KALYUZHNYI, S.A. MINTAIROV, M.Z. SHVARTS, Ioffe Physical Technical Institute of RAS, St.-Petersburg, Russia

FH:P02 AlGaAs/GaAs Photovoltaic Cells with InGaAs Quantum Dots

S.A. BLOKHIN, N.A. KALYUZHNYI, A.V. SAKHAROV, A.M. NADTOCHIY, A.S. PAUYSOV, M.V. MAXIMOV, N.N. LEDENTSOV, V.M. LANTRATOV, S.A. MINTAIROV, M.Z. SHVARTS, Ioffe Physical Technical Institute RAS, St.Petersburg, Russia; A.R. KOVSH, S.S. MIKHRIN, Innolume GmbH, Dortmund, Germany

FH:HP05 A CPV System Integrated into a Greenhouse Based on NIR Reflecting Lamellae: Optimizing of Optics

P.J. SONNEVELD, G.L.A.M. SWINKELS, Wageningen UR, Greenhouse Technology, Wageningen, Netherlands

SYMPOSIUM FI

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

FI:P01 Analysis on Resistive Switching of Resistive Random Access Memory using Visualization Technique of Data Storage Area with Secondary Electron Image

K. KINOSHITA, T. MAKINO, A. HANADA, K. DOBASHI, T. YODA, S. KISHIDA, Tottori University, Tottori, Japan

FI:P02 Interface Electronic Structure of Sputtering Deposited Undoped and Doped ZnO Thin Films on a Commercial Cz-Si Solar Cell Substrate

M. GABÁS¹, P. DÍAZ¹, S. BIJANI¹, S. PALANCO¹, P. HERRERO², F. AGULLÓ-RUEDA², A.R. LANDA-CÁNOVAS², J.R. RAMOS-BARRADO¹, ¹Dpto. Física Aplicada I, Lab. de Materiales y Superficies, Universidad de Málaga, Málaga, Spain; ²Inst. de Ciencia de Materiales de Madrid, CSIC, Madrid, Spain

FI:P08 Study on the Electrical, Optical and Durability Characteristics of IZO/Ag-alloy/IZO Transparent Conductive Multilayer System

S.H. CHO, WON-JONG LEE, Dept. of Materials Science and Engineering, KAIST, Taejeon, Republic of Korea

FI:P10 Sol Gel Synthesis of Doped ZnO Transparent Electrodes for PV Cells

I. WINER, G.E. SHTER, G.S. GRADER, Technion-Israel Institute of Technology, Haifa, Israel

FI:P11 Control of n-channel Depletion and Enhancement-mode ZnO Nanowire Field Effect Transistors

P.C. DEBNATH^{1, 2}, K. KIM¹, D.-H. PARK¹, S.Y. LEE¹, ¹Center for Energy Materials Research, Korea Institute of Science and Technology (KIST), Seoul, South Korea; ²University of Science and Technology (UST), South Korea

FI:P13 Potentiostatic Deposition of Zinc Oxide on Flexible Substrate

C.H. WONG, C.L. MAK, K.H. WONG, Hong Kong Polytechnic University, Kowloon, Hong Kong

FI:P15 Optical Hydrogen Response of Sputtered Pt/WO₃ Nanostructured Films - Comparative Studies on Different Transparent Substrates

M.H. YAACOB, J.Z. OU, K. KALANTAR-ZADEH, W. WLODARSKI, Sensor Technology Laboratory, School of Electrical and Computer Engineering, RMIT University, Melbourne, Australia

FI:P17 Effect of Oxygen in Aerosol Assisted CVD of TiO₂ Using Titanium Tetra-iso-propoxide/Acetylacetone Solutions

F. MAURY, F.D. DUMINICA, CIRIMAT, CNRS/INPT/UPS, ENSIACET, Toulouse, France

FI:HP18 Effects of the Deposition Parameters on the Structural Properties of Tungsten Oxide Thin Films Deposited by HFCVD for Use in Hybrid Organic/Inorganic Optoelectronic Devices

I. KOSTIS^{1, 2}, M. VASILOPOULOU³, G. PAPANIMITROPOULOS³, A.A. ILIADIS^{2, 4}, N. KONOFAS², D. DAVAZOGLU³, ¹Department of Electronics, Technological and Educational Institute of Piraeus, Aegaleo, Greece; ²Department of Information and Communication Systems Engineering, University of the Aegean, Karlovassi, Greece; ³Institute of Microelectronics, NCSR Demokritos, Terma Patriarchou Grigoriou, Aghia Paraskevi, Greece; ⁴ECE Department, University of Maryland, College Park, USA

FI:HP19 Short Channel Characteristics of Gallium-Indium-Zinc-Oxide Thin Film Transistors for Semiconductor Applications

IHUN SONG, SUNGHO PARK, SANGHUN JEON, JI-HYUN HUR, JAECHUL PARK, SUNIL KIM, SANGWOOK KIM, EUNHA LEE, CHANGJUNG KIM, U-IN JUNG, Semiconductor Device Lab, Samsung Advanced Institute of Technology, Yongin-Si, Republic of Korea

***FI:HP20* Effects of Dopants on the Structural and Opto-electrical Properties of Indium Tin Oxide Films Deposited by DC Magnetron Sputtering**

S.M. CHUNG, J.H. SHIN, W.S. CHEONG, C.S. HWANG, S.H. KO PARK, K.I. CHO, ETRI, Convergence and Components & Materials Research Division, Daejeon, Korea

SYMPOSIUM FJ

**MATERIALS AND TECHNOLOGIES FOR
SOLID STATE LIGHTING**

***FJ:P04* Tailoring Optical Properties of Blue-gap Poly(p-phenylene vinylene)s for LEDs Applications**

M.M. GIANGREGORIO, M. LOSURDO, P. CAPEZZUTO, G. BRUNO, IMIP-CNR, Bari, Italy; **A. CARDONE**, C. MARTINELLI, G.M. FARINOLA, F. BABUDRI, F. NASO, Università di Bari, Dip. di Chimica, Bari and ICCOM-CNR, Bari, Italy

***FJ:P05* Interface and Surface Modification of ZnO Induced by Hydrogen and Nitrogen and Their Impact on Light Emission Properties**

M.M. GIANGREGORIO, G.V. BIANCO, A. SACCHETTI, P. CAPEZZUTO, M. LOSURDO, G. BRUNO, IMIP-CNR, Bari, Italy

***FJ:P06* Advanced Real Time Metrology of AlGaIn/GaN and InGaIn/GaN Epitaxy**

TONG-HO KIM, A.S. BROWN, Dept. of Electrical and Computer Engineering, Duke University, Durham, NC, USA; M.M. GIANGREGORIO, M. LOSURDO, G. BRUNO, **G.V. BIANCO**, IMIP-CNR, Bari, Italy

***FJ:P07* Organic Synthesis and Characteristics of Novel Conjugated Polymers with Cyano Group and Carbazole Unit for AMOLEDs**

SUHEE SONG¹, YOUNGEUP JIN¹, SUN HEE KIM², KWANGHEE LEE², HONSGUK SUH¹, ¹Dept. of Chemistry & Chemistry Institute for Functional Materials, Pusan National University, Busan, Korea; ²Dept. of Material Science and Engineering, Gwangju Institute of Science and Technology, Korea

***FJ:P08* Dynamics of Donor Bound Excitons in Freestanding GaN Doped by Silicon and Oxygen**

G. POZINA, C. HEMMINGSSON, B. MONEMAR, Dept. of Physics, Chemistry and Biology, Linköping University, Linköping, Sweden

***FJ:P10* Synthesis, Optical and Electrical Properties of Oligo(phenylene-vinylene)s Substituted with Electron-Accepting Sulfonyl Groups**

S. GLANG, V. SCHMITT, **H. DETERT**, Institute for Organic Chemistry, Johannes Gutenberg-Universität Mainz, Mainz, Germany

***FJ:HP12* Nonpolar GaN Substrates: Optical Properties and Spatial Distribution of Extended and Point Defects**

P.P. PASKOV, B. MONEMAR, Department of Physics, Chemistry and Biology, Linköping University, Linköping, Sweden; T. PASKOVA, K.R. EVANS, Kyma Technologies Inc., NC, USA

***FJ:HP13* Novel Phases in the System Li-M-Si-N and their Photoluminescence Properties when Activated by Dopants**

J.K. BENDYNA, P.C.M.M. MAGUSIN, H.T. HINTZEN, Department of Chemical Engineering and Chemistry, Eindhoven University of Technology, Eindhoven, The Netherlands

SYMPOSIUM FM
ELECTROMAGNETIC
METAMATERIALS

FM:HP03 AFM-patterned 2-D Thin-film Polymer Photonic Crystal Analyzed by Polarimetric Scatterometry

N.C. HERR, M.A. MARCINIAK, A.G. LI, L.W. BURGGRAF, Air Force Institute of Technology, Wright-Patterson AFB, OH, USA

FM:HP04 Bandpass Filters in the TeraHertz Range Based on Al-on-Si Metamaterials

O. LIMAJ, P. CARELLI, A. DI GASPARE, A. NUCARA, M. ORTOLANI, E. PALANGE, S. LUPI, Department of Physics, University of Rome La Sapienza, Rome, Italy

FK - 6th International Conference

**SCIENCE AND ENGINEERING OF NOVEL
SUPERCONDUCTORS**

FK:P03 A Multi-band Model for $\text{LaO}_{\{1-x\}}\text{F}_{\{x\}}\text{FeAs}$

G. MURGUÍA, S. OROZCO, M.A. ORTIZ, R.M. MÉNDEZ-MORENO, P. DE LA MORA, Dpto de Física, Universidad Nacional Autónoma de México, México D.F., México

FK:P04 Grain Morphology for Ag-sheathed $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ Tapes Heat-treated in High Magnetic Fields

K. WATANABE, T. INOUE, S. AWAJI, Institute for Materials Research, Tohoku University, Sendai, Japan

FK:P06 Synthesis and Precise Analysis of $\text{Bi}_2\text{Sr}_2\text{Ca}_{n-1}\text{Cu}_n\text{O}_y$ Superconducting Whiskers

H. TANAKA¹, H. YOSHIKAWA², M. KIMURA², C. TSURUTA³, S. FUKUSHIMA², Y. MATSUI³, S. NAKAGAWA⁴, K. KINOSHITA⁴, S. KISHIDA⁴, ¹Dept. of Electrical and Computer Engineering, Yonago National College of Technology, Tottori, Japan; ²Dept. of Materials Infrastructure, National Institute for Materials Science, Hyogo, Japan; ³Advanced Nano-Characterization Center, National Institute for Materials Science, Tsukuba, Japan; ⁴Graduate School of Electrical and Electronic Eng., Tottori University, Tottori, Japan

FK:P07 Synthesis and Structural Characterization of $\text{Hg}(\text{Re})\text{-Pb-Ca-Ba-Cu-O}$ Superconducting Thin Films Grown by Spray Pyrolysis

C. MEJÍA-GARCÍA, J.L. LÓPEZ-LÓPEZ, E. DÍAZ-VALDÉS, C.V. VÁZQUEZ-VERA, Escuela Superior de Física y Matemáticas, IPN, México D.F., México

FK:P08 Processing by Pulsed Laser Deposition and Structural, Morphological and Chemical Characterization of Bi-Pb-Sr-Ca-Cu-O and $\text{Bi-Pb-Sb-Sr-Ca-Cu-O}$ Thin Films

V. RÍOS, E. DÍAZ, J.R. AGUILAR, J.I. GUZMÁN, T. KRYSHTAB, ESFM-IPN, Delegación G.A.M., México D.F., México

FK:P09 Investigation of the Switching Mechanism of Resistive Random Access Memory Utilizing High Temperature Super-conductivity as a Detector for Oxygen Vacancies

A. HANADA, K. KINOSHITA, K. MATSUBARA, K. DEGUCHI, S. KISHIDA, Tottori University, Tottori, Japan

FK:HP10 Reentrance of Macroscopic Quantum Tunneling in Cuprate Superconductors

J. MICHELSEN, V.S. SHUMEIKO, Chalmers University of Technology, Department of Microtechnology and Nanoscience, Gothenburg, Sweden

FK:HP11 Compressive Strength of Porous MgB₂ Superconductors
P. BASSANI¹, E. BASSANI¹, A. FIGINI ALBISETTI², G. RIPAMONTI², G. GIUNCHI², ¹CNR-IENI - Sezione di Lecco, Lecco, Italy; ²EDISON SpA, Divisione R&S, Milano, Italy

FL - 9th International Conference
**MEDICAL APPLICATIONS OF NOVEL
BIOMATERIALS AND NANO-
BIOTECHNOLOGY**

FL:P01 Shell Scaffolds for Bone Regeneration and Repair

D. BELLUCCI, V. CANNILLO, A. SOLA, **A. CATTINI**, Dip. di Ingegneria dei Materiali e dell'Ambiente, Univ. degli Studi di Modena e Reggio Emilia, Modena, Italy

FL:P02 New Nanostructured Chitosan Films for Reduced Bacterial Adhesion

E. DAYYOUNB, U. BAKOWSKY, Dept. of Pharmaceutical Technology and Biopharmaceutics, University of Marburg, Marburg, Germany

FL:P05 XRD Studies on Transformation of Calcium-deficient Apatite to Beta and Alfa TCP in Dynamic and Technological Conditions

B. HANDKE, A. ZIMA, Z. PASZKIEWICZ, **A. SLOSARCZYK**, AGH - University of Science and Technology, Cracow, Poland

FL:P06 Effects of Mg Additives on Properties of Mg-doped Hydroxyapatite Ceramics

A. ZIMA, A. SLOSARCZYK, **Z. PASZKIEWICZ**, M. STASZEWSKA, AGH - University of Science and Technology, Cracow, Poland; W. MRÓZ, Military University of Technology, Warsaw, Poland; A. CHROSCICKA, Medical University of Warsaw, Warsaw, Poland

FL:P10 New Corrosion-resistant Bactericidal Nitrogen-containing Steels with Increased Strength

L. KAPUTKINA, **V. PROKOSHKINA**, A. SVYAZHIN, National University of Science and Technology "MISIS", Moscow, Russia

FL:P11 Evaluation of the Apatite Coating on Silicon Nitride Based Ceramics Sintered with RE₂O₃ Additives (RE = Y, La, Yb)

J. MARCHI, CCNH, Universidade Federal do ABC, Santo André, SP, Brazil; C.C. GUEDES E SILVA, CTMSP, Centro Tecnológico da Marinha em Sao Paulo, Sao Paulo, SP, Brazil; E.C.S. RIGO, DCB, Fac. de Zootecnia e Eng. de Alimentos, Universidade de Sao Paulo, Pirassununga, SP, Brazil, A.H.A. BRESSIANI, J.C. BRESSIANI, CCTM, Instituto de Pesquisas Energéticas e Nucleares, Sao Paulo, SP, Brazil.

FL:P14 Osseointegration and Biocompatibility Study of Macroporous Biphasic Calcium Phosphate (BCP) Ceramics Obtained by Consolidation Using Albumin

C. RIBEIRO, T.S. GOIA, K.B. VIOLIN, J.C. BRESSIANI, A.H.A. BRESSIANI, Instituto de Pesquisas Energéticas e Nucleares, IPEN - CNEN/SP, Brasil

FL:P17 Disperse Materials with Adjustable Curie Temperature for Antitumor Hyperthermia

M.N. MARKELOVA, A.E. KUSHNIR, A.R. KAUL, Lomonosov Moscow State University, Moscow, Russia; V.V. DEMIDOV, V.A. ATSARKIN, Institute of Radio Eng. and Electronics, RAS, Moscow, Russia; B.M. ODINTSOV, E.J. ROY, University of Illinois at Urbana-Champaign, USA; R.I. YAKUBOVSKAYA, N.I. MOROZOVA, A.A. PANKRATOV, Moscow Hertsen Oncological Institute, RAS, Moscow, Russia

FL:P21 Fiber Optic Capillary Microfluidic Sensor for Biotechnological Applications

M. BORECKI, Warsaw Univ. of Technology, Warsaw, Poland; M.L. KORWIN-PAWLOWSKI, Université du Québec en Outaouais, Gatineau, QC, Canada; M. BEBLOWSKA, J. SZMIDT, Warsaw Univ. of Technology, Warsaw, Poland

FL:P23 Differential Cellular Responses to Superparamagnetic Iron Oxide Nanoparticles in Primary Fibroblast vs. Fibroblastic Cell Line

H.Y. KIM, S.C. HONG, J.H. LEE, J. LEE, D.-W. HAN, College of Nanoscience & Nanotechnology, Pusan National University, Busan, South Korea

FL:P25 Investigation of Affinity Interactions with Frustrated Total Internal Reflection Method

S.A. KRUTOVERTSEV, A.G. BORISOV, O.M. IVANOVA, M.V. CHUPRIN, JSC "Practic-NC", Zelenograd, Moscow, Russia; M.Yu. RUBTSOVA, Moscow State University, Moscow, Russia

FL:P26 Novel Polyphthalocyanines in Medical Diagnosis: Development of H2O2 Detection

O.M. IVANOVA, A.V. SHEVCHENKO, S.A. KRUTOVERTSEV, A.E. TARASOVA, JSC "Practic-NC", Zelenograd, Moscow, Russia; A.I. SHERLE, E.F. OLEINIK, Institute of Chemical Physics of RAS, Moscow, Russia

FL:P27 Preparation and Characterization of Poly(Vinyl Alcohol) Hydrogel Beads as an Injectable Bulking Agent

SOO JUNG CHOI, C.S. LIM, S.J. KIM, S.H. OH, J.H. LEE, Dept. of Advanced Materials, Hannam University, Daejeon, South Korea

FL:P28 In Vitro Evaluation of Pore Size Effect on Chondrogenesis of Adipose-derived Stem Cells Using Pore Size Gradient Scaffold

TAE HO KIM, S.H. OH, J.H. LEE, Dept. of Advanced Materials, Hannam University, Daejeon, South Korea

FL:P29 Hyaluronic Acid/Alginate Mixture Gel as a Tissue Adhesion Barrier

SEUNG YEON NA, S.H. OH, J.H. LEE, Dept. of Advanced Materials, Hannam University, Daejeon, South Korea; K.S. SONG, Dept. of Pathology, Chungnam National University, Daejeon, South Korea

FL:P31 Preparation of Porous Scaffold from PLGA/Hydroxyapatite Composite Coated with a Biodegradable Triblock Copolymer for Bone Tissue Engineering

M. HAGHBIN NAZARPAK, Biomaterials Research Center (BRC), University of Tehran, Tehran, Iran; F. POURASGARI, 2 Stemcells Technology, Tehran, Iran; M.N. SARBOLOUKI, Biomaterials Research Center (BRC), University of Tehran, Tehran, Iran

FL:P33 Study on Bone Cell Adaptability of TCP/HAp Functionally Graded Porous Beads for Biomaterials Application

S. OHTAKE, T. ASAOKA, Tokyo Denki University, Saitama, Japan; K. FURUKAWA, T. USHIDA, University of Tokyo, Japan; T. TATEISHI, NIMS, Japan

FL:P37 Study of Chitosan Addition in the PVP/PVAL Polymeric Blend - A System of Controlled Release of Drugs

M.C. TERENCE, L.F. DE MIRANDA, S. BRAUNSTEIN FALDINI, P.J. DE CASTRO, Universidade Presbiteriana Mackenzie - UPM, Sao Paulo-SP, Dpto de Engenharia de Materiais, Sao Paulo, SP, Brasil

FL:P38 Evaluation of the Effects of Sustained Delivery Demineralized Bone Matrix (DBM) and Osteogenic Protein-1 (OP-1) on Fracture Healing, Osteoclast Activation in a Rat Femur Model

M.A. TUCCI, S.A. WINGERTER, H.A. BENGHUZZI, University of Mississippi Medical Center, Jackson, MS, USA

FL:P39 In Vitro Study of Electrospun Nanofibrous Epigallocatechin Gallate-eluting Anti-adhesion Barrier Composed of Biodegradable Polymer

JONG HO LEE, H.Y. KIM, D.-W. HAN, College of Nanoscience & Nanotechnology, Pusan National University, Busan, South Korea; J.-C. PARK, Yonsei University College of Medicine, Seoul, South Korea; S.-H. HYON, Institute for Frontier Medical Sciences, Kyoto University, Kyoto, Japan

FL:P40 Development of Pseudoboehmites for Nanosystems to Release Acyclovir

A.H. MUNHOZ JR., S. BRAUNSTEIN FALDINI, R. RODRIGUES RIBEIRO, C. YUGI MAEDA, L.F. MIRANDA, Universidade Presbiteriana Mackenzie - UPM, Sao Paulo-SP, Brasil

FL:P42 An Efficient Low-pH Range Sensitive Artificial Muscle for Future Active Implantable Systems

B. TONDU, S. MATHÉ, N. BARDOU, University of Toulouse, Toulouse, France

FL:P43 Osseointegration of Macroporous Titanium Alloy Obtained by PM with Addition of Gelatin

T.S. GOIA, K.B. VIOLIN, M. YOSHIMOTO, J.C. BRESSIANI, A.H.A. BRESSIANI, Instituto de Pesquisas Energéticas e Nucleares, IPEN - CNEN/SP, Brasil

FL:HP44 Incorporation of Acrylate Based Spiropyran Monoliths in Micro-fluidic Devices for Photo-controlled Electroosmotic Flow

S. SCARMAGNANI, Z. WALSH, F. BENITO-LOPEZ, M. MACKA, B. PAULL, D. DIAMOND, CLARITY and ISSC, National Centre for Sensor Research, School of Chemical Sciences, Dublin City University, Dublin, Ireland

FL:HP45 Biodegradable Polymers Derived from Amino acids for Biological Applications

N. COHEN-ARAZI, J. KATZHENDLER, A.J. DOMB, Institute of Drug Research, School of Pharmacy, Faculty of Medicine, The Hebrew University of Jerusalem, Israel

FL:HP46 Specific Cell Cultivation on Nanofibrous Layer

J. MICHALEK, D. MAREKOVA, L. MARTINOVA, R. HOBZOVA, P. KOSTECKA, D. LUBASOVA, P. LESNY, M. PRADNY, P. JENDELOVA, E. SYKOVA, Institute of Macromolecular Chemistry AS CR, v.v.i., Department of Polymer Gels, Prague, Czech Republic

FL:HP47 Chitosan porous membranes as nerve guides

A. GAMBINO, A. SACCO, C. TONDA TURO, V. CHIONO, P. GENTILE, C. MATTU, G. CIARDELLI, Politecnico di Torino, Torino, Italy

FL:HP48 Synthesis of Nano-sized Hydroxyapatite Particles by Spray Pyrolysis

JUNG SANG CHO, SANG-HOON RHEE, Seoul National University, Dental Biomaterials Science, Seoul, South Korea

FL:HP49 Effect of the Initial Stability of Titanium Cylinder on Bone Regeneration

SEOK KON LEE, HYUN-MAN KIM, School of Dentistry, Seoul National University, Seoul, Korea

Social Programme

Opening Concert "Nuovo Teatro Verdi" Montecatini Terme

Monday June 14
21.30 - 23.30

The Opening Concert of the FORUM will be performed by the "Strauss Konzert Orchestra" of Sophia, Bulgarie, at the "Nuovo Teatro Verdi" of Montecatini Terme. The Orchestra is composed by about sixty players selected from the three main orchestras of the Bulgarian Capital, i.e. the Rundfunksorchester, the Staatsoper Orchestra -well known for its cooperation with Herbert Von Karajan- and the Sophia Philharmonic Orchestra.



The programme will include pieces by: J. Strauss Jr., W.A. Mozart, G. Puccini, G. Verdi. Soprano: Melissa di Biasio; Basso: Roberto Lorenzi; Tenori: Riccardo Buoncristiani e Nicola Mugnaini; Director Maestro Andrea Colombini.

Entrance ticket for non-registered companions: 25.00 EURO (subjected to place availability)

Tour to FIRENZE (FLORENCE)

THE CITY CENTER

Wednesday June 16

14.45 - 19.30

Visit to the City Center. An unrivalled itinerary of art and culture in the heart of Florence, Cathedral (Santa Maria del Fiore), with its Cupola by Brunelleschi, the Campanile (Bell Tower) by Giotto, and the Baptistery with the famous Gates of Paradise by Ghiberti and Andrea Pisano, Piazza della Signoria dominated by imposing Palazzo della Signoria flanked by the Loggia of Lanzi and the beautiful Neptune Fountain, Ponte Vecchio, the Uffizi Gallery, etc.



Meeting point: Montecatini Terme Central Railway Station (Piazza Italia) at 14.45. The participation fee for not registered companions (subjected to place availability) is 20 EURO and includes transportation, English speaking hostess and local guide. Departure from Florence: Santa Maria Novella Railway Station at about 19.00. Return to Montecatini Terme at about 20.20.

Tour to PISA

Friday June 18

14.45 - 19.30

Shown is one of the loveliest architectural complexes in the world. On a large smooth lawn stands the Cathedral, the Baptistery and the famous Leaning Tower, a unique group of buildings in an unrivaled setting, the legacy of a past age which now belongs to all mankind. Along the southern side



of the piazza lie the buildings of the old University, center of research and thought and famous for scientific disciplines.

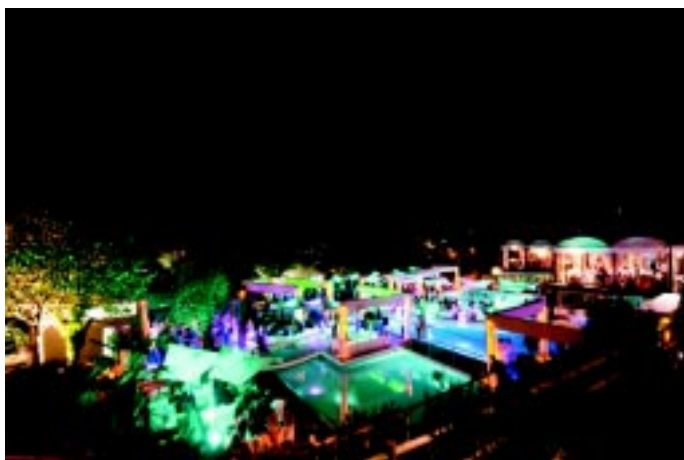
Meeting point: main entrance of the Palazzo dei Congressi at 14.45. The participation fee for not registered companions (subjected to place availability) is 25 EURO and includes transportation, English speaking hostess and local guide. Return to Montecatini Terme at about 19.30.

Conference Dinner

"Lidò Le Panteraie"

Friday June 18

21.00 - 23.30



Entrance ticket for non-registered companions: 40.00 EURO (subjected to place availability)

Optional Tours

VOLTERRA

*Monday June 14, afternoon
14.30 - 19.30*

The “magic and mysterious” city of Volterra has its roots in three thousand years of history. It is possible to find evidence and traces from every historical period which gives the city a unique aspect.

The ancient city walls, the imposing Porta all’Arco, the Necropolis of Marmini and the numerous archeological finds conserved in the Museo Etrusco Guarnacci bear testimony of the Etruscan period.

The Theatre of Vallebona survives from the period of Augustus and suggests the importance of Volterra under Roman domination.



Today the city conserves above all a Medieval aspect not only for the 12th century city walls but also because of the urban layout with narrow streets, palaces, tower houses and churches.

The Renaissance had an important influence on Volterra but without changing the city’s Medieval character. From this period are the superb palaces of Minucci Solaini, Incontri-Viti and Inghirami, which are built into the Medieval city, the imposing Fortezza Medicea and the Convent of San Girolamo.

Meeting point: entrance of the “Palazzo dei Congressi” at 14.30. Return to Montecatini Terme at about 19.30.

The participation fee (30 EURO) includes transportation, city entrance tax, English speaking hostess and local guide.

SIENA - SAN GIMIGNANO

Tuesday June 15, full day

9.00 - 19.30

Takes you through one of the most attractive landscapes of Central Italy, with wooded hills and valleys and the renowned Chianti area, famous throughout the world for its high-quality wines. Siena is a



treasure of history and art with its rich School of Sienese

Painting, its marvellous Cathedral, the Palazzo Comunale rising majestically from the lovely fan-shaped Piazza del Campo, the Tower of Mangia, San Domenico, Piazza Salimbeni, Palazzo Ghigi, Piazza del Capitano, etc. It will leave unforgettable memories.

In the afternoon, visit to S. Gimignano, a small town famous for its numerous towers. It is a real gem of Medieval architecture which takes you back to the time of great battles and romantic love stories, as described by minstrels' tales.



Meeting point: entrance of the "Palazzo dei Congressi" at 9.00. Return to Montecatini Terme at about 19.30.

The participation fee (65 EURO) includes transportation, cities entrance taxes, English speaking hostess, local guides and lunch.

FIRENZE (FLORENCE)

Wednesday June 16, full day

9.00 - 19.30

In the morning, before lunch, visit to Poggio Imperiale, Piazzale Michelangelo and San Miniato Church.

In the afternoon visit to the City Center. An unrivalled itinerary of art and culture in the heart of Florence, Cathedral (Santa Maria del Fiore), with its Cupola by Brunelleschi, the Campanile (Bell Tower) by Giotto, and the Baptistry with the famous Gates of Paradise by Ghiberti and



Andrea Pisano, Piazza della Signoria dominated by imposing Palazzo della Signoria flanked by the Loggia of Lanzi and the beautiful Neptune Fountain, Ponte Vecchio, the Uffizi Gallery, etc.



Meeting point: entrance of the "Palazzo dei Congressi" at 9.00. Return to Montecatini Terme at about 19.30.

The participation fee (60 EURO) includes transportation, city entrance tax, English speaking hostess, local guide and lunch.

THE "CINQUE TERRE"

Thursday June 17, full day

9.00 - 19.30

The Cinque Terre are one of the most uncontaminated areas in the Mediterranean Sea. Five miles of rocky coast among two promontories, thousands of kilometres of dry-laid stone walls, five small towns castled up on stone spurs in minuscule creeks. For their history and their position, the Cinque Terre have not suffered a massive expansion. The vineyards, typical of this area, have contributed to create a unique landscape with dry-laid stone walls, winding paths, enchanting beaches between cliffs and clear waters. Not only sea,

the Cinque Terre offer beautiful footpaths with take breathing view, churches, oratories and old castles, diving, food and wines of first quality. The Cinque Terre are National Park and UNESCO protected territory since 1997. Riomaggiore, Corniglia, Manarola, Vernazza,



Monterosso are the five villages that form the Cinque Terre, suspended between sea and land on sheer cliffs upon the beautiful sea.

Meeting point: entrance of the "Palazzo dei Congressi" at 9.00. Return to Montecatini Terme at about 19.30.

The participation fee (60 EURO) includes transportation, English speaking hostess and guide, and lunch.