CIMTEC 2022

Perugia, June 20-29, 2022

15th International Ceramics Congress
9th Forum on New Materials

Final Announcement

CIMTEC 2022

Flowsheet

15th INTERNATIONAL CERAMICS CONGRESS

	JUNE 20		JUNE 21		JUNE 22		JUNE 23		JUNE 24	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M	A.M.	P.M.
REGISTRATION										
SYMPOSIUM CA				CA	CA	CA	CA	CA	CA	CA
SYMPOSIUM CB					CB	CB	CB	CB		
SYMPOSIUM CC					CC	CC	CC	CC	CC	
SYMPOSIUM CD				CD	CD	CD	CD	CD	CD	
SYMPOSIUM CE				CE	CE	CE	CE	CE	CE	CE
SYMPOSIUM CF				CF	CF	CF	CF	CF	CF	
SYMPOSIUM CG				CG	CG	CG	CG	CG	CG	CG
SYMPOSIUM CH				CH	CH	CH	CH		CH	
SYMPOSIUM CI				CI	CI	CI	CI		CI	
SYMPOSIUM CJ					CJ	CJ	CJ	CJ	CJ	
SYMPOSIUM CK				CK	CK	CK	CK	CK	CK	
SYMPOSIUM CL				CL	CL	CL	CL	CL	CL	
SYMPOSIUM CM				CM		CM	CM	CM		
SYMPOSIUM CN				CN	CN	CN	CN		CN	CN
SYMPOSIUM CO							CO	CO	CO	CO
SYMPOSIUM CP				CP	CP	CP	CP		CP	CP
CONFERENCE CQ				CQ	CQ	CQ	CQ	CQ		
CONFERENCE CR				CR	CR	CR	CR	CR		
POSTER MOUNTING				◆						
POSTER DISCUSSION										◆
SOCIALS				●						●

PLENARY SESSION

● WELCOME RECEPTION ● CLOSURE DINNER

Invitation to attend

CIMTEC 2022-15th International Conference on Modern Materials and Technologies - will be held in Perugia, Italy, June 20 to 29, 2022. It will feature the 15th International Ceramics Congress (June 20-24) and the 9th Forum on New Materials (June 25-29), each of them including a number of international Symposia and Conferences. As a major longstanding event for the international materials community in 2022 celebrating its 50th Birthday, CIMTEC will gather together a large and qualified audience of materials scientists, physicists, chemists and of experts of a wide range of the most demanding application engineering areas of modern materials, from the molecular and nanoscales to large complex integrated systems.

The National Research Council of Italy (CNR), the Italian National Agency for New Technology, Energy and the Environment (ENEA) will act as major endorsers of CIMTEC 2022 together with the World Academy of Ceramics (WAC), The International Ceramic Federation (ICF) and the International Union of the Materials Research Societies (IUMRS).

The Chair, Co-Chairs and CIMTEC 2022 Committees Members invite you to foster the progress in the field by contributing with your expertise to what promises to be a very comprehensive and exciting event, and to enjoy the immense unique artistic heritage and wonderful landscape of Tuscany

Pietro Vincenzini
General Chair CIMTEC Conferences
National Research Council, Italy

Co-chairs CIMTEC 2022
Mrityunjay Singh
Ohio Aerospace Institute, USA
World Academy of Ceramics
Suk-Joong L. Kang
KAIST, South Korea
International Ceramic Federation
Robert P.H. Chang
Northwestern University, USA
International Union of Materials Research Societies

Welcome to CIMTEC 2022!

SUMMARY

15th International Ceramics Congress - Flowsheet ..... 2nd Cover
9th Forum on New Materials - Flowsheet ..... 3rd Cover

15th INTERNATIONAL CERAMICS CONGRESS

Congress Committees 2
Outline Congress 5
Sessions Timetable 6
Code Number of Contributions by Presenting Author (in alphabetical order) 10
Symposium CA Advances in Processing Science and Manufacturing of High Performance Ceramics and Composites 15
Focused Session CA-9 *Bio-inspired and Bio-enabled Processing* 17
Focused Session CA-10 *Functionally Inorganic Graded Materials* 18
Focused Session CA-11 *SHS Ceramics* 18
Focused Session CA-12 *Ceramic Joining: From Macro- to Nano-length Scales* 19
Symposium CB Big Data and Machine Learning Methods for Materials Advancements 19
Symposium CC Modelling, Simulation and Testing of Mechanical and Thermomechanical Properties of Bulk Ceramics, Coatings and Composites 20
Symposium CD High and Ultra High Temperature Ceramics and Composites for Extreme Environments 21
Symposium CE Progress in Nano-laminated Ternary Carbides, Nitrides and Borides (MAX/MAB) Phases and Derivatives Thereof (MXenes) 23
Symposium CF Advances in Functional Materials for Energy Harvesting, Storage and Solar Fuels 25
Symposium CG Ceramic Thin Films and Coatings for Protective, Tribological and Multifunctional Applications 27
Symposium CH Porous Ceramics for Environmental Protection, Energy-related Technologies and Advanced Industrial Cycles 29
Symposium CI Progress in Electroceramics Research 30
Symposium CJ Materials Demands Towards Next Generation Electrochemical Energy Storage Systems 32
Symposium CK Solid Oxide Fuel Cells: Materials and Technology Challenges 33
Symposium CL Inorganic Materials Systems for Advanced Photonics 34
Symposium CM Development and Application of Functional Transparent Conducting and Semiconducting Oxides 36
Symposium CN Geopolymers, Inorganic Polymers and Sustainable Materials 37
Symposium CO Science and Technology for Silicate Ceramics 39
Symposium CP Refractory Materials Challenges to Meet Current and Future Industry Needs 40
CQ - 9th International Conference Advanced Inorganic Fibre Composites for Structural and Thermal Management Applications 41
CR - 9th International Conference Science and Engineering of Novel Superconductors 43
Poster Presentations 44

9th FORUM ON NEW MATERIALS

Forum Committees 47
Outline Forum 50
Sessions Timetable 51
Code Number of Contributions by Presenting Author (in alphabetical order) 55
Symposium FA 3D Printing and Beyond: State-of-the-art and New Paradigms for Additive Manufacturing Technologies 60
Symposium FB Flexible and Stretchable Electronics: Materials, Devices and Applications 62
Symposium FC Research Advances on Micro/Nano Systems and their Applications 63
Symposium FD Recent Advances in Multiferroic and Magnetoelectric Materials 64
Symposium FE Functional Nanomaterials for New Generation Solid State Chemical Sensors 66
Symposium FF Electromagnetic Metamaterials and Metasurfaces: Recent Research Achievements and New Paradigms 67
Symposium FG Advances in Inorganic Luminescent Materials 68
FH - 4th International Conference Emerging Materials, Technologies and Applications for Non-volatile Memory and Memristive Devices 70
Symposium FI Graphene and Other Emerging 2D-layered Nanomaterials: Synthesis, Properties and Potential Applications 73
Symposium FJ Advanced Photocatalytic Materials for Energy and Chemistry in Transition and for the Environment 75
Symposium FK Thermoelectrics: Materials Research and Application Technologies 76
Symposium FL Stimuli Responsive and Multifunctional Polymers: Progress in Materials and Applications 78
Symposium FM State-of-the-art Research and Applications of Shape Memory Alloys 79
Symposium FN Smart and Interactive Textiles - From Nano-engineered Textile Fibres to Integrated Wearable Systems 81
Symposium FO Embodying Intelligence in Structures and Integrated Systems 82
Symposium FP Biological, Biohybrid and Bioinspired Materials: From Electronics and Photonics to Medicine 83
FQ - 13th International Conference Advanced Biomaterials and Nano-biotechnology for Medicine 84
Focused Session FQ-6 *Next Generation Implantable Neural Interfaces* 86
Focused Session FQ-7 *Wireless Body Sensor Networks for Healthcare Applications* 86
Focused Session FA-5/FQ-8 *3D Bioprinting of Soft Tissues and Organs* ..... 61 & 86
FR - 4th International Conference Materials Challenges for Sustainable Nuclear Fission and Fusion Technologies 87
Focused Session FR-10 *Materials Issues in Radioactive Nuclear Waste Treatment and Disposal* 89
Poster Presentations 90

Information to Authors & Participants 93
"HOT POSTER" Submission 95
Optional Tours 97

CONGRESS COMMITTEES

Chair

Pietro Vincenzini
National Research Council

Co-Chairs

Mrityunjay Singh
Ohio Aerospace Institute, USA
Representing World Academy of Ceramics

Suk-Joong L. Kang
KAIST, South Korea
Representing International Ceramic Federation

Advisory Boards

SYMPOSIUM CA - Advances in Processing Science and Manufacturing of High Performance Ceramics and Composites

Co-Chairs: Rajendra K. Bordia, *USA (Convener)* Gary L. Messing, *USA* Ralf Riedel, *Germany* Masahiro Yoshimura, *Taiwan* *Members:* Hiroya Abe, *Japan* Francis Cambier, *Belgium* Thierry Chartier, *France* Mari-Ann Einarsrud, *Norway* Begona Ferrari, *Spain* Olivia Graeve, *USA* Thomas Graule, *Switzerland* Olivier Guillon, *Germany* Masashi Hasegawa, *Japan* Yoshihiro Hirata, *Japan* Junichi Hojo, *Japan* Suk-Joong L. Kang, *Korea* Frank Kern, *Germany* Lisa Klein, *USA* Anne Leriche, *France* Sylvain Marinel, *France* Christophe Martin, *France* Motohide Matsuda, *Japan* Laura Montanaro, *Italy* Guenter Motz, *Germany* Makio Naito, *Japan* Eugene A. Olevsky, *USA* Willi Pabst, *Czech Republic* Wolfgang M. Sigmund, *USA* Yoshiyuki Sugahara, *Japan* Mikolaj Szafran, *Poland* Jef Vleugels, *Belgium* Zhaoju Yu, *China*

Focused Session CA-9 - Bio-inspired and Bio-enabled Processing

Convener: Masahiro Yoshimura, *Taiwan* *Members:* Joanna Aizenberg, *USA* Elisa Boanini, *Italy* Xiaodong Chen, *Singapore* Peter Fratzl, *Germany* David Kisailus, *USA* Nils Kroeger, *Germany* Jennifer Lewis, *USA* Kenneth Sandhage, *USA* Sudipta Seal, *USA*

Focused Session CA-10 - Functionally Graded Materials

Convener: Ivar E. Reimanis, *USA* *Members:* Sergey Alexandrov, *Russia* Valeria Cannillo, *Italy* Martin Friess, *Germany* Akira Kawasaki, *Japan* Sasa Novak Krmpotic, *Slovenia* Marek-Jerzy Pindera, *USA* Luis Augusto Rocha, *Brazil* Siegfried Schmauder, *Germany* Yoshimi Watanabe, *Japan* Zhangjian Zhou, *China*

Focused Session CA-11 - SHS Ceramics

Convener: Alexander S. Rogachev, *Russia* *Members:* Florence Baras, *France* Giacomo Cao, *Italy* Suren L. Kharatyan, *Armenia* Boris B. Khina, *Belarus* Evgeny Levashov, *Russia* Jerzy Lis, *Poland* Zulkhair Mansurov, *Kazakhstan* Alexander Mukasyan, *USA* Osamu Odawara, *Japan* Roberto Orrù, *Italy* Alexander E. Sytschev, *Russia*

Focused Session CA-12 - Ceramic Joining: From Macro- to Nano-length Scales

Convener: Monica Ferraris, *Italy* *Members:* Akio Hirose, *Japan* Jolanta Janczak-Rusch, *Switzerland* Wayne Kaplan, *Israel* Yutai Katoh, *USA* Kevin M. Knowles, *UK* Charles Lewinsohn, *USA* Hans-Peter Martin, *Germany* Alberto Passerone, *Italy* Noritaka Saito, *Japan*

SYMPOSIUM CB - Big Data and Machine Learning Methods for Materials Advancements

Conveners: Fadi Abdeljawad, *USA* Veena Tikare, *USA* Jingyang Wang, *China* *Members:* Wai-Yim Ching, *USA* Jui-Sheng Chou, *Taiwan* Paolo Colombo, *Italy* Masahiko Demura, *Japan* Raynald Gauvin, *Canada* Robert J. Hanisch, *USA* Satoshi Hata, *Japan* Elizabeth Holm, *USA* Surya Kalidindi, *USA* Sergei V. Kalinin, *USA* Hua-Tay Lin, *China* Bryce Meredig, *USA* Alexander Michaelis, *Germany* Tatsuki Ohji, *Japan* Ivar Reimanis, *USA* Sudipta Seal, *USA* Dileep Singh, *USA* Veera Sundararaghavan, *USA* Ichiro Takeuchi, *USA* Isao Tanaka, *Japan* Francois Willot, *France* Aron Walsh, *UK* Chris, Wolverton, *USA* Winnie WONG-NG, *USA*

SYMPOSIUM CC - Modelling, Simulation and Testing of Mechanical and Thermomechanical Properties of Bulk Ceramics, Coatings and Composites

Convener: Hua-Tay Lin, *China* *Members:* Raul Bermejo, *Austria* Giovanni Bruno, *Germany* Henry Colorado, *Columbia* Arturo Dominguez Rodriguez, *Spain* Jan Dusza, *Slovakia* Michael J. Hoffmann, *Germany* Hai-Doo Kim, *South Korea* Dietmar Koch, *Germany* Emmanuel Maillet, *USA* Yoshio Sakka, *Japan* Jonathan Salem, *USA* Junichi Tatami, *Japan* Wei-Hsing Tuan, *Taiwan* Chang-An Wang, *China* Houzheng Wu, *UK* Guo-Jun Zhang, *China*

CONGRESS COMMITTEES

SYMPOSIUM CD - High and Ultra High Temperature Ceramics and Composites for Extreme Environments

Convener: William G. Fahrenholtz, *USA* *Members:* Marianne Balat-Pichelin, *France* José Daniel Biasoli De Mello, *Brazil* Jon Binner, *UK* Robert Danzer, *Austria* Gilbert Fantozzi, *France* Stuart Hampshire, *Ireland* Hagen Klemm, *Germany* Peter Kroll, *USA* William Lee, *UK* Paul Mayrhofer, *Austria* Klaus G. Nickel, *Germany* Elizabeth J. Opila, *USA* Tatiana Prikhna, *Ukraine* Pavol Šajgalík, *Slovakia* Diletta Sciti, *Italy* Eric Wuchina, *USA* Katsumi Yoshida, *Japan*

SYMPOSIUM CE - Progress in Nano-laminated Ternary Carbides, Nitrides and Borides (MAX/MAB) Phases and Derivatives Thereof (MXenes)

Convener: Michel W. Barsoum, *USA* *Members:* Babak Anasori, *USA* Christina Birkel, *USA* Thierry Cabioc'h, *France* Jesus Gonzalez, *Germany* Qing Huang, *China* Konstantina Lambrinou, *Belgium* Shibo Li, *China* Michael Naguib, *USA* Thierry Ouisse, *France* Milan Radovic, *USA* Johanna Rosen, *Sweden* Jochen M. Schneider, *Germany* Jingyang Wang, *China* Aiguo Zhou, *China*

SYMPOSIUM CF - Advances in Functional Materials for Energy Harvesting, Storage and Solar Fuels

Convener: Sanjay Mathur, *Germany* *Members:* Ausrine Bartasyte, *France* Sven Barth, *Germany* Daniel Chua, *Singapore* Flavio De Souza, *Brazil* Mauro Epifani, *Italy* Yoon-Bong Hahn, *South Korea* Eva Hemmer, *Canada* Aivaras Kareiva, *Lithuania* Yoshitake Masuda, *Japan* Theodor Schneller, *Germany* Tohru Sekino, *Japan* Renata Solarska, *Poland* Yasuhiro Tachibana, *Australia* Leander Tapfer, *Italy* Shu Yin, *Japan*

SYMPOSIUM CG - Ceramic Thin Films and Coatings for Protective, Tribological and Multifunctional Applications

Convener: Sanjay Sampath, *USA* *Members:* Samir M. Aouadi, *USA* Christoper C. Berndt, *Australia* Michael Dugger, *USA* Per Eklund, *Sweden* Rainer Gadow, *Germany* Ashutosh Gandhi, *India* Wayne L. Gladfelter, *USA* Tanvir Hussain, *UK* Shrikant Joshi, *Sweden* Sang Sub Kim, *South Korea* Luca Lusvarghi, *Italy* Peter Mechnich, *Germany* Christian Mitterer, *Austria* Kevin Plucknett, *Canada* Kentaro Shinoda, *Japan* Dmitry V. Shtansky, *Russia* Constantin Vahlas, *France* Robert Vassen, *Germany* Sam Zhang S., *China*

SYMPOSIUM CH - Porous Ceramics for Environmental Protection, Energy-related Technologies and Advanced Industrial Cycles

Convener: Paolo Colombo, *Italy* *Members:* Lennart Bergstrom, *Sweden* Tobias Fey, *Germany* Manabu Fukushima, *Japan* Yuji Iwamoto, *Japan* Young-Wook Kim, *South Korea* Valentina Medri, *Italy* Philippe Miele, *France* Scott Misture, *USA* Rodrigo Moreno, *Spain* Kazuki Nakanishi, *Japan* Alberto Ortona, *Switzerland* Michael Scheffler, *Germany* David S. Smith, *France* Cekdar Vakifahmetoglu, *Turkey* Tim Van Gestel, *Germany* Ulrich Vogt, *Switzerland* Michaela Wilhelm, *Germany* Yuping Zeng, *China* Yu Zhou, *China*

SYMPOSIUM CI - Progress in Electroceramics Research

Conveners: Jun Akedo, *Japan (Programme Chair)* Satoshi Wada, *Japan* *Members:* Sheikh Akbar, *USA* Dragan Damjanovic, *Switzerland* Brahim Dkhil, *France* Catherine Elissalde, *France* Mohammed Es-Souni, *Germany* Tor Grande, *Norway* Heli Maarit Jantunen, *Finland* Jong-Heun Lee, *South Korea* Jing-Feng Li, *China* Barbara Malic, *Slovenia* Liliana Mitoseriu, *Romania* Reginaldo Muccillo, *Brazil* Naoki Ohashi, *Japan* Lorena Pardo, *Spain* Ian M. Reaney, *UK* Jürgen Roedel, *Germany* Derek C. Sinclair, *UK* Danilo Suvorov, *Slovenia* Rick Ubic, *USA* Xiaohui Wang, *China* Tetsuya Yamamoto, *Japan* Shujun Zhang, *Australia*

SYMPOSIUM CJ - Materials Demands Towards Next Generation Electrochemical Energy Storage Systems

Convener: Steve G. Greenbaum, *USA* Members: Jaephil Cho, *South Korea* Claude Delmas, *France* Bruce S. Dunn, *USA* Kristina Edstrõm, *Sweden* Jorge Ribeiro Frade, *Portugal* Dominique Guyomard, *France* Jari Keskinen, *Finland* Li Lu, *Singapore* Shirley Meng, *USA* Alexander Michaelis, *Germany* Petr Novak, *Germany* Shigeto Okada, *Japan* Stefano Passerini, *Germany* Volker Presser, *Germany* Marcel Weil, *Germany* She-Huang Wu, *Taiwan*

SYMPOSIUM CK - Solid Oxide Fuel Cells: Materials and Technology Challenges

Conveners: Antonino S. Arico', *Italy (Programme Chair)* Massimiliano Lo Faro, *Italy* *Members:* Elisabetta Di Bartolomeo, *Italy* Elisabeth Djurado, *France* Juergen Fleig, *Austria* Teruhisa Horita, *Japan* John T.S. Irvine, *UK* Tatsumi Ishihara, *Japan* San Ping Jiang, *Australia* Tatsuya Kawada, *Japan* Michihisa Koyama, *Japan* Fernando M. Bico Marques, *Portugal* Nguyen Minh, *USA* Edward M. Sabolsky, *USA* Yixiang Shi, *China* Subhash C. Singhal, *USA* Stephen Skinner, *UK* Daria Vladikova, *Bulgaria*

CONGRESS COMMITTEES

SYMPOSIUM CL - Inorganic Materials Systems for Advanced Photonics

Convener: Maurizio Ferrari, *Italy* *Members:* Jean-Luc Adam, *France* John Ballato, *USA* Jonathan Bradley, *Canada* Louise Bradley, *Ireland* Alain Braud, *France* M. Lucia Curri, *Italy* Nahum Frage, *Israel* Dusan Galusek, *Slovakia* Adrian Goldstein, *Israel* Safa Kasap, *Canada* Oleg L. Khasanov, *Russia* Isabel Kinski, *Germany* Ming-Jun Li, *USA* Anna Lukowiak, *Poland* Sergey B. Mirov, *USA* Koji Morita, *Japan* Thomas Riedl, *Germany* Giancarlo C. Righini, *Italy* Pier-John Sazio, *UK* Angela Seddon, *UK* Katsuhisa Tanaka, *Japan* Dingyuan Tang, *Singapore* Anna Vedda, *Italy* Eric Yeatman, *UK* Edgar D. Zanotto, *Brazil*

SYMPOSIUM CM - Development and Application of Functional Transparent Conducting and Semiconducting Oxides

Conveners: David S. Ginley, *USA* *Members:* M. Daniel Bellet, *France* Claes G. Granqvist, *Sweden* Hideo Hosono, *Japan* Bharat Jalan, *USA* George Kiriakidis, *Greece* Andreas Klein, *Germany* Sang Yeol Lee, *South Korea* Yuzo Shigesato, *Japan* Chris G. Van De Walle, *USA* Tim Veal, *UK*

SYMPOSIUM CN - Geopolymers, Inorganic Polymers and Sustainable Materials

Convener: Vilma Ducman, *Slovenia* Waltraud M. Kriven, *USA* *Members:* Cengiz Bagci, *Turkey* Christopher Cheeseman, *UK* Joseph Davidovits, *France* Katja Dombrowski-Daube, *Germany* Gregor Gluth, *Germany* Pavel Krivenko, *Ukraine* Cristina Leonelli, *Italy* Zongjin Li, *China* Kenneth J.D. MacKenzie, *New Zealand* Angel Palomo Sanchez, *Spain* John Provis, *UK* Sylvie Rossignol, *France* Dong-Kyun (Don) Seo, *USA* Caijun Shi, *China* Arie Van Riessen, *Australia*

SYMPOSIUM CO - Science and Technology for Silicate Ceramics

Conveners: Michele Dondi, *Italy (Programme Chair)* Maximina Romero, *Spain* *Members:* Fernanda Andreola, *Italy* Richard Bowman, *Australia* Vilma Ducman, *Slovenia* Dolores Eliche Quesada, *Spain* Dachamir Hotza, *Brazil* Alpagut Kara, *Turkey* Ungsoo Kim, *South Korea* Joao A. Labrincha, *Portugal* Laila Mesrar, *France* Satyendra N. Misra, *India* Arnaldo Moreno Berto, *Spain* Pedro Munoz Velasco, *Chile* Janusz Partyka, *Poland* Yiannis Pontikes, *Belgium* Elisa Rambaldi, *Italy* Milica Vasic, *Serbia*

SYMPOSIUM CP - Refractory Materials Challenges to Meet Current and Future Industry Needs

Conveners: James P. Bennett, *USA* Jinichiro Nakano, *USA* *Members:* Christos G. Aneziris, *Germany* Carmen Baudin, *Spain* Goutam Bhattacharya, *India* Eric Blond, *France* Swapan Kumar Das, *India* Emmanuel De Bilbao, *France* Andrie M. Garbers-Craig, *South Africa* Patrick Gehre, *Germany* Dana Goski, *USA* Shinobu Hashimoto, *Japan* Marc Huger, *France* Helge Jansen, *Germany* In-Ho Jung, *South Korea* Yawei Li, *China* Carlos Pagliosa Neto, *Brazil* Victor Carlos Pandolfelli, *Brazil* Christopher Parr, *France* Jacques Poirier, *France* Peter Quirmbach, *Germany* Michael Rigaud, *Canada* Alberto N. Scian, *Argentina* Sido Sinnema, *Netherlands* Jeffrey D. Smith, *USA* Kiyoshi Sugita, *Japan* Hatsuo Taira, *Japan* Tom Troczynski, *Canada*

CQ - *9th International Conference* "Advanced Inorganic Fibre Composites for Structural and Thermal Management Applications"

Co-Chairs: Mrityunjay Singh, *USA (Convener)* Bernd Clauss, *Germany* Zhengyi Fu, *China* Tatsuki Ohji, *Japan* *Members:* Rajiv Asthana, *USA* Laifei Cheng, *China* Shaoming Dong, *China* Michael C. Halbig, *USA* Bernhard Heidenreich, *Germany* Toshihiro Ishikawa, *Japan* Walter Krenkel, *Germany* Jacques Lamon, *France* Sergei T. Mileiko, *Russia* Claudio Mingazzini, *Italy* Ji Yeon Park, *South Korea* Herwig Peterlik, *Austria* Gerard L. Vignoles, *France*

CR - *9th International Conference* "Science and Engineering of Novel Superconductors"

Co-Chairs: Ivan Bozovic, *USA* Davor Pavuna, *Switzerland (Convener)* John Wei, *Canada* *Members:* Evgeny V. Antipov, *Russia* Neven Barisic, *Austria* Paolo Calvani, *Italy* Paul C.W. Chu, *USA* Tord Claeson, *Sweden* Guy Deutscher, *Israel* Pascal Febvre, *France* Carlo Ferdeghini, *Italy* Fedor Gömöry, *Slovakia* Renato Gonnelli, *Italy* Bernhard Holzapfel, *Germany* Yoshihiro Iwasa, *Japan* Masatomu Murakami, *Japan* Xavier Obradors, *Spain* Yung Woo Park, *South Korea* Bernard Raveau, *France* Venkat Selvamanickam, *USA* Frank Steglich, *Germany* Denis Sunko, *Croatia* Yasutomo J. Uemura, *USA* Alexey Ustinov, *Germany* Andrey Varlamov, *Italy*

Outline Congress

Symposium CA
Advances in Processing Science and Manufacturing of High Performance Ceramics and Composites

Focused Session CA-9
Bio-inspired and Bio-enabled Processing

Focused Session CA-10
Functionally Graded Materials

Focused Session CA-11
SHS Ceramics

Focused Session CA-12
Ceramic Joining: From Macro- to Nano-length Scales

Symposium CB
Big Data and Machine Learning Methods for Materials Advancements

Symposium CC
Modelling, Simulation and Testing of Mechanical and Thermomechanical Properties of Bulk Ceramics, Coatings and Composites

Symposium CD
High and Ultra High Temperature Ceramics and Composites for Extreme Environments

Symposium CE
Progress in Nano-laminated Ternary Carbides, Nitrides and Borides (MAX/MAB) Phases and Derivatives Thereof (MXenes)

Symposium CF
Advances in Functional Materials for Energy Harvesting, Storage and Solar Fuels

Symposium CG
Ceramic Thin Films and Coatings for Protective, Tribological and Multifunctional Applications

Symposium CH
Porous Ceramics for Environmental Protection, Energy-related Technologies and Advanced Industrial Cycles

Symposium CI
Progress in Electroceramics Research

Symposium CJ
Materials Demands Towards Next Generation Electrochemical Energy Storage Systems

Symposium CK
Solid Oxide Fuel Cells: Materials and Technology Challenges

Symposium CL
Inorganic Materials Systems for Advanced Photonics

Symposium CM
Development and Application of Functional Transparent Conducting and Semiconducting Oxides

Symposium CN
Geopolymers, Inorganic Polymers and Sustainable Materials

Symposium CO
Science and Technology for Silicate Ceramics

Symposium CP
Refractory Materials Challenges to Meet Current and Future Industry Needs

Serial Conferences

CQ
9th International Conference
Advanced Inorganic Fibre Composites for Structural and Thermal Management Applications

CR
9th International Conference
Science and Engineering of Novel Superconductors

Sessions Timetable

15th International Ceramics Congress - June 20-24, 2022

Monday June 20

15.00-19.00
REGISTRATION
Centro Congressi Hotel Quattrotorri
Via Corcianese, 260
Perugia, Italy

Tuesday June 21

Morning: 9.30-13.00

Opening Session
Welcome Addresses
Plenary Lectures (C:PL1-PL3)

Afternoon: 14.30-19.00

Symposium CA	(CA-1:IL01 to IL03) (CA-9:IL01 to IL04)
Symposium CD	(CD-1:IL01 to IL03) (CD-1:IL04 to L06)
Symposium CE	(CE-1:IL01 to L04) (CE-1:IL05 to L08)
Symposium CF	(CF-1:IL01 to IL04) (CF-1:IL05 to IL07)
Symposium CG	(CG-1:IL01 to L05) (CG-1:L06 to L09)
Symposium CH	(CH-1:IL01 to IL03) (CH-1:IL04 to IL05)
Symposium CI	(CI-1:IL01 to IL03) (CI-1:IL04 to L07)
Symposium CK	(CK-1:IL01 to IL03) (CK-1:IL04 to L07)
Symposium CL	(CL-1:IL01 to IL03) (CL-2:IL01 to IL03)
Symposium CM	(CM-1:IL01 to IL03) (CM-1:IL04 to IL06)
Symposium CN	(CN-1:IL01 to IL03) (CN-1:IL04 to IL06)
Symposium CP	(CP-1:IL01 to IL02) (CP-2:IL01 to L05)
Conference CQ	(CQ-1:IL01 to L04) (CQ-2:IL01 to IL02)
Conference CR	(CR-1:IL01 to IL03) (CR-2:IL01 to IL03)

14.30-18.30
POSTER MOUNTING

20.30-22.00
Welcome Party

Wednesday June 22

Morning: 9.00-13.00

Symposium CA	(CA-1:IL04 to L07) (CA-1:L08 to L14) (CA-5:IL06 to L09) (CA-5:L10 to L13) (CA-9:IL05 to L10) (CA-10:IL01 to IL03)
Symposium CB	(CB-1:KL1+IL01 to IL02) (CB-1:IL03 to IL05)
Symposium CC	(CC-1:IL01 to IL03) (CC-1:IL04 to IL06)
Symposium CD	(CD-1:IL07 to L10) (CD-1:IL11 to L14)
Symposium CE	(CE-2:IL01 to L05) (CE-2:IL06 to L11)
Symposium CF	(CF-1:IL08 to L13) (CF-1:IL14 to IL17)
Symposium CG	(CG-2:IL01 to IL05) (CG-2:IL06 to IL09)
Symposium CH	(CH-1:IL06 to IL08) (CH-1:IL09 to L12)
Symposium CI	(CI-1:IL08 to L12) (CI-2:IL01 to IL04)
Symposium CJ	(CJ-1:IL01 to IL03) (CJ-1:IL04 to IL06)
Symposium CK	(CK-2:IL01 to IL03) (CK-2:IL04 to IL05)
Symposium CL	(CL-1:IL04 to L07) (CL-2:IL04 to L08)
Symposium CN	(CN-1:IL07 to L09) (CN-1:IL10 to L14)
Symposium CP	(CP-3:IL01 to IL03) (CP-4:IL01 to L04)
Conference CQ	(CQ-2:IL03 to L04) (CQ-3:IL01 to IL04)
Conference CR	(CR-1:IL04 to IL05) (CR-3:IL01 to IL04)

Afternoon: 14.30-19.00

Symposium CA	(CA-2:IL01 to IL02) (CA-3:IL01 to L04) (CA-3:IL05 to L08) (CA-10:IL04 to L08) (CA-11.1:IL01 to L05)
Symposium CB	(CB-1:IL06 to IL07) (CB-1:IL08 to L09)
Symposium CC	(CC-1:IL07 to L10) (CC-1:IL11 to L14)
Symposium CD	(CD-2:IL01 to IL03) (CD-2:IL04 to L07)
Symposium CE	(CE-3:IL01 to L05) (CE-3:IL06 to L10)
Symposium CF	(CF-1:IL18 to L23) (CF-2:IL01 to IL02)
Symposium CG	(CG-2:IL10 to L14)
Symposium CH	(CH-2:IL01 to L04) (CH-3:IL01 to L03)
Symposium CI	(CI-2:IL05 to IL08) (CI-2:IL09 to L13)
Symposium CJ	(CJ-1:IL07 to IL09) (CJ-1:IL10 to L13)
Symposium CK	(CK-2:IL07 to L09) (CK-2:IL10 to L12)
Symposium CL	(CL-3:IL01 to IL02) (CL-4:IL01 to IL05)
Symposium CM	(CM-1:IL07 to IL09) (CM-2:IL01 to IL03)
Symposium CN	(CN-2:IL01 to L05) (CN-2:IL06 to L08)
Symposium CP	(CP-3:IL04 to L06) (CP-5:IL01 to IL04)
Conference CQ	(CQ-3:IL05 to L09) (CQ-4:IL01 to L03)
Conference CR	(CR-3:IL05 to IL07) (CR-3:IL08 to L11)

Thursday June 23

Morning: 9.00-13.00

Symposium CA	(CA-4:IL01 to L06) (CA-6:KL+IL01 to L02) (CA-11.2:IL01 to L05) (CA-11.3:IL01 to IL04)
Symposium CB	(CB-2:KL1+IL01 to IL02) (CB-2:KL2+IL03 to IL04)
Symposium CC	(CC-1:IL15 to IL17) (CC-2:IL01 to IL03)
Symposium CD	(CD-2:IL09 to IL11) (CD-3:IL01 to IL02)
Symposium CE	(CE-4:IL01 to L04) (CE-4:IL05 to L08)
Symposium CF	(CF-2:IL03 to IL05) (CF-2:IL06 to IL08)
Symposium CG	(CG-3:IL01 to IL04) (CG-3:IL05 to IL08)
Symposium CH	(CH-3:IL04 to L07) (CH-4:IL01 to IL02)
Symposium CI	(CI-2:IL14 to IL17) (CI-2:IL18 to L22)
Symposium CJ	(CJ-1:IL14 to IL16) (CJ-1:IL17 to L20)
Symposium CK	(CK-3:IL01 to L05) (CK-4:IL01 to IL02)
Symposium CL	(CL-3:IL03 to L06) (CL-6:IL01 to IL03)
Symposium CM	(CM-2:IL04 to IL06) (CM-2:IL07 to IL09)
Symposium CN	(CN-3:IL01 to L04) (CN-3:IL05 to L07)
Symposium CO	(CO-1:IL01 to L04) (CO-3:IL01 to IL04)
Symposium CP	(CP-6:IL01 to IL03) (CP-6:IL04 to L07)
Conference CQ	(CQ-4:IL04 to IL06) (CQ-5:IL01 to IL04)
Conference CR	(CR-4:IL01 to IL02) (CR-5:IL01 to IL03)

Afternoon: 14.30-19.00

Symposium CA	(CA-5:IL02 to IL05) (CA-6:IL03 to L06) (CA-11.2:IL06 to L08) (CA-11.3:IL05 to L07) (CA-11.4:IL01 to L02)
Symposium CB	(CB-2:IL05 to L07) (CB-2:IL08 to IL09)
Symposium CC	(CC-2:IL04 to IL05) (CC-2:IL06 to L07)
Symposium CD	(CD-3:IL03 to IL06) (CD-3:IL07 to L09)
Symposium CE	(CE-5:IL01 to L05) (CE-5:IL06 to L09)
Symposium CF	(CF-2:IL09 to L11) (CF-2:IL12 to L16)
Symposium CG	(CG-3:IL09 to IL12)
Symposium CJ	(CJ-1:IL21 to IL23) (CJ-1:IL24 to L27)
Symposium CK	(CK-4:IL03 to IL04) (CK-4:IL05 to IL06)
Symposium CL	(CL-5:IL01 to IL05) (CL-6:IL04 to IL06)
Symposium CM	(CM-2:IL10 to IL11) (CM-3:IL01 to IL04)
Symposium CO	(CO-1:IL05 to IL08) (CO-2:IL01 to L03)
Conference CQ	(CQ-4:IL07 to L10) (CQ-6:IL01 to IL04)
Conference CR	(CR-5:IL04 to IL06) (CR-6:IL01 to IL02)

Friday June 24

Morning: 9.00-13.00

Symposium CA	(CA-6:IL07 to L12) (CA-7:IL01 to L04) (CA-12.1:IL01 to IL04) (CA-12.2:IL01 to L03)
Symposium CC	(CC-3:IL01 to L03) (CC-3:IL04 to IL06)
Symposium CD	(CD-4:IL01 to IL03) (CD-4:IL04 to IL05)
Symposium CE	(CE-6:IL01 to IL03) (CE-6:IL04 to L06)
Symposium CF	(CF-3:IL01 to L03) (CF-3:IL04 to IL06)
Symposium CG	(CG-4:IL01 to IL04) (CG-4:IL05 to IL08)
Symposium CH	(CH-5:IL01 to L04) (CH-6:IL01 to IL03)
Symposium CI	(CI-3:IL01 to L04) (CI-4:IL01 to IL04)
Symposium CJ	(CJ-2:IL01 to IL03) (CJ-2:IL04 to IL06)
Symposium CK	(CK-5:IL01 to IL03) (CK-5:IL04 to IL06)
Symposium CL	(CL-7:IL01 to L04) (CL-7:IL05 to IL08)
Symposium CN	(CN-3:IL08 to IL09) (CN-4:IL01 to L04)
Symposium CO	(CO-2:IL04 to L06) (CO-3:IL05 to IL07) (CO-4:IL01-L03)
Symposium CP	(CP-6:IL08 to L11) (CP-8:IL01 to L03)

Afternoon: 14.30-18.30

Symposium CA	(CA-7:IL05 to L09) (CA-12.2:IL04 to L08)
Symposium CE	(CE-7:L01 to IL05)
Symposium CG	(CG-4:IL09 to IL12)
Symposium CN	(CN-4:IL05 to IL07)
Symposium CO	(CO-4:L04 to L08)
Symposium CP	(CP-7:IL01 to IL03)

16.30-18.30
POSTER DISCUSSION

20.30-23.00
Closure Dinner

Code Number of contributions by Presenting Author
(in alphabetical order)

The Code Number XY-W:Z00 includes: XY Symposium; W Session; Z Type of presentation (PL, KL, IL, L, P)*; 00 Paper number

* PL Plenary KL Keynote Lecture IL Invited Lecture L Contributed Lecture P Poster presentation

NOTE: Due to the restructuring of some symposia, the session number included in the Code may differ from the one selected by the Presenting Author in the Abstract Submission Form

Adam Jean-Luc	CL-4:IL03	Beidaghi Majid	CE-6:IL03	Chen Xiang Ming	CI-1:IL05
Adamopoulos George	CM-3:IL04	Belanger Daniel	CJ-2:IL01	Cheng Laifei	CQ-5:IL04
Adschiri Tadafumi	CF-1:L13	Belardi Walter	CL-4:IL04	Chiasera Alessandro	CL-5:L04
Aghajanyan Nella	C:P23	Belyaev Ilya	C:P29	Chihi Rania	CH-1:L12
Aguadero Ainara	CJ-1:IL17	Bencan Golob Andreja	CI-2:IL10	Ching Wai-Yim	CB-1:IL02
Aizenberg Joanna	CA-9:IL01	Benhabib Siham	CR-3:IL02	Choi Ji Hoon	C:P33
Aizikovich Sergey	CA-10:IL02	Berg Erik J.	CJ-1:IL03	Choi Kyoung-Kyu	C:P62
Akedo Jun	CG-3:IL05	Berger Lutz-Michael	CG-3:IL10	Chollon Georges	CQ-1:IL02
Akhtar Farid	CH-2:IL02	Bernard Samuel	CA-3:IL02	Chua Daniel	CF-1:IL07
Akkasoglu Ufuk	CI-1:L07	Bernardo Enrico	CN-1:IL07	Cinibulk Michael H.	CQ-2:IL01
Albrecht Wiebke	CL-6:IL01	Bernhard Christian	CR-5:IL05	Clauss Bernd	CQ-1:IL01
Aleksanyan Anahit	C:P21	Bespalko Yuliya	CK-2:L12	Clemens Frank	CA-6:L05
Alguero Miguel	CI-3:IL03	Betke Ulf	CH-3:IL02	Cochard Charlotte	CI-1:IL04
Aliouat Anis	CA-5:L09	Bezzi Federica	CA-6:L02	Combes Christele	CA-9:IL04
Allen Martin	CM-1:IL03	Biegerl Andreas	CA-1:L10	Comin Riccardo	CR-3:IL01
Al-Murish Mohanad	CL-1:L05	Biesuz Mattia	CA-7:L07	Concina Isabella	CF-2:IL10
Alresheedi Faisal	CG-1:L08	Bignozzi Maria Chiara	CN-1:IL04	Condurache Oana	CI-2:L22
Al-Zeer Mohammad	CN-3:IL06	Binner Jon	CQ-3:IL01	Conte Sonia	CO-1:L07
Amirkhanyan Narine	C:P24	Birkel Christina	CE-2:IL02	Cordero Zachary	CA-6:IL03
Ammar Mohamed-Ramzi	CP-2:IL02	Bizot Quentin	CA-11.1:L05	Corpas Iglesias Francisco A.	CN-1:IL05
Amorin Harvey	CI-3:IL01	Björk Jonas	CE-1:L08	Corradetti Stefano	CD-1:L12
An Kyong Jun	C:P08	Boccaccini Dino	CO-3:IL04	Couder Christophe	C:P11
Andre Damien	CP-5:IL02	Bogachev Evgeny	CQ-3:IL02	Couegnat Guillaume	CQ-4:IL05
Antipov Evgeny V.	CJ-1:IL10	Bolelli Giovanni	CG-3:IL11	Coyle Thomas	CG-3:IL01
Archer Thibaut	CD-3:L05	Bombarda Ilaria	CK-1:L07	Crozier Peter A.	CK-1:IL04
Arndt Tabea	CR-6:IL01	Bonnal Justine	CG-4:L10	Ctibor Pavel	CI-1:L12
Asthana Rajiv	CQ-2:IL03	Bosio Barbara	CK-5:IL01	Cussen Edmund	CI-4:IL03
Aydinyan Sofiya	CA-11.2:L03	Botton Gianluigi	CR-1:IL02	Daghero Dario	CR-2:IL01
Azina Clio	CE-3:IL01	Bowman Richard	CO-1:IL05	Dahlqvist Martin	CE-1:IL05
Azuma Masaki	CI-3:IL02	Bozic Mojca	C:P55	Dai Jian-Guo	CN-2:IL07
Badr Hussein	CE-2:L04	Bradley Jonathan	CL-5:IL05	Dal Poggetto Giuovanni	CN-2:L08
Baek Sangwon	C:P40	Bradley Louise	CL-5:IL02	Dalpian G. Martin	CF-3:IL06
Bafti Arijeta	CN-2:L04	Braun Artur	CF-2:IL04	Das Poddar Dipanjan	CP-6:IL08
Bai Chengying	CH-6:IL01	Brenner Donald	CD-4:IL01	Daskalakis Evangelos	C:P19
Bai Yuelei	CE-3:IL07	Brette Florian	CE-5:L09	De Aloysio Giulia	CQ-4:L10
Bakan Emine	CG-4:IL07	Bruno Giovanni	CC-3:IL05	De Bilbao Emmanuel	CP-4:IL03
Balaya Palani	CJ-1:IL11	Burriel Monica	CF-1:L12	De Marzi Anna	CA-6:L10
Balazsi Csaba	CC-3:IL06	Campagna Zignani Sabrina	CK-3:L05	De Noni Jr. Agenor	CO-3:IL07
Balda Rolindes	CL-3:IL02	Cano Crespo Rafael	CD-3:L09	De Souza Flavio Leandro	CF-2:L15
Balducci Andrea	CJ-2:IL02	Cao Wenbin	CF-2:IL12	De Zanet Alessandro	CA-12.2:L06
Barankova Hana	CG-1:IL01	Cardinal Thierry	CL-7:IL03	Delmas Claude	CJ-1:IL01
Baras Florence	CA-11.1:IL01	Carey Michael	CE-4:L04	Delobel Florimond	CP-3:L06
Barbarossa Simone	CD-1:L08	Carlsson Adam	CE-1:L07	Demange Valerie	CF-1:IL06
Barisic Neven	CR-3:IL10	Carpanese M. Paola	CK-4:IL03	Denny Yus Rama	CI-3:L04
Barnett Scott	CK-2:IL02	Carty William	CA-1:L06	Deuermeier Jonas	CM-2:IL02
Barquinha Pedro	CM-3:IL03		CP-8:IL01	Di Castro Daniele	CR-1:IL01
Barreca Davide	CF-1:IL05	Caspi El'ad	CE-5:IL07	Didier Florian	CF-1:L10
Barsoum Michel	C:PL2	Cavalli Lorenzo	CD-1:L09	Djurado Elisabeth	CK-2:IL01
	CE-2:IL01	Cedillo-Gonzalez Erika Iveth	CO-2:L05	Ducman Vilma	CN-4:IL01
Batalu Dan	C:P63	Celerier Stephane	CE-7:IL05	Dudina Dina	CA-11-2:IL01
Battaile Corbett	CB-2:KL2	Celikbilek Ozden	CF-1:L22	Dugger Michael	CG-2:IL08
Bechthold Martin	CA-9:IL03	Cerc Korosec Romana	CF-2:L16	Dunn Bruce	CJ-2:IL04
Bednarkiewicz Artur	CL-6:IL03	Chen Daolun	CC-3:IL04	Dusza Jan	CC-1:IL02

Eberling-Fux Nicolas CA-1:L12
Eklund Per CG-2:IL13
El Kazzi Mario CJ-1:IL14
Eliche Quesada Dolores CN-4:L04
Elisa Mihail C:P47
Elissalde Catherine CI-2:IL17
Ellmer Klaus CM-1:IL08
Elsayed Hamada CN-1:L12
Engels Marcel CO-3:IL05
Epple Matthias CA-9:IL06
Erbereli Rogerio C:P16
Erdemir Ali CG-3:IL09
Eslava Salvador CF-2:IL03
Essmeister Johannes CA-3:L08
Estournes Claude CA-5:L07
Fabri Noy C:P05
Fahrenholtz William G. CD-3:IL01
Failla Simone CD-1:L14
Falcaro Paolo CF-1:IL02
Faure Lauriane CA-5:L11
Fernandez-Jimenez Ana CN-4:IL02
Ferrari Begoña CA-6:L04
Ferraris Monica CQ-6:IL02
Fersini Maurizio CA-1:L09
Feteira Antonio CI-2:IL07
Fey Tobias CH-6:IL02
Filipponi Alessandro CN-3:L07
Fontaine Marie-Laure CK-4:IL05
Fontes Vieira Carlos M. CO-1:IL08
Fornari Roberto CM-2:IL08
Franchin Giorgia CH-1:IL04
Franz Robert CG-2:IL09
Fraser Hamish L. CB-2:IL06
Frey Marco C:P44
Friedrich Holger CA-1:L07
Fujima Takuya CH-3:L07
Fukushima Jun CA-4:IL03
Fukushima Manabu CH-1:IL02
Gadow Rainer CG-3:IL02
Galusek Dusan CA-7:IL02
Garbers-Craig Andrie M. CP-3:IL01
Garcia Rafael CE-2:L10
Garcia Gabaldon Montserrat C:P42
Garcia-Lodeiro Ines CN-1:IL03
Gasparrini Claudia CD-2:IL09
Gaubicher Joel CJ-1:IL07
Gauthier-Brunet Veronique CE-3:IL06
Gavalda-Diaz Oriol CC-3:IL01
Gehre Patrick CP-6:IL05
Gerhardt Rosario A. CM-2:IL10
Ghosh Ajay Kumar CR-3:L11
Ghoshal Anindya CG-4:IL08
Ghyngazov Segei C:P06
Gilda Marwa CN-1:L13
Ginley David CM-2:IL01
Giovannelli Fabien CF-1:IL04
Giuntini Diletta CA-5:L10
Giuranno Donatella CA-12.1:IL03
Gluchowski Pawel CL-2:IL05
Gobbin Filippo CA-6:L12
Gogotsi Yury C:PL2
Goldstein Adrian CL-2:IL04
Goller Ralf CB-1:L09
CQ-5:IL02
Golodnitsky Diana CJ-1:IL05
Gomez Garcia Diego CC-1:IL16
Gömöry Fedor CR-6:IL02
Gonzalez Granados Zoilo CA-7:IL05
Gonzalez-Julian Jesus CE-3:IL02
Goski Dana CP-3:IL02
Grader Gideon CH-1:IL05
Grass Vladislav C:P27
Graule Thomas CA-6:IL07
Greenbaum Steve G. CJ-1:IL24
Gregory Duncan CJ-1:IL08
Grilli Selene C:P01
Grippi Thomas CC-1:L12
Gruber Dietmar CP-5:IL03
Grundmann Marius CM-2:IL07
Guarnieri Massimo CJ-1:IL26
Gubarevich Anna V. CA-11.3:IL04
Guillemoles Jean François CF-3:IL04
Guillon Olivier CA-1:IL05
Gulsoy Ozkan CA-1:L08
Günhan Büşra CG-3:L03
Gupta Mohit CG-4:IL04
Gupta Surojit CE-4:IL05
Gurauskis Jonas CH-1:IL11
Gurlo Aleksander CH-1:IL07
Hadian Amir CA-6:L11
Hahn Yoon-Bong CF-1:IL17
Hajri Imen C:P09
Halim Joseph C:P28
Hamadouche Ines CC-2:L07
Han Il Ki C:P51
Han Jeong Hwan C:P52
Hanzel Ondrej CD-1:L10
Hao Dong CO-4:L04
Hardwick Laurence CJ-1:L27
Harmon Alexandre CA-6:L06
Hart Judy CF-2:L13
Hasegawa Masashi CC-1:IL07
Hautier Geoffrey CM-2:IL04
Helmer Pernilla CE-1:L04
Herborn Ralf CQ-1:L04
Herisson De Beauvoir T. CA-5:L13
Hernández-Álvarez Christian C:P48
Hilmas Greg CD-3:IL06
Hinoki Tatsuya CQ-6:IL04
Hinzer Karin CF-3:IL01
Holm Elizabeth CB-2:IL03
Holtappels Peter CK-2:IL08
Hong Soon-Ku C:P49
Hori Satoshi CJ-1:IL23
Horita Teruhisa CK-4:IL04
Horvat Barbara C:P56
Hovsepian Papken CG-2:L14
Hu Jianbao CQ-4:IL08
Huang Jun-Wei C:P18
Huang Qing CE-1:IL03
Hubert Maxime CK-5:IL03
Huger Marc CP-2:IL01
Humphry-Baker Samuel CD-2:IL05
Hussain Tanvir CG-3:IL08
Hutterer Patrick CD-1:L13
Hvizdoš Pavol C:P14
Hwang Bing Joe CJ-1:IL09
Iavarone Maria CR-3:IL05
Iida Kazumasa CR-2:IL03
Ikuhara Yuichi CA-12.1:IL02
Iliya Ezekiel CA-9:L10
Imanaka Nobuhito CF-1:IL09
Imanaka Yoshihiko CI-1:IL09
Inoue Mitsuteru CL-7:IL06
Ioppolo Tindaro CL-5:IL03
Iqbal Neelam C:P17
Ishikawa Toshihiro CQ-1:IL03
Ishiyama Tomohiro CK-3:IL03
Istomin Pavel C:P22
Istomina Elena C:P61
Isu Norifumi CH-6:IL03
Ito Takahiro CE-5:IL06
Ivanova Mariya CK-2:IL05
Iwamoto Yuji CH-3:IL06
Jalan Bharat CM-2:IL09
Jang Byung-Koog CD-2:IL03
Janotti Anderson CI-4:IL01
Jantunen Heli Maarit CI-1:IL01
Jastrzebska Agnieszka CE-3:L10
Jaud Alexandre CG-2:L02
Jayaram Vikram CG-4:IL05
Jeurgens Lars CA-11.3:IL06
Jiang Shibin CL-7:IL02
Joshi Shrikant CG-3:IL04
Joulain Anne CE-3:L04
Jung In-Ho CP-4:IL02
Jung Yousung CB-2:L07
Kaczmarczyk Karolina CC-1:L13
Kalscheuer Christian CG-2:IL01
Kamseu Elie CN-4:IL07
Kang Suk-Joong L. CA-1:IL01
Karakassides Michael C:P60
Karamanov Alexander CO-4:IL02
Kareiva Aivaras CL-2:IL03
Kavan Ladislav CJ-1:L12
Kaya Guray C:P36
Khan Ramsha CF-2:L11
Khasanov Oleg L. CL-2:IL01
Khina Boris B. CA-11.1:IL02
Kim Byung-Nam CC-1:L10
Kim Dong-Pyo CH-1:IL06
Kim Eun Kyu C:P53
Kim Hai-Doo CD-3:IL07
Kim Hyojin C:P32
Kim Young-Wook CH-3:IL01
Kim Yunseok CI-2:IL14
Kimura Teiichi CA-7:IL06
Kirakosyan Hasmik CA-11.2:L05
Kliem Herbert CI-1:L06
Klotz Dino CK-1:IL02
Knowles Kevin M. CA-12.2:IL02
Kobayashi Genki CK-1:IL05
Koblischka Michael CR-5:IL02

Koblischka-Veneva Anjela CR-1:IL05
Koch Dietmar CD-1:IL01
Konegger Thomas CA-3:IL03
Kovalcikova Alexandra CD-2:L06
Kozinsky Boris CB-1:IL06
Kraft Bastian CP-6:L06
Krenkel Walter CQ-6:IL01
Kriegel Ilka CL-1:IL02
Krinitcyn Maksim CE-4:L08
Krishnan N.M. Anoop CB-2:IL04
Kristály Ferenc CO-4:IL01
Krivenko Pavel CN-4:IL05
Krivtsov Igor CF-1:IL18
Kroedel Matthias CQ-6:IL03
Kröger Nils CA-9:IL02
Kroll Peter CA-3:L06
Kronberg Thomas CO-4:L03
Krotkevich Dmitriy CA-10:L05
Krutovertsev Sergey C:P54
Kubitza Niels C:P30
Kulik Alexey CQ-3:IL07
Kunimine Takahiro CA-10:IL04
Kunz Willy CD-2:IL11
Kurbatkina Viktoriia CA-11.3:L07
Kuroiwa Yoshihiro CI-2:IL08
Lambertin David CN-2:IL01
Lambrinou Konstantina CE-7:IL04
Lamm Rolf CP-7:IL03
Lamon Jacques CQ-5:IL01
Lancellotti Isabella CN-2:IL06
Lantsev Evgeni C:P13
Lavrencic Stangar Urska CO-3:IL02
Lazzeri Andrea CQ-3:IL03
Lee Hak Hyeon C:P34
Lee Ho-Yong CI-2:IL20
Lee Jehyun CB-1:IL07
Lee Kang CD-2:IL01
Lee Sea Hoon CD-1:IL04
Lee Wei-Cheng CM-3:IL02
Leite Edson Roberto CF-2:IL05
Lenser Christian CK-4:IL06
Leon Aline CK-1:IL03
Leonelli Cristina CN-1:IL10
Leriche Anne CA-1:IL02
Lethien Christophe CJ-2:IL05
Letz Martin CI-1:IL02
Levashov Evgeny CA-11.3:IL03
Levi Carlos G. CG-4:IL02
Li Heping CC-2:IL03
Li Jing-Feng CI-2:IL11
Li Ling CA-9:IL05
Li Longbiao CD-4:IL02
Li Ruixing C:P26
Li Shibo CE-4:IL07
Li Yawei CP-3:IL03
Lin Hua-Tay CC-2:IL06
Liu Xingbo CK-3:IL01
Liu Yunya CI-2:IL15
Lorenz Michael CM-2:IL06
Lourenco Alves Carine CO-4:L08
Luan Xingang CQ-4:L03
Lukowiak Anna CL-2:IL02
Luo Jian CA-5:IL02
CB-1:IL04
Lutkenhaus Jodie CE-4:IL01
Lyons John CM-1:IL04
Lysenko Elena C:P03
Macak Jan CF-1:IL15
Mack Daniel Emil CC-2:IL02
Macken Joshua CA-7:L04
Macrelli Guglielmo CL-6:IL05
Mady Franck CL-4:IL01
Maier Jonathan CQ-2:L04
Maille Laurence CQ-3:IL06
Maillet Emmanuel CC-3:IL02
Malandrino Graziella CF-1:IL14
Malchiodi Beatrice CA-1:L14
Malfliet Annelies CP-6:IL04
Mandic Vilko CF-3:L03
Mangolini Filippo CG-2:IL07
Maniere Charles CA-4:IL04
Manthiram Arumugam CJ-1:IL04
Marder Rachel CA-1:L13
Margarido Menegazzo A.P. CO-4:IL07
Margueron Samuel CF-1:IL16
Marinel Sylvain CA-4:IL01
Marques Fernando CK-4:IL01
Marschall Roland CF-2:IL09
Martin Manfred CK-5:IL05
Martinez-Garcia Carmen C:P57
Masai Hirokazu CL-2:IL06
Mascotto Simone CK-1:L06
Masi Giulia CN-2:L05
Massi Marcos C:P39
Mather Glenn CK-2:IL04
Mathur Sanjay CF-2:IL01
Matovic Branko CD-1:IL11
Matsuzaki Yoshio CK-4:IL02
Mauchamp Vincent CE-5:L08
Medri Valentina CH-2:IL01
Medvedeva Julia E. CM-1:IL01
Medvedeva Nadezhda C:P46
Medvedovski Eugene CC-1:IL05
Meille Sylvain CH-3:IL05
Mejauschek Markus CG-1:IL03
Mendez-Ramos Jorge CL-6:IL04
Mera Gabriela CA-3:IL05
Mesarovic Sinisa Dj CA-12.2:L03
Mesrar Laila C:P58
Messinger Robert CJ-1:IL16
Michaelis Alexander CA-6:KL
Mileiko Sergei T. CQ-3:IL05
Miljevic Bojan CF-1:L21
Mingazzini Claudio CQ-3:L09
Miryala Muralidhar CR-3:IL04
Mitra Rahul CD-2:L07
Miura-Fujiwara Eri CA-10:IL03
Mizera Adrian C:P41
Mizoguchi Terayasu CB-2:IL05
Mochalin Vadym CE-6:IL04
Modreanu Mircea CM-1:IL05
Molinari Chiara CO-2:L03
Molinari Flora C:P15
Monrós Guillermo CO-2:IL04
Montero Amenedo José CM-1:IL02
Moosburger-Will Judith CQ-2:IL02
Morales-Masis Monica CM-3:IL01
Morante Juan CF-2:IL02
Moreno Arnaldo CO-2:IL02
Moreno Rodrigo CH-1:IL03
Mori Tatsuya CL-6:IL06
Morrison Finlay CI-2:IL05
Mortier Michel CL-3:IL03
Moshtaghioun Bibi Malmal CA-5:L12
Mouiya Mossaab CP-2:L04
Muccillo Eliana N.S. CA-5:IL05
Muccillo Reginaldo CH-2:L04
Mukasyan Alexander CA-11.2:IL07
Mumm Daniel R. CG-4:IL09
Muñoz Velasco Pedro CO-1:IL01
Muracchioli Mattia CN-2:L03
Muradyan Garnik CE-2:L07
Muto Shunsuke CB-2:IL02
Naccache Rafik CF-1:IL08
Nadeem Aamir CG-1:L07
Naguib Michael CE-7:IL03
Nahif Farwah CG-2:IL05
Nait-Ali Benoit CH-4:IL02
Naito Makio CA-7:IL03
Nakamoto Masashi CA-12.2:IL04
Nakamura Ai C:P38
Nakamura Atsutomo CC-1:IL15
Nakano Jinichiro CP-6:IL02
Nalin Marcelo CL-4:IL05
Natu Varun CE-3:L08
Nazabal Virginie CL-7:L04
Nazaretyan Khachik C:P20
Nazarlou Ziba CE-6:L06
N'cho Wilfried Cyrille CN-3:L04
Neale Alex CJ-1:L13
Nematollahi Behzad CN-3:IL01
Nemec Petr CG-1:L02
Nenning Andreas CK-5:IL04
Netinger Grubesa Ivanka CO-4:IL05
Ni De-Wei CQ-4:IL06
Nickel Klaus CH-5:IL01
Nitta Ryosuke CJ-2:IL06
Noeth Andreas CG-4:L11
Novais Rui M. CN-3:IL09
Odawara Osamu CA-11.4:L02
Ohji Tatsuki CQ-4:IL04
Ohno Ko-ichiro CA-12.2:IL07
Okubo Masashi CE-6:IL02
Olevano Daniela CP-8:L03
Olevsky Eugene A. CA-5:IL04
Omata Takahisa CI-4:IL02
Opitz Alexander K. CK-5:IL02
Orru' Roberto CA-11.2:IL06
Ortona Alberto CH-4:IL01
Osofsky Michael CR-3:IL09
Ouisse Thierry CE-5:IL01
Pabst Willi CH-5:IL03
Packard Corinne CA-12.1:IL04

Pan Wei	CC-2:IL05
Pandolfelli Victor Carlos	CP-6:IL01
Panzic Ivana	CF-2:L14
Papa Elettra	CN-3:IL02
Papanikolaou Stefanos	CB-2:IL08
Park Byeong-Jun	CI-2:L13
Park Joohyun	CP-3:IL05
Parr Christopher	CP-7:IL02
Pateloup Vincent	CA-6:IL08
Patscheider Jörg	CG-2:IL12
Patterson Griffin	CP-8:IL02
Pavlin Majda	CN-4:L03
Pazniak Hanna	CE-5:L03
Peelaers Hartwin	CM-1:IL09
Peng Hong	CP-6:IL09
Penner Dirk	CH-1:IL10
Pérez Villarejo Luis	CO-1:IL06
Perez-Herranz Valentin	C:P43
Perumal Priyadharshini	CN-1:IL06
Petit Laeticia	CL-2:L08
Petrozza Annamaria	CF-3:IL05
Petry Nils-Christian	CG-1:L06
Piatti Erik	CR-3:IL03
Piccardo Paolo	CK-2:IL10
Pilate Pascal	CP-5:IL01
Pithan Christian	CI-1:L11
Pizzi Giovanni	CB-1:IL08
Pledel Quentin	CP-4:L04
Pogozhev Yury	CA-11.2:L08
Poirier Jacques	CP-3:IL04
Politano Olivier	CA-11.1:IL03
Pontikes Yiannis	CN-1:IL08
Potashnikov Daniel	CE-5:L04
Prehal Christian	CJ-1:IL22
Presser Volker	CJ-1:IL21
Prete Paola	CF-1:IL19
Prikhna Tatiana	CD-2:IL10
Profeta Gianni	CR-4:IL02
Pullar Robert	CI-1:IL08
Qazzazie-Hauser Afnan	C:P10
Qu Dandan	CA-10:IL01
Radon Adrian	CI-1:L10
Radovic Miladin	CE-3:IL03
Raikova Gergana	CK-3:IL04
Rajan Siddharth	CM-2:IL03
Rambaldi Elisa	CO-3:IL01
Ramirez Mariola O.	CL-1:IL03
Ramult Jakub	CP-2:L05
Ratzker Barak	CL-2:L07
Ravier Guillaume	CG-1:L09
Rebholz Claus	CD-1:IL03
Reece Michael	CC-1:IL01
Reimer Thomas	CD-3:IL02
Ren Wencai	CE-2:IL06
Reynaud Pascal	CQ-4:IL02
Rheinheimer Wolfgang	CA-5:IL06
Riaz Adeel	CK-2:L11
Riedel Ralf	C:PL1
	CA-3:IL01
Rigaud Michel	CP-7:IL01
Riquet Guillaume	CA-4:L06
Rodriguez-Barboza Loth I.	CN-1:L14
Rogachev Alexander S.	CA-11.3:IL01
Roger Jerome	CQ-3:IL04
Rojo Teofilo	CJ-1:IL15
Romero Maximina	C:P59
Rosen Johanna	CE-1:IL01
Rossignol Sylvie	CN-1:IL02
Rougier Aline	CM-2:IL05
Rutkowska Izabela	CA-3:L04
Rybakov Kirill	CA-4:IL02
Saha Gobinda	CG-3:IL07
Sajgalik Pavol	CC-1:IL08
Sakaida Shun	CE-7:IL02
Samadi Soheil	CC-1:L09
Sampath Sanjay	CG-4:IL12
Sanchez-Herencia A. Javier	CD-1:L06
Santato Clara	CF-1:IL03
Sanvito Stefano	CD-4:IL05
Sarraf Fateme	CA-3:L07
Sato Yukio	CI-2:IL06
Sauder Cedric	CQ-4:IL09
Savino Raffaele	CD-2:IL04
Sayet Thomas	CP-4:IL01
Sazio Pier-John	CL-4:IL02
Scheffler Michael	CH-1:IL01
Scheibel Thomas	CA-9:IL08
Schemmel Thomas	CP-6:L11
Schmidt Volker	CB-2:IL01
Schneider Jochen M.	CE-4:IL03
Schrefl Thomas	CB-2:IL09
Schulz Uwe	CG-4:IL01
Sciti Diletta	CD-1:IL02
Scotognella Francesco	CL-7:IL08
Seddon Angela	CL-3:IL01
Sekino Tohru	CF-1:IL20
Selvamanickam Venkat	CR-5:IL04
Seo Dong-Bum	CF-1:L23
Serdar Marijana	CN-3:IL08
Serizawa Hisashi	CA-12.2:IL05
Sglavo Vincenzo M.	CA-5:IL03
Shakeri Mohammad Sadegh	CA-10:L06
Shalabi Yathreb	C:P04
Shcherbak Gleb	CC-1:L14
Sheindlin Michael	CD-3:L08
Shepa Ivan	C:P31
Shevchenko Vladimir	CA-6:L09
Shi Caijun	CN-2:IL02
Shi Yuan	CQ-4:IL07
Shibauchi Takasada	CR-3:IL08
Shilova Olga	CA-9:IL07
Shimazaki Masahito	C:P37
Shinoda Kentaro	CG-3:IL06
Shore Dominic	CG-1:L04
Shtansky Dmitry V.	CG-2:IL11
Si Qimiao	CR-4:IL01
Sidelev Dmitrii	CG-2:L04
Sigov Alexander	CI-2:L21
Siligardi Cristina	CO-2:IL01
Silvestroni Laura	CD-4:IL03
Sivula Kevin	CF-3:IL02
Smektala Frédéric	CL-3:IL05
Smirnov Aliaksandr	C:P50
Smith David S.	CO-4:IL06
Snyder Joshua	CE-6:IL01
Sobolev Kirill	CE-2:L09
Sobrados de la Plaza Isabel	CN-4:IL06
Sokol Maxim	CE-4:IL02
Solarska Renata	CF-2:IL06
Son Dong Ick	C:P35
Soria Huguet Silvia	CL-1:IL04
Sorokin Pavel	CG-2:IL06
Sousa Vania	CA-10:L08
Speranza Giorgio	CL-6:IL02
Spiridigliozzi Hugo	CA-5:L08
Spreitzer Matjaz	CI-2:IL04
Srivastava Ankit	CE-3:L05
Stalin S.	CA-12.2:L08
Stangl Alexander	CK-2:L09
Steinbrück Martin	CD-2:IL02
Stiller Jonas	CQ-3:L08
Storti Enrico	CP-6:L07
Striccoli Marinella	CL-1:L06
Suchomel Matthew	CI-2:IL02
Sugahara Yoshiyuki	CA-7:IL01
Sugimoto Wataru	CJ-2:IL03
Suhir Ephraim	CL-7:L07
Suhonen Tomi	CG-3:IL12
Sun ZhengMing	CE-6:IL05
Sundaram S.K.	CL-7:IL05
Sunko Denis	CR-3:IL07
Surzhikov Anatoliy	C:P02
Suzuki Tohru S.	CA-1:IL04
Sychov Maxim	CA-4:L05
Tabis Wojciech	CR-3:IL06
Taira Hatsuo	CP-1:IL02
Takeuchi Ichiro	CB-1:IL01
Talimian Ali	CA-7:L08
Tanaka Isao	CB-1:IL03
Tang Dingyuan	CL-3:IL04
Taniguchi Takashi	CA-1:IL03
Taskiran Fahriye	CO-3:L06
Tassot Patrick	CP-6:IL03
Tatami Junichi	CC-1:IL03
Tatarko Peter	CD-3:IL03
Teng Hsisheng	CJ-1:IL18
Tessier-Doyen Nicolas	CO-3:IL03
Texier Mandoki Nathalie	CN-3:IL05
Thöming Jorg	CH-5:IL02
Titova Lyubov	CE-5:IL02
Tochigi Eita	CC-1:IL11
Toci Guido	CL-3:L06
Tognonvi Monique	CN-1:IL11
Tokudome Yasuaki	CH-1:IL08
Tolj Davor	CR-2:IL02
Tomoshige Ryuichi	CA-11.3:IL02
Torkamanzadeh Mohammad	CE-7:L01
Tosi Daniele	CL-7:IL01
Trabesinger Sigita	CJ-1:IL25
Traversa Enrico	CK-2:IL03
Trunec Martin	CA-1:L11
Tsipas Sophia	CE-2:L08
Tulliani Jean-Marc	CA-6:IL01

Uehara Masato CI-2:IL18
Urbánek Jan CN-3:L03
Valenza Fabrizio CA-12.2:IL01
Van Benthem Klaus CA-12.1:IL01
Van De Walle Chris G. CM-1:IL07
Varisli Suleyman Onder CO-2:L06
Vasić Milica CO-1:IL02
Vassen Robert CG-4:IL03
Vayssieres Lionel CF-2:IL08
Venkatachalam Vinothini CD-1:IL05
Vereschaka Alexey CG-2:L03
Vignoles Gerard L. CB-2:KL1
CQ-5:IL03
Vilarinho Ines CO-1:L03
Villalba Weinberg Adrian CP-6:IL10
Vladikova Daria CK-3:IL02
Vleugels Jef CE-1:IL02
Voevodin Andrey A. CG-2:IL10
Volkov Alexey N. CH-5:L04
Vomiero Alberto CF-2:IL07
Von Wenckstern Holger CM-2:IL11
Vona Danilo CA-9:L09
Vorotilo Stepan CA-11.1:L04
Vorotilov Konstantin CI-2:L12
Wachsman Eric CK-2:IL07
Wada Hiroyuki CA-11.2:IL02
Wada Satoshi CI-2:IL03
Walkley Brant CN-1:IL01
Wang Chang-An CH-3:IL04
Wang Hong CI-1:IL03
Wang Jian CC-3:L03
Wang Jingwen CF-1:L11
Wang Jingyang CC-2:IL04
Wang Junjie CE-1:IL06
Wang Yaojin CI-2:IL19
Wang Yuqing CK-5:IL06
Warmuz Karina CP-2:L03
Watanabe Yoshimi CA-10:L07
Webber Kyle CI-2:IL01
Wei Jiake CC-1:IL17
Wei John CR-5:IL01
Weil Marcel CJ-1:IL02
Weinberger Christopher R. CD-4:IL04
Westin Gunnar CF-1:IL01
Wiedwald Ulf CE-2:L05
Wilhelm Michaela CH-2:IL03
Wilkinson James S. CL-5:IL01
Wöhrmeyer Christoph CP-1:IL01
Wójcik Marek CE-5:L05
Wollmershauser James A. CC-1:IL04
Wolverton Chris CB-1:KL1
Wu Maw-Kuen CR-1:IL03
Wu Nae-Lih Nick CJ-1:IL06
Wu Yiquan CL-1:IL01
Xiao Ping CG-4:IL06
Xin Yunzi C:P12
Xu Yuping CL-1:L07
Yager Riley CH-3:L03
Yahiro Hidenori CA-7:L09
Yamamoto Tetsuya CI-4:IL04
Yamanaka Riyo CA-11.4:IL01
Yamazaki Shunpei C:PL3
Yang Chang CM-1:IL06
Yang Chun-Chen CJ-1:IL19
Yang Guan-Jun CC-2:IL01
Yang Jianfeng CC-1:IL06
Yao Xin CR-5:IL03
Yerokhin Aleksey CG-1:L05
Yin Shu CA-2:IL02
Ying Guobing CE-4:IL06
Yoshimura Masahiro CA-2:IL01
Youmoue Martine CN-1:L09
Yukhvid Vladimir CA-11.3:IL05
Zakaryan Marieta CA-11.2:L04
Zanelli Chiara CO-1:L04
Zanotto Edgar D. CB-1:IL05
Zeng Yuping CH-1:IL09
Zhang Pei C:P25
Zhang Shaowei CP-5:IL04
Zhang Shujun CI-2:IL16
Zhao Guo-meng CR-5:IL06
Zhou Aiguo CE-2:IL03
Zhou Xiao-Dong CK-1:IL01
Zhou Xingjiang CR-1:IL04
Zhu Wanlin CI-2:IL09
Zhuang Wyman CD-3:L04
Ziberna Katarina C:P45
Zok Frank CQ-4:IL01
Zoli Luca CD-1:IL07
Zou Xinshu CE-2:L11
Zuber Axel CE-3:L09
Zukalova Marketa CJ-1:L20
Zürn Martin C:P07

Scientific Programme

15th INTERNATIONAL CERAMICS CONGRESS

OPENING SESSION

WELCOME ADDRESSES

Plenary Lectures

C:PL1 **High-Pressure Materials Synthesis - A Guideline for the Discovery of Advanced Ceramic Nitrides**
R. RIEDEL, Department of Dispersive Solids, Institute of Materials Sciences, Technical University of Darmstadt, Darmstadt, Germany *(World Academy of Ceramics Prize Laureate Lecture)*

C:PL2 **Removing Roadblocks and Opening New Opportunities for MXenes**
M.W. BARSOUM[1], **Y. GOGOTSI**[1, 2], [1]Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA; [2]A.J. Drexel Nanomaterials Institute, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA *(World Academy of Ceramics Prize Laureates Lecture)*

C:PL3 **C-Axis Aligned Crystalline Indium-Gallium-Zinc Oxide Ceramics and Oxide Semiconductor LSI as Countermeasures against Global Warming**
SHUNPEI YAMAZAKI, K. KATO, T. ONUKI, D. SHIMADA, H. KIMURA, F. ISAKA, R. HODO, H. BABA, T. NAKAYAMA, H. KUNITAKE, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Kanagawa, Japan

SYMPOSIUM CA

ADVANCES IN PROCESSING SCIENCE AND MANUFACTURING OF HIGH PERFORMANCE CERAMICS AND COMPOSITES

Session CA-1

Advances in conventional powder processing routes

CA-1:IL01 **Full Densification in Sintering, how can we achieve it?**
SUK-JOONG L. KANG, KAIST, Daejeon, South Korea

CA-1:IL02 **Transparency in Polycrystalline Ceramics: Trivial Process or Nightmare?**
A. LERICHE, Y. LORGOUILLOUX, LMCPA - UPHF, Valenciennes, France; J. BOEHLMLER, S. LEMONNIER, ISL, St Louis, France

CA-1:IL03 **High Pressure Synthesis of Boron Nitride Crystals: expected functions via impurity and isotope control**
T. TANIGUCHI, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

CA-1:IL04 **Microstructure Control in Ceramics by External Field**
T.S. SUZUKI, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

CA-1:IL05 **Towards High-performance all Solid State Batteries: Where Processing Comes into Play**
O. GUILLON, Forschungszentrum Jülich GmbH, IEK-1, Jülich, Germany

CA-1:L06 **A Comprehensive Approach to Ceramic Forming Processes**
W.M. CARTY, Alfred University, Alfred, NY, USA

CA-1:L07 **Efficient Optimization of Debinding Processes**
H. FRIEDRICH, H. ZIEBOLD, F. RAETHER, Fraunhofer ISC, Zentrum für Hochtemperatur-Leichtbau HTL, Bayreuth, Germany

CA-1:L08 **Rheological and Debinding Properties of Boron Carbide Powder Injection Molding Feedstock**
S. BILKETAY, **H.O. GULSOY**, Marmara University, Technology Faculty, Metall. and Mater. Eng., Istanbul, Turkey

CA-1:L09 **Injection Molded, Platelet Reinforced, Zirconia Toughened Alumina for Joint Arthroplasty**
M. FERSINI, V. CONTALDI, Salentec srl, Lecce, Italy; A. LICCIULLI, A.R. TERRIZZI, S.K. SANOSH, Innovation Engineering Department, Unisalento, Lecce, Italy

CA-1:L10 **Improved Sintered Density at reduced Sintering Temperature: New Ceramic Body for 99,8%-Al_2O_3 Engineering Ceramics from Nabaltec AG**
A. BIEGERL, Nabaltec AG, Schwandorf, Germany

CA-1:L11 **Inherent Problems in Sintering of Zirconia Nanoparticle Compacts**
M. TRUNEC, J. KASTYL, J. CIHLAR, CEITEC BUT, Brno University of Technology, Brno, Czech Republic

CA-1:L12 **Study of Matrix Growth Mechanisms during the Injection and Filtration Process of Ceramic Suspensions into a Ceramic Matrix Composite Preform (CMC)**
N. EBERLING-FUX, Safran Ceramics, Merignac, France

CA-1:L13 **The Influence of Carbon on the Microstructure and Wear Resistance of Alumina**
R. MARDER[1], LI-OR COHEN[1], P. GHOSH[1], I. REIMANIS[2], W.D. KAPLAN[1], [1]Department of Materials Science and Engineering, Technion – Israel Institute of Technology, Haifa, Israel; [2]Colorado Center for Advanced Ceramics, Metallurgical and Materials Engineering Department, Colorado School of Mines, USA

CA-1:L14 **Three Sustainable Polypropylene Surface Treatments for the Compatibility Optimization of PP Fibers and Cement Matrix in Fiber Reinforced Concretes**
B. MALCHIODI, P. POZZI, C. SILIGARDI, University of Modena and Reggio Emilia, Department of Engineering Enzo Ferrari, Modena, Italy

Session CA-2

Solution-based processing of functional materials

CA-2:IL01 **Powder-Less Processing of Nano-structured Ceramics: Possible Fabrication of Various Advanced Ceramics from Solutions and/or Melts**
MASAHIRO YOSHIMURA, Visiting Distinguished Chair Professor: National Cheng Kung University, Tainan,Taiwan; Professor Emeritus, Tokyo Institute of Technology,Tokyo, Japan

CA-2:IL02 **Fabrication of Advanced Photocatalyst by Solution Process**
SHU YIN, TAKUYA HASEGAWA, IMRAM, Tohoku University, Sendai, Miyagi, Japan

Session CA-3

Polymer-derived ceramics

CA-3:IL01 **Characteristics of Si-B-C-N-based Ceramics**
R. RIEDEL, Materials Science, TU Darmstadt, Germany

CA-3:IL02 **Chemistry and Processability of Preceramic Polymers Towards Advanced Functional Ceramics**
M. BALESTRAT, A. LALE, **S. BERNARD**, Institute of Research on Ceramics-CNRS/University of Limoges, Limoges, France

CA-3:IL03 **Evolution of Transient Microporosity in Polymer-derived Ceramics: in-situ Monitoring and Tailoring**
T. KONEGGER, C. DRECHSEL, TU Wien, Institute of Chemical Technologies and Analytics, Wien, Austria; H. PETERLIK, University of Vienna, Vienna, Austria

CA-3:L04 **Preparation of Photocurable Materials for Digital Light Processing 3D Printing of Al_2O_3 Structures**
I. RUTKOWSKA, P. BEZKOSTY, J. MARCHEWKA, M. SITARZ, Faculty of Material Science and Ceramics, AGH University of Science and Technology, Krakow, Poland

CA-3:IL05 **Ceramic Nanocomposites from Tailor-made Preceramic Polymers**
G. MERA, TU Darmstadt, Darmstadt, Germany

CA-3:L06 **In-Silico Simulations of Polymer Pyrolysis**
P. KROLL, The University of Texas at Arlington, Arlington, TX, USA

CA-3:L07 **Development of a New Binder System for Polymer Derived Mullite Ceramics Made by Fused Deposition Modeling (FDM) Technique**
F. SARRAF[1, 2], F. CLEMENS[1], S.V. CHURAKOV[2], [1]Empa – Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzlerland; [2]University of Bern, Bern, Switzerland

CA-3:L08 **Metal-modified Polymer-derived Ceramics for Stereolithography-based Fabrication of Catalyst Carrier Structures**
J. ESSMEISTER, L. SCHACHTNER, K. FÖTTINGER, G. PACHOLIK, T. KONEGGER, TU Wien, Vienna, Austria

Session CA-4
Microwave processing

CA-4:IL01 **Process Control during Microwave Sintering: From Magnetron to Solid-State Radio Frequency Source**
T. GARNAULT[1,2], **S. MARINEL**[2], D. BOUVARD[1], J.-M. CHAIX[1], C. HARNOIS[2], C. MANIÈRE[2], G.L KERBART[2], [1]Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMaP, Grenoble, France; [2]Laboratoire de Cristallographie et Sciences des Matériaux, Normandie Univ, ENSICAEN, UNICAEN, CNRS, CRISMAT, Caen, France

CA-4:IL02 **Microwave Ultra-rapid Sintering of Ceramics**
K.I. RYBAKOV, YU.V. BYKOV, S.V. EGOROV, A.G. EREMEEV, V.V. KHOLOPTSEV, I.V. PLOTNIKOV, A.A. SOROKIN, Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia

CA-4:IL03 **Materials Processing under Non-equilibrium Reaction Field Induced by Microwave Irradiation**
JUN FUKUSHIMA, H. TAKIZAWA, Dept. of Appl. Chem., Tohoku University, Sendai, Miyagi, Japan

CA-4:IL04 **Breaking the Stability Threshold of Microwave Sintering: From the Multiphysics Simulation to Advanced Sintering Approaches**
C. MANIERE[1], G. LEE[2,3], S. CHAN[2], E. TORRESANI[2], E.A. OLEVSKY[2,3], S. MARINEL[1], [1]CRISMAT, CNRS, ENSICAEN, UNICAEN, Normandie Univ, France; [2]Powder Technology Laboratory, Department of Mechanical Engineering, San Diego State University, San Diego, CA, USA; [3]Department of NanoEngineering, University of California, San Diego, La Jolla, CA, USA

CA-4:L05 **Enhanced Luminescence of ZrO2-Eu3+ Material by Microwave Treatment and Ca Cooping**
M.M. SYCHOV, M.V. KESKINOVA, I.A. TURKIN, St. Petersburg Institute of Technology, St. Petersburg, Russia

CA-4:L06 **Flash Microwave Sintering of Zirconia**
G. RIQUET, C. HARNOIS, S. MARINEL, C. MANIÈRE, Normandie Université, ENSICAEN, UNICAEN, CNRS UMR 6508, CRISMAT, Caen, France

Session CA-5
Novel sintering approaches

CA-5:IL02 **From Flash Sintering to Ultrafast Sintering without Electric Fields and Electrochemically Controlled Microstructural Evolution**
JIAN LUO, University of California, San Diego, la Jolla, CA, USA

CA-5:IL03 **Flash Electrical Resistance Sintering of Tungsten Carbide**
V.M. SGLAVO, I. MAZO, University of Trento, Department of Industrial Engineering, Trento, Italy

CA-5:IL04 **Integrated 3D-Printing and Spark Plasma Sintering**
E.A. OLEVSKY, San Diego State University, San Diego, CA, USA

CA-5:IL05 **Characterization of Nanostructured Zirconia-scandia Ceramics Consolidated by High Pressure Spark Plasma Sintering**
E.N.S. MUCCILLO, Center of Materials Science and Technology Energy and Nuclear Research Institute, S. Paulo, Brazil

CA-5:IL06 **Impact of Electric Fields on Microstructure Evolution in Functional Oxides**
W. RHEINHEIMER, FZ Jülich, Germany; RWTH Aachen University, Germany; Karlsruhe Institute of Technology, Germany; TU Darmstadt, Germany ; Purdue University, Germany

CA-5:L07 **Flash Spark Plasma Sintering on 3YSZ: Modification of Sintering Trajectories and Influence on the Formation of Grain Boundaries**
T. HERISSON DE BEAUVOIR[1], A. FLAUREAU[1], G. CHEVALLIER[1], A. WEIBEL[1], C. ELISSALDE[2], F. MAUVY[2], R. CHAIM[3], **C. ESTOURNES**[1], [1]CIRIMAT, CNRS-INP-UPS, Université Toulouse 3 - Paul Sabatier, Toulouse, France; [2]CNRS, Université de Bordeaux, ICMCB, UMR 5026, Pessac, France; [3]Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa. Israel

CA-5:L08 **Parametric Study of Spark Plasma Sintering of Optically Transparent Fine-grain MgAl2O4 Ceramics: Influence of Precursor Powder and Sintering Conditions**
H. SPIRIDIGLIOZZI, A. KANAEV, F. SCHOENSTEIN, Université Paris 13, Sorbonne Paris Cité, Laboratoire de Sciences des Procédés et des Matériaux, CNRS UPR-3407, Villetaneuse, France

CA-5:L09 **Investigation of Electrical Transitions in the First Steps of Spark Plasma Sintering: Effects of Pre-oxidation and Mechanical Loading within Copper Granular Media**
A. ALIOUAT, G. ANTOU, V. RAT, N. PRADEILLES, A. MAÎTRE. Institut de Recherche sur les Céramiques (IRCER), Limoges, France

CA-5:L10 **Supercrystalline Nanocomposites: New Hybrid Materials with Mechanical Robustness and Controlled Magnetic Behavior**
D. GIUNTINI[1, 2], E. TORRESANI[3], K. CHAN[4], B. BOR[2], B. DOMENECH[2], L. SAVIOT[5], M. SHACHAR[4], M. BLANKENBURG[6], M. MUELLER[6], J.E. GARAY[4], E.A. OLEVSKY[3], G.A. SCHNEIDER[2], [1]Eindhoven University of Technology, The Netherlands; [2]Hamburg University of Technology, Germany; [3]San Diego State University, USA; [4]University of California, San Diego, USA; [5]Laboratoire Interdisciplinaire Carnot de Bourgogne, UMR 6303 CNRS-Université Bourgogne Franche-Comté, France; [6]Helmholtz-Zentrum Geesthacht, Germany

CA-5:L11 **Sintering of Lead-free Functional Perovskites by Cool-SPS**
L. FAURE, U-C. CHUNG, F. MOLINARI, M. SUCHOMEL, M. MAGLIONE, M. JOSSE, ICMCB-UB-CNRS, UMR5026, Pessac, France

CA-5:L12 **Super-hard B6C Ceramics Fabricated through the Laser-floating Zone Method**
B.M. MOSHTAGHIOUN, D. GOMEZ GARCIA, F.L. CUMBRERA, Department of Condense Matter Physics, CSIC-University of Seville, Seville, Spain; J.I. PEÑA, Institute of Materials Science of Aragon, CSIC-University of Zaragoza, Zaragoza, Spain

CA-5:L13 **Developing in situ Characterization of Cold Sintering Process Mechanisms by Impedance Spectroscopy Measurements**
T. HERISSON DE BEAUVOIR, P-L. TABERNA, P. SIMON, C. ESTOURNÈS, CIRIMAT, Université de Toulouse, CNRS, Université Toulouse 3 - Paul Sabatier, Toulouse, France

Session CA-6
Additive manufacturing

CA-6:KL **Multi Materials Additive Manufacturing**
A. MICHAELIS, Fraunhofer Institute of Ceramic Technologies and Systems, IKTS, Dresden, Germany

CA-6:IL01 **3D Printing of Composite Ceramics: Advances and Issues Compared to Traditional Manufacturing**
B. INSERRA, B. COPPOLA, L. MONTANARO, P. PALMERO, **J.M. TULLIANI**, Politecnico di Torino, Department of Applied Science and Technology (DISAT), INSTM R.U. PoliTO, Torino, Italy

CA-6:L02 **3D Printed Tialite by New Pastes as Raw Materials for LDM Technique**
F. BEZZI, P. FABBRI, E. SALERNITANO, M. SCAFÈ, A. STRAFELLA, G. MAGNANI, ENEA SSPT-PROMAS-TEMAF, Laboratory of Materials Technologies Faenza, Faenza (RA), Italy

CA-6:IL03 **Sinter-cracking and Distortion Behaviors of Sintering 3D Printed Ceramics**
Z. CORDERO, Department of Aeronautics and Astronautics, MIT, Cambridge, MA, USA

CA-6:L04 **A Colloidal Approach for the Fused Filament Fabrication: Multimaterial 3D Printing**
B. FERRARI, A. EGUILUZ, P. ORTEGA, O. URRA, J. YUS, A. FERRANDEZ-MONTERO, A.J. SANCHEZ-HERENCIA, Instituto de Ceramcia y Vidrio, CSIC, Madrid, Spain

CA-6:L05 **Comparison of Thermoplastic Material Extrusion-based Additive Manufacturing Methods for the Shaping Ceramic Materials**
F. CLEMENS, Empa, Dübendorf, Switzerland

CA-6:L06 **The Curing Performance of an Acrylate Resin Highly Loaded with an Ultraviolet (UV) Absorbing Ferrite Powder**
A. HARMON, M. ROUMANIE, U. SOUPREMANIEN, Univ Grenoble Alpes CEA LITEN DTNM, Grenoble, France; D. AUTISSIER, CEA Le Ripault, Monts, France

CA-6:IL07 **Selection of Surfactants for Lithography Based Shaping of Zirconia and Zirconia/Alumina Nanocomposites**
T. GRAULE[1], P. ZUBRZYCKA[1], P. OZOG[2], L. CONTI[1], M. BORLAF[1], D. KATA[2], M. RADECKA[2], [1]Empa, Swiss Laboratories for Materials Science and Technology, Laboratory for High Performance Ceramics, Dübendorf, Switzerland; [2]AGH Krakow, Krakow, Poland

CA-6:IL08 **Influence of the Polymerization on Mechanical Properties of Ceramic Parts Produced by Stereolithography**
V. PATELOUP, T. CHARTIER, P. MICHAUD, M. BERNARD, J. RAYNAUD, J. TARABEUX, Institute of Research for Ceramics, CNRS-University of Limoges, Limoges, France

CA-6:L09 **Reaction-diffusion Synthesis of Diamond-SiC Composites**
V.YA. SHEVCHENKO, S.N. PEREVISLOV, M.M. SYCHOV, Institute of Silicate Chemistry, NRC «Kurchatov Institute» - CRISM "Prometey", St. Petersburg, Russia

CA-6:L10 **Hybrid Additive Manufacturing for the Fabrication of Free-form Ceramic Components**
A. DE MARZI, G. GIOMETTI, P. COLOMBO, G. FRANCHIN, Department of Industrial Engineering, Università degli Studi di Padova, Padova, Italy

CA-6:L11 **Comparing the Strength of Zirconia Disks Produced using Material Extrusion Additive Manufacturing and Cold Pressing**
A. HADIAN, F. CLEMENS, Empa, Dübendorf, Switzerland; M. FRICKE, A. LIERSCH, Hochschule Koblenz, Höhr-Grenzhausen, Germany

CA-6:L12 **Large Scale Additive Manufacturing of Artificial Stone**
F. GOBBIN[1, 2], H. ELSAYED[1, 3], J. ADRIEN[4], G. FRANCHIN[1], A. ITALIANO[2], E. MAIRE[4], P. COLOMBO[1, 5], [1]University of Padova, Industrial Engineering Department, Padova, Italy; [2]Desamanera Srl, Rovigo, Italy; [3]Ceramics Department, National Research Centre, Cairo, Egypt; [4]Université de Lyon, INSA de Lyon, MATEIS CNRS UMR5510, Villeurbanne Cedex, France; [5]Department of Materials Science and Engineering, Pennsylvania State University, University Park, PA, USA

Session CA-7
Other special processing routes

CA-7:IL01 **Janus Nanosheets based on Niobate Nanosheets via Regioselective Surface Modification of Layered Potassium Hexaniobate**
YOSHIYUKI SUGAHARA, Department of Applied Chemistry and Kagami Memorial Institute for Materials Science and Technology, Faculty of Science and Engineering, Waseda University, Tokyo, Japan

CA-7:IL02 **Ceramics with Eutectic Microstructure by Viscous Flow Sintering and Controlled Crystallization of Al2O3-Y2O3 and Al2O3-Y2O3-ZrO2 Glass**
D. GALUSEK, Centre for Functional and Surface Functionalized Glass, Alexander Dubček University of Trenčín, Trenčín, Slovakia

CA-7:IL03 **Fibrous Nanoparticle Compacts for Thermal Insulation by Particle Bonding Technology**
MAKIO NAITO, TAKAHIRO KOZAWA, AKIRA KONDO, JWRI, Osaka University, Ibaraki City, Japan

CA-7:L04 **Optical in-Line 3D-Quality Inspection Using White-Light Interferometry for CMC Aerospace Applications**
J. MACKEN, R. GOLLER, Augsburg University of Applied Sciences, Department of Mechanical and Process Engineering, Augsburg, Germany

CA-7:IL05 **A Practical Overview of Colloidal Strategies to Manufacture ad-hoc Designs of Advanced 2D and 3D Structures**
Z. GONZALEZ[1, 2] J. YUS[1], E. USALA[2], P. ORTEGA-COLUMBRANS[1], E. ESPINOSA[2], A. RODRÍGUEZ[2], A.J. SANCHEZ-HERENCIA[1], B. FERRARI[1], [1]Instituto de Ceramica y Vidrio (ICV), CSIC, Madrid, Spain; [2]BioPren Group. Chemical Engineering Department, Faculty of Science, Campus de Rabanales, Universidad de Cordoba, Cordoba, Spain

CA-7:IL06 **Applications of Electrospray Techniques for Ceramics Manufacturing Processes**
TEIICHI KIMURA, S. SUEHIRO, Japan Fine Ceramics Center, Nagoya, Japan

CA-7:L07 **Novel Entropy-stabilized Ni-free Rock Salt Ceramics**
M. BIESUZ, V.M. SGALVO, University of Trento, Department of Industrial Engineering, Trento, Italy

CA-7:L08 **Improving Mechanical Properties of Laminated Transparent Ceramics by Engineering Residual Stress Profiles**
A. TALIMIAN, D. GALUSEK, Centre for Functional and Surface Functionalised Glass, A. DUBCEK, University of Trencin, Trencin, Slovakia; A. NAJAFZADEH, Joint Glass Centre of the IIC SAS, TnUAD and FChPT STU, Trencin, Slovakia; V. POUCHLY, K. MACA, CEITEC BUT, Brno University of Technology, Brno, Czech Republic

CA-7:L09 **Preparation of Perovskite-type Oxide Catalyst by Thermal Decomposition of Heteronuclear Cyano-complex Precursor**
H. YAHIRO, H. YAMAURA, S. YAMAGUCHI, Department of Materials Science and Biotechnology, Graduate School of Science and Engineering, Ehime University, Matsuyama, Japan

Focused Session CA-9
BIO-INSPIRED AND BIO-ENABLED PROCESSING

CA-9:IL01 **Ceramic Inverse-Opal Structures for Photonic and Catalytic Applications**
J. AIZENBERG, Harvard University, Cambridge, MA, USA

CA-9:IL02 **Genetically Programmed Regioselective Immobilization of Enzymes in Biosilica Microparticles**
E. KUMARI, S. GÖRLICH, N. POULSEN, **N. KRÖGER**, B CUBE Center for Molecular Bioengineering, TU Dresden, Dresden, Germany

CA-9:IL03 **Bioinspired Ceramics in Architecture**
M. BECHTHOLD, J. GRINHAM, J.-P. UGARTE, Harvard University, Graduate School of Design, Cambridge, MA, USA

CA-9:IL04 **Low Temperature Processing of Biomimetic Apatite-based Bioceramics**
C. REY, C. DROUET, S. CAZALBOU, D. GROSSIN, S. SARDA, J. SOULIÉ, G. BERTRAND, **C. COMBES**, CIRIMAT, Université de Toulouse, UPS, CNRS, INP ENSIACET, Toulouse, France

CA-9:IL05 **Mechanical Effects in Evaporation-induced Colloidal Crystals: Crystallographically Preferred Growth and Fracture**
LING LI, Department of Mechanical Engineering, Virginia Tech, Blacksburg, VA, USA

CA-9:IL06 **Multishell Calcium Phosphate Nanoparticles for Gene and Drug Delivery, Immunostimulation and Imaging**
M. EPPLE, University of Duisburg-Essen, Essen, Germany

CA-9:IL07 **Functional ceramic and composite materials for micro-biological fuel cells**
O.A. SHILOVA[1,2], A.G. IVANOVA[1], O.A. ZAGREBELNYY[1], M.S. MASALOVICH[1], A.S. GALUSHKO[1,3], G.G. PANOVA[3], I.YU.KRUCHININA[1,2], [1]Institute of Silicate Chemistry of Russian Academy of Sciences, Saint-Petersburg, Russia; [2]Saint Petersburg State Electrotechnical University "LETI", Saint-Petersburg, Russia; [3]Agrophysical Research Institute, Saint-Petersburg, Russia

CA-9:IL08 **Biomimetic Spider Silk Fibres: From Vision to Reality**
T. SCHEIBEL, Department of Biomaterials, Faculty of Engineering Science, University of Bayreuth, Bayreuth, Germany

CA-9:L09 **Biohybrids From Microalgae: A New Generation Material**
D. VONA[1], R. RAGNI[1], S.R. CICCO[2], C.V. GARCIA[1], G.M. FARINOLA[1], [1]Dipartimento di chimica, Università degli Studi di Bari "Aldo Moro", Bari, Italy; [2]Istituto per la chimica dei composti organometallici (CNR-ICCOM)-Bari, Italy

CA-9:L10 **Bioinspired Multi-doped Ca10-x/2-a-bMgaCub(PO4)6-x-y(CO3)x(SiO4)y(OH)2-y Ceramic Prepared via Nano-emulsion Route**
E. ILIYA[1, 2], R.K. SHAH[1], B.I. YANNY MARLIANA[1], M.N. AHMAD-FAUZI[1], [1]School of Applied Science and Technology, Department of Ceramic Technology, Federal Polytechnic Auchi, Edo State, Nigeria; [2]School of Materials & Mineral Resources Engineering, University Sains Malaysia, Engineering Campus, Nibong Tebal, Penang, Malaysia

Focused Session CA-10
FUNCTIONALLY INORGANIC GRADED MATERIALS

CA-10:IL01 **Configuration Design and Converting Performance of Multifunctional Coating**
DANDAN QU, KUN ZHANG, GUOLIANG LIU, ZHANGJIAN ZHOU, Institute of Mechanics, CAS, University of Science and Technology Beijing, Beijing, China

CA-10:IL02 **Effective Analytical Model for Analysis of Indentation Experiments of Coated Materials**
S.M. AIZIKOVICH, A.S. VASILIEV, E.V. SADYRIN, Research and Education Center "Materials", Don State Technical University, Rostov-on-Don, Russia

CA-10:IL03 **Effect of Nb and Ta Addition on the Exfoliation Strength of Oxide Layer on Ti Alloys formed by High Temperature Oxidation**
Y. OGAWA, K. HARADA, W. NAKAGAWA, **E. MIURA-FUJIWARA**, Graduate School of Engineering, University of Hyogo, Hyogo, Japan

CA-10:IL04 **Drilling CFRP Laminates by Functionally Graded Materials**
TAKAHIRO KUNIMINE, Kanazawa University, Kanazawa, Ishikawa, Japan; Y. WATANABE, Nagoya Institute of Technology, Nagoya, Aichi, Japan

CA-10:L05 **Functionally Graded MAX-phase Based Composites Fabricated from Preceramic Papers**
D.G. KROTKEVICH, E.B. KASHKAROV, A.M. LIDER, Division for Experimental Physics, School of Nuclear Science & Engineering, National Research Tomsk Polytechnic University, Tomsk, Russian Federation; N. TRAVITZKY Department of Materials Science, Glass and Ceramics, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany and Division for Materials Science, School of Advanced Manufacturing Technologies, National Research Tomsk Polytechnic University, Tomsk, Russian Federation

CA-10:L06 **Nano-Mullite/ nano-SiC Gradient Coating on C-C Composite by EPD for Simultaneous Anti-oxidation and TBC Applications**
M.S. SHAKERI, Z. SWIATKOWSKA-WARKOCKA, Institute of Nuclear Physics Polish Academy of Sciences, Krakow, Poland

CA-10:L07 **Formation of Graded TiO2 Layer on Ti Wire by Direct Alternating Current Discharge Plasma at Atmospheric Pressure**
YOSHIMI WATANABE[1], N. MITSUISHI[1], M. YAMADA[1], H. SATO[1], S. TAKASHIMA[2], E. MIURA-FUJIWARA[3], [1]Graduate School of Engineering, Nagoya Institute of Technology, Nagoya, Aichi, Japan; [2]Nagoya Industries Promotion Corporation, Nagoya, Aichi, Japan; [3]University of Hyogo, Himeji, Hyogo, Japan

CA-10:L08 **Mono Solid Oxide Fuel Cell Based on Calcium Aluminate obtained by Functionally Gradient Materials Process**
V.C. SOUSA[1], F.C.T. VEIGA[1], J.J. EGEA[2], S.S. CAVA[3], [1]UFRSG/PPGE3M/LABCAV, Porto Alegre, RS, Brazil; [2]CSIC/ UFRSG-(CNPQ/ Research PVE), Brazil; [3]UFPEL/CCAF, Brazil

Focused Session CA-11
SHS CERAMICS

Session CA-11.1
Theory and modeling of SHS

CA-11.1:IL01 **Theory and Modelling of SHS Processes and Structural Transformations**
F. BARAS, O. POLITANO, Laboratoire ICB CNRS-Université de Bourgogne, Dijon, France

CA-11.1:IL02 **Thermodynamics of SHS Revisited: Application of the CALHAD Approach**
B.B. KHINA, Physicotechnical Institute, National Academy of Sciences of Belarus, Minsk, Belarus

CA-11.1:IL03 **Large-scale Molecular Dynamics Simulations of SHS Processes in Nanocomposites**
O. POLITANO[1], A.S. ROGACHEV[2], F. BARAS[1], [1]Laboratoire Interdisciplinaire Carnot de Bourgogne, UMR 6303 CNRS-Université de Bourgogne Franche-Comté, Dijon, France; [2]Merzhanov Institute of Structural Macrokinetics and Materials Science (ISMAN), Chernogolovka, Russia

CA-11.1:L04 **A New Comprehensive Approach to the Investigation of Combustion Synthesis Processes**
S. VOROTILO, E.A. LEVASHOV, The National University of Science and Technology "MISiS", Moscow, Russia

CA-11.1:L05 **Reactivity of Ti-Al Laminated Particles : Experimental and Molecular Dynamics Studies**
Q. BIZOT, O. POLITANO, F. BARAS, Laboratoire Interdisciplinaire Carnot de Bourgogne, UMR 6303 CNRS-Université de Bourgogne Franche-Comté, Dijon, France; A.A. NEPAPUSHEV, Center of Functional Nano-Ceramics, National University of Science and Technology MISiS, Moscow, Russia; S.G. VADCHENKO, Merzhanov Institute of Structural Macrokinetics and Materials Science (ISMAN), Chernogolovka, Russia; A.S. ROGACHEV, Center of Functional Nano-Ceramics, National University of Science and Technology MISiS, Moscow, Russia and Merzhanov Institute of Structural Macrokinetics and Materials Science (ISMAN), Chernogolovka, Russia

Session CA-11.2
SHS of powders and consolidation

CA-11.2:IL01 **Metal Matrix Composites by SPS and Reactive SPS**
D.V. DUDINA[1, 2, 3], T.M. VIDYUK[2, 4], M.A. KORCHAGIN[2, 3], A.I. GAVRILOV[2], A.G. ANISIMOV[1], V.I. MALI[1], M.A. ESIKOV[1], A.V. UKHINA[2], B.B. BOKHONOV[2], [1]Lavrentyev Institute of Hydrodynamics SB RAS, Novosibirsk, Russia; [2]Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia; [3]Novosibirsk State Technical University, Russia; [4]Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Novosibirsk, Russia

CA-11.2:IL02 **Spherical Nitride Nanoparticles Synthesized by Laser Melting in Liquid**
HIROYUKI WADA, K. KAWASOE, T. YOSHIDA, H. KODAMA, A. GUBAREVICH, O. ODAWARA, Tokyo Institute of Technology, Yokohama, Japan

CA-11.2:L03 **SHS-derived Powders Obtained by Coupled Reactions and Thermal Dilution for Subsequent Consolidation**
S. AYDINYAN, I. HUSSAINOVA, S. KHARATYAN, A.B. Nalbandyan Institute of Chemical Physics, Yerevan, Armenia and Tallinn University of Technology, Tallinn, Estonia

CA-11.2:L04 **Combustion Synthesis of Nanoscale Boron and Silicon Carbides**
M. ZAKARYAN[1], N. AMIRKHANYAN[1], H. KIRAKOSYAN[1], A. ZURNACHYAN[1], S. AYDINYAN[1, 2], [1]A.B. Nalbandyan Institute of Chemical Physics, Yerevan, Armenia; [2]Tallinn University of Technology, Tallinn, Estonia

CA-11.2:L05 **Solution Combustion Synthesis and Spark Plasma Sintering of Magnetic High Entropy Materials**
H. KIRAKOSYAN[1], A. SARGSYAN[1], S. AYDINYAN[1, 2], S. KHARATYAN[1], [1]A.B. Nalbandyan Institute of Chemical Physics, Yerevan, Armenia; [2]Tallinn University of Technology, Tallinn, Estonia

CA-11.2:IL06 **SHS High-entropy Ceramics**
R. ORRU'[1], S. BARBAROSSA[1], M. MURGIA[1], R. LICHERI[1], S. GARRONI[2], G. CAO[1], [1]Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università degli Studi di Cagliari, Cagliari, Italy; [2]Dipartimento di Chimica e Farmacia, Università degli Studi di Sassari, Sassari, Italy

CA-11.2:IL07 **Combustion Synthesis of Metastable Ceramic Phases**
A.S. MUKASYAN, University of Notre Dame, Notre Dame, IN, USA

CA-11.2:L08 **SHS and Consolidation of Advanced High-temperature Borosilicide Based Ceramics**
YU.S. POGOZHEV, A.YU. POTANIN, M.V. ZINOVYEVA, S. VOROTILO, E.A. LEVASHOV, National University of Science and Technology "MISIS", Moscow, Russia

Session CA-11.3
SHS of bulk materials and composites

CA-11.3:IL01 **Medium- and High-entropy Ceramics and Ceramic-metal Composites by SHS**
A.S. ROGACHEV, Merzhanov Institute of Structural Macrokinetics and Materials Science (ISMAN), RAS, Chernogolovka, Moscow, Russia

CA-11.3:IL02 **Materials Evaluation of TiC-Al2O3 Ceramic-copper Layered Composites Prepared by Hot Explosive Welding**
RYUICHI TOMOSHIGE, K. TAKAKI, Y. MAEDA, S. MOMOKITA, K. KAI, Sojo University, Kumamoto, Japan

CA-11.3:IL03 **Advanced Composite Materials for High-temperature Fields of Application**
E.A. LEVASHOV, S. VOROTILO, YU.S. POGOZHEV, V.V. KURBATKINA, The National University of Science and Technology "MISIS", Moscow, Russia

CA-11.3:IL04 **Combustion Synthesis of MAX Phase Solid Solutions**
A.V. GUBAREVICH, K. YOSHIDA, Tokyo Institute of Technology, Tokyo, Japan

CA-11.3:IL05 **Centrifugal SHS Metallurgy**
V.I. YUKHVID, V.N. SANIN, D.E. ANDREEV, Merzhanov Institute of Structural Macrokinetics and Materials Science, RAS, Chernogolovka, Moscow, Russia

CA-11.3:IL06 **Self-propagating High-temperature Synthesis (SHS) in Joining Technologies**
L.P.H. JEURGENS, B. RHEINGANS, L. DÖRNER, P. SCHMUTZ, J. JANCZAK-RUSCH, Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Joining Technologies and Corrosion, Dübendorf, Switzerland

CA-11.3:L07 **(Ta1-x,Zrx)C and (Ta1-x,Hfx)C Solid Solutions: Structure, Properties and Application**
V.V. KURBATKINA, E.I. PATSERA, P.A. LOGINOV, E.A. LEVASHOV, National University of Science and Technology "MISIS", Moscow, Russia

Session CA-11.4
Application and industrialization

CA-11.4:IL01 **Formation of Microparticles from Silicone Contaminants in Space Environment**
RIYO YAMANAKA, Japan Aerospace Exploration Agency, Tsukuba, Ibaraki, Japan

CA-11.4:L02 **SHS-related Technologies with Spinel- and Hydroxide-type Compounds Application for a Sustainable Energy and Environment**
O. ODAWARA, PROSAP Inc., Tokyo, Japan

Focused Session CA-12
CERAMIC JOINING: FROM MACRO- TO NANO-LENGTH SCALES

Session CA-12.1
Nano-scale interface of dissimilar materials

CA-12.1:IL01 **Agglomeration of Thin Metal Bilayer Films**
K. VAN BENTHEM, Department of Materials Science and Engineering, University of California, Davis, Davis, CA, USA

CA-12.1:IL02 **Nanoscale Dynamic Observations of Fracture, Deformation and Twin Formation in Oxides**
YUICHI IKUHARA, Institute of Engineering Innovation, The University of Tokyo; Nanostructures Research Laboratory, Japan Fine Ceramics Center; WPI-AIMR, Tohoku University, Japan

CA-12.1:IL03 **Influence of Graphene Layers on Metal-ceramic Wetting and Adhesion**
D. GIURANNO[1], J. NARCISO[2], R. NOVAKOVIC[1], N. SOBCZAK[3], S. LARA[4], R. YAKIMOVA[5], J.F. SANZ[6],
[1]Institute of Condensed Matter Chemistry and Energy Technologies (ICMATE), National Research Council of Italy (CNR), Genoa, Italy; [2]Instituto Universitario de Materiales de Alicante (IUMA), Universidad de Alicante, Alicante, Spain; [3]Lukasiewicz Research Network - Foundry Research Institute, Krakow, Poland; [4]Graphensic AB, Linköping, Sweden; [5]Department of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden; [6]Departamento de Química Física, Universidad de Sevilla, Sevilla, Spain

CA-12.1:IL04 **Spalling Fracture in Nickel/Semiconductor Systems**
C.E. PACKARD, Colorado School of Mines, Golden,CO, USA

Session CA-12.2
Macro-joining and application engineering

CA-12.2:IL01 **Advanced Routes for Brazing SiC: Wetting and Interfacial Phenomena**
F. VALENZA, S. GAMBARO, M.L. MUOLO, A. PASSERONE, CNR-ICMATE, Genova, Italy

CA-12.2:IL02 **Active Metal Brazing of Alumina**
K.M. KNOWLES, M. ALI, University of Cambridge, Department of Materials Science and Metallurgy, Cambridge, UK; P.M. MALLINSON, AWE plc, Aldermaston, Reading, Berkshire, UK; J.A. FERNIE, School of Science, Engineering & Design, Stephenson Building, Teesside University, Tees Valley, UK

CA-12.2:L03 **Interfacial Energy as the Driving Force for Diffusion Bonding of Ceramics**
S. KOVACEVIC, **S.Dj. MESAROVIC**, School of Mechanical and Materials Engineering, Washington State University, Pullman, USA; R. PAN, Laser Materials Processing Research Center, School of Materials Science and Engineering, Tsinghua University, Beijing, China; D.P. SEKULIC, Department of Mechanical Engineering, College of Engineering, University of Kentucky, Lexington, KY, USA; State Key Laboratory of Advanced Welding and Joining, School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China

CA-12.2:IL04 **Direct Observation of Metallurgical Interface between Molten Metal and Oxide**
MASASHI NAKAMOTO, Osaka University, Suita, Osaka, Japan

CA-12.2:IL05 **Experimental Investigation of Joining Silicon Carbide Composites to Zircaloy**
H. SERIZAWA, Y. SATO, M. TSUKAMOTO, Joining and Welding Research Institute, Osaka University, Ibaraki, Osaka, Japan; N. NAKAZATO, H. KISHIMOTO, Muroran Institute of Technology, Muroran, Hokkaido, Japan

CA-12.2:L06 **Atmospheric Plasmas for Improving Mechanical Performances of Joined SiC Components**
A. DE ZANET, M. SALVO, V. CASALEGNO, Department of Applied Science and Technology (DISAT), Politecnico di Torino, Italy

CA-12.2:IL07 **Effect of Carbon Dissolution Reaction on Reactive Wetting Behaviour against Molten Fe-C Alloy on Carbonaceous Substrate**
K. OHNO, T. MAEDA, K. KUNITOMO, Kyushu University, Fukuoka, Japan; C.S. NGUYEN, Hanoi University of Science and Technology, Hanoi, Vietnam

CA-12.2:L08 **Ceramic-Metal Interface: Characterization on Alumina-Alumina Ceramic Vacuum brazed Additive Manufacturing (AM) Technology**
S. STALIN, K. KALAICHELVAN, Department of Ceramic Technology, ACT Campus, Anna University, Chennai, Tamil Nadu, India

SYMPOSIUM CB
BIG DATA AND MACHINE LEARNING METHODS FOR MATERIALS ADVANCEMENTS

Session CB-1
Big data emerging technologies for innovative materials design and manufacturing

CB-1:KL1 **Network Theory Meets Materials Science**
C. WOLVERTON[1], V. HEGDE[1], M. AYKOL[2], [1]Northwestern University, Department of Materials Science and Eng., Evanston, IL USA; [2]Toyota Research Institute, Los Altos, CA USA

CB-1:IL01 **Autonomous Combinatorial Experimentation**
ICHIRO TAKEUCHI, University of Maryland, College Park, MD, USA

CB-1:IL02 **Big Data, Machine Learning and Virtual Design of High Entropy Alloys for Ceramics Carbides and Nitrides**
WAI-YIM CHING, University of Missouri, Kansas City, USA

CB-1:IL03 **Data Driven Discovery of New Oxides and Nitrides**
ISAO TANAKA, Dept. Mater. Sci. Engrg, Kyoto University, Kyoto, Japan; Nano Research Lab., JFCC, Nagoya, Japan

CB-1:IL04 **Understanding General Grain Boundaries in 8+ Dimensions for Big Data Enhanced Materials Design**
JIAN LUO, University of California San Diego, La Jolla, CA, USA

CB-1:IL05 **Native and Artificial Intelligence-guided Design of Glasses**
E.D. ZANOTTO, Center of Research, Technology and Education in Vitreous Materials, Federal University of São Carlos, Brazil

CB-1:IL06 **Active Learning of Bayesian Force Fields for Fast Molecular Dynamics Simulations of Rare Events**
B. KOZINSKY, Harvard University, Cambridge, MA, USA

CB-1:IL07 **Research Data Acquisition based on Researcher Behavior**
JEHYUN LEE[1], MINHO LEE[2], YOON-SU SHIM[3], CHAN-WOO LEE[1], JONG MIN YUK[3], JAE-PYOUNG AHN[4], [1]Platform R&D Laboratory, Korea Institute of Energy Research; [2]Virtual Lab. Co. Ltd.; [3]Department of Materials Science & Engineering, Korea Advanced Institute of Science and Technology; [4]Advanced Analysis Center, Korea Institute of Science and Technology, South Korea

CB-1:IL08 **AiiDA and Materials Cloud: Coupling High-throughput Computational Automation with Data Management for the Creation of Materials Properties Databases**
G. PIZZI, EPFL and NCCR MARVEL, Lausanne, Switzerland

CB-1:L09 **Smart Data Analysis for Machining of Ceramic Matrix Composites**
R. GOLLER, P. LEON-PEREZ, University of Applied Sciences, Augsburg, Germany

Session CB-2

Quantification of materials characterization by data analysis and machine learning methods

CB-2:KL1 **Monte-Carlo Random Walks for Solving Equations in Large Images. Application to Simulations of CMC Processing and Degradation**
G.L. VIGNOLES, C. CHARLES, C. HEISEL, C. DESCAMPS, University of Bordeaux, CNRS, CEA, Safran : LCTS , Pessac, France

CB-2:IL01 **Stereological Analysis and Modeling of Complex 3D Particle Systems, Using X-Ray Tomography, in Combination with Co-registered 2D SEM-based Image Data**
O. FURAT, T. KIRSTEIN, **V. SCHMIDT**, Ulm University, Institute of Stochastics, Ulm, Germany; T. LEISSNER, U. PEUKER, TU Bergakademie Freiberg, Institute of Mechanical Process Engineering and Mineral Processing, Freiberg, Germany; K. BACHMANN, J. GUTZMER, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

CB-2:IL02 **Hyperspectral Image Analysis for Datasets Obtained by Multiple Spectroscopies**
SHUNSUKE MUTO, AMTC, Institute of Materials & Systems for Sustainability, Nagoya University, Nagoya, Japan

CB-2:KL2 **Machine Learning Models to Predict VISAR Profiles in Complex Materials Using Microstructure Characteristics as Inputs**
C.C. BATTAILE, W.L DAVIS, Sandia National Laboratories, Albuquerque, NM, USA

CB-2:IL03 **Deep Learning Methods for Microstructural Representation, Characterization, and Analysis**
E.A. HOLM, Carnegie Mellon University, Pittsburgh, PA, USA

CB-2:IL04 **Accelerating Glass Discovery through Machine Learning and Artificial Intelligence**
N.M. ANOOP KRISHNAN, Department of Civil Engineering, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, India

CB-2:IL05 **Data-driven Spectral Analysis for Materials Characterization**
TERUYASU MIZOGUCHI, The University of Tokyo, Tokyo, Japan

CB-2:IL06 **Quantitative Analysis of Multi-phase Materials with Microstructural Features Existing over a Wide Range of Size Scales**
J. SOSA, MIPAR, Worthington, OH, USA; **H. FRASER,** The Ohio State University, Columbus, USA

CB-2:L07 **AI-Accelerated Materials Structure-Property-Synthesizability Prediction**
YOUSUNG JUNG, Department of Chemical & Biomolecular Engineering, KAIST, Daejeon, South Korea

CB-2:IL08 **Multiscale Modeling of Plasticity and Fracture: A Statistical and Data Science Perspective**
S. PAPANIKOLAOU, West Virginia University, Department of Mechanical and Aerospace Engineering, Department of Physics, Morgantown, WV, USA

CB-2:IL09 **Machine Learning Analysis of Multiphase Magnetic Microstructures**
A. KORNELL, A. KOVACS, M. GUSENBAUER, **T. SCHREFL**, Danube University Krems, Wiener Neustadt, Austria

SYMPOSIUM CC

MODELLING, SIMULATION AND TESTING OF MECHANICAL AND THERMOMECHANICAL PROPERTIES OF BULK CERAMICS, COATINGS AND COMPOSITES

Session CC-1

Bulk (dense/porous) ceramic materials and components

CC-1:IL01 **High Entropy Transition Metal Carbides – Compositional Space and Mechanical Properties**
Y. WANG[1], R. ZHANG[1], T. CASANDI[2], J. DUSZA[2], **M.J. REECE**[1], [1]Queen Mary University of London, London, UK; [2]Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovak Republic

CC-1:IL02 **Deformation and Fracture of Advanced Ceramics at Small-Scale during Micro/Nano Mechanical Testing**
J. DUSZA, Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovak Republic

CC-1:IL03 **Meso-scale Mechanical Properties of Si3N4 Ceramics Measured using Microcantilever Beam Specimens**
JUNICHI TATAMI, M. UDA, M. IIJIMA, Yokohama National University, Yokohama, Japan; T. TAKAHASHI, T. YAHAGI, Kanagawa Institute of Industrial Science and Technology, Japan

CC-1:IL04 **Consequences of Nanostructure in Bulk Dense Ceramics**
J.A. WOLLMERSHAUSER, K.P. ANDERSON, H. RYOU, E.P. GORZKOWKSI, B.N. FEYGELSON, U.S. Naval Research Laboratory (NRL), Washington, DC, USA

CC-1:IL05 **Influence of Structure and Design on Ballistic Performance of Ceramic Armor**
E. MEDVEDOVSKI, Endurance Technologies Inc., Calgary, Canada

CC-1:IL06 **Chemical Strengthening of Li2O-Al2O3-SiO2 (LAS) Glass Ceramics Using Hydroxide Additive**
X.G. LYU, H.Y. HAO, B.Q. HOU, B. WANG, **JIANFENG YANG**, State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, Xi'an, China

CC-1:IL07 **Crystal Chemistry, Compression Behaviors and Thermal Expansion of Novel Metal Nitrides Synthesized under Ultra-high Pressure and Temperature**
MASASHI HASEGAWA, N.A. GAIDA, K. NIWA, T. SASAKI, Nagoya University, Nagoya, Japan

CC-1:IL08 **Hot-pressed Ultra-high Creep Resistant Silicon Carbide Ceramics**
P. SAJGALIK, Slovak Academy of Sciences, Bratislava, Slovakia

CC-1:L09 **Thermomechanical Modelling of Steel Ladle Considering Irreversible Mechanical Behavior of Refractories**
S. SAMADI, SHENGLI JIN, D. GRUBER, H. HARMUTH, Montanuniversitaet Leoben, Leoben, Austria

CC-1:L10 **Simulation of Densification Behavior of Nano-powder in Final Sintering Stage**
BYUNG-NAM KIM, K. MORITA, T.S. SUZUKI, J.-G. LI, National Institute for Materials Science, Tsukuba, Ibaraki, Japan; H. MATSUBARA, Tohoku University, Japan

CC-1:IL11 **Atomic-scale Investigations of Deformation Behavior of Ceramic Materials**
EITA TOCHIGI, Institute of Industrial Science, The University of Tokyo, Tokyo, Japan

CC-1:L12 **Gas Pressure Sintered Si3N4: Extraction of the Sintering Parameters by In-situ Conventional Dilatometry**
T. GRIPPI[1, 2, 3], S. BEHAR-LAFENETRE[2], H. FRIEDRICH[3], D. HAAS[4], U. SCHENDERLEIN[4], C. MANIÈRE[1], S. MARINEL[1], [1]Normandie Univ, ENSICAEN, UNICAEN, CNRS, CRISMAT, Caen, France; [2]Thales Alenia Space, Cannes, France; [3]Fraunhofer HTL, Bayreuth, Germany; [4]FCTI, Rauenstein, Germany

CC-1:L13 **Nanomechanical Properties of Glass-ceramic Materials from the SiO2-Al2O3-Na2O-K2O-MgO System with an Addition of SrO**
K. KACZMARCZYK, J. PARTYKA, AGH University of Science and Technology in Krakow, Faculty of Materials Science and Ceramics, Department of Ceramics and Refractory Materials, Krakow, Poland

CC-1:L14 **Crack Resistance of Grain Boundaries in the Y2O3 Doped Alumina**
G.V. SHCHERBAK, M.S. BOLDIN, Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia

CC-1:IL15 **Control of Dislocation Behavior to Improve Low Temperature Plasticity of Ceramic Materials**
A. NAKAMURA, Osaka University, Toyonaka, Osaka, Japan

CC-1:IL16 **Unexpected Law for Grain Growth in Twinned Boron Carbide Ceramics Fabricated under Electric Field**
D. GÓMEZ GARCÍA, Department of Condense Matter Physics, CSIC, University of Seville, Seville, Spain; B.M. MOSHTAGHIOUN, Department of Condense Matter Physics, CSIC, University of Seville, Seville, Spain

CC-1:IL17 **Direct Observation of Atomic Mechanisms of Grain Boundary Migration**
JIAKE WEI[1, 2], BIN FENG[1], RYO ISHIKAWA[1], EITA TOCHIGI[1], NAOYA SHIBATA[1], YUICHI IKUHARA[1, 2], [1]The University of Tokyo, Tokyo, Japan; [2]Kyoto University, Kyoto, Japan

Session CC-2
Thick coating, thin films, graded materials

CC-2:IL01 **Co-optimization of Thermal/mechanical Properties for Durable High Temperature Coatings**
GUAN-JUN YANG, School of Materials Science and Engineering, Xi'an Jiaotong University, Xi'an, China

CC-2:IL02 **CMAS Induced Microstructure Degradation of Thermal Barrier Coatings for Application in Gas Turbine Environments**
D.E. MACK[1], G. BRUNO[2, 3], O. HELLE[1], O. JARLIGO[1], J. MALZBENDER[4], B.R. MÜLLER[2], R. VASSEN[1], [1]IEK-1, Forschungszentrum Jülich GmbH, Jülich, Germany; [2]BAM, Bundesanstalt für Materialforschung und -Prüfung, Berlin, German; [3]University of Potsdam, Institute of Physics and Astronomy, Potsdam, Germany; [4]IEK-2, Forschungszentrum Jülich GmbH, Jülich, Germany

CC-2:IL03 **Design and Property of Ceramic Coating of Deuterium-Tritium Permeation Barrier**
HEPING LI, CAIXUAN LU, ZHIQIANG KE, YA WANG, JIAO DI, ZIRUI ZHAO, LIHONG XUE, YOUWEI YAN, Huazhong University of Science & Technology, Wuhan, China

CC-2:IL04 **Fundamental and Practice of RE-silicate Multifunctional Thermal and Environmental Barrier Coating**
JINGYANG WANG, Advanced Ceramics and Composites Division, Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS, China

CC-2:IL05 **Eutectic Ceramic Composites for High Performance Thermal Barrier Coatings**
WEI PAN, HAFIZ SARTAJ AZIZ, MUZHANG HUANG, MIN WANG, ZONGYUAN LI, CHUNLEI WAN, Tsinghua University, Beijing, China

CC-2:IL06 **Engineering Design of High-performance Silicon Nitride with Gradient Microstructure**
HUA-TAY LIN, JUN-JIE YU, WEI-MING GUO, School of Electromechanical Engineering, Guangdong University of Technology, Guangzhou, China

CC-2:L07 **Lifetime of an Environmental Barrier Coating under Multiphysical Loadings**
I. HAMADOUCHE, ONERA / LMT ENS PARIS-SACLAY, Châtillon, Île-de-France, France; T. ARCHER, P. BEAUCHÊNE, ONERA, Châtillon, Île-de-France, France; T. VANDELLOS, Safran Ceramics, Mérignac, Nouvelle-Aquitaine, France; F. HILD, LMT ENS Paris-Saclay, Gif-sur-Yvette, Île-de-France, France

Session CC-3
Particulate, fibre, nanomaterial reinforced CMCs and MMCs

CC-3:IL01 **Interfacial Fracture Toughness on SiC/SiC CMCs**
O. GAVALDA-DIAZ, L. VANDEPERRE, E. SAIZ, F. GIULIANI, Centre of Advanced Structural Ceramics, Department of Materials, Imperial College London, London, UK

CC-3:IL02 **Modeling of the Effects of Constituents and Microstructure on the Thermomechanical Properties of Ceramic Matrix Composites**
E. MAILLET, M. MOSCINSKI, A. BAGRI, P. MEYER, D. DUNN, GE Research, Niskayuna, NY, USA

CC-3:L03 **Amorphous Ceramic and Metallic Composites for the Applications in Extreme Environments**
JIAN WANG, University of Nebraska-Lincoln, Lincoln, NE, USA

CC-3:IL04 **Residual Stresses and Texture Characteristics in Si3N4 Ceramic Composites**
C.C. YE, School of Mechanical-Electronic and Vehicle Engineering, Weifang University, Weifang, Shandong, China; H.Q. RU, Key Laboratory for Anisotropy and Texture of Materials (Ministry of Education), Institute of Ceramics and Powder Metallurgy, School of Materials Science and Engineering, Northeastern University, Shenyang, Liaoning, China; **DAOLUN CHEN**, Department of Mechanical and Industrial Engineering, Ryerson University, Toronto, Ontario, Canada

CC-3:IL05 **Damage and Stress Evolution in Multi-phase Metal Matrix Composites**
G. BRUNO, S. EVSEVLEEV, T. MISHUROVA, S. CABEZA, BAM, Berlin, Germany; G. GARCES, CENIM, CSIC, Madrid, Spain; G.REQUENA, DLR, Cologne, Germany; I. SEVOSTIANOV, NMSU, Las Cruces, NM, USA

CC-3:IL06 **Microstructure Design and Mechanical Properties of Ceramic/Graphene Thick Coatings for New Emerging Applications**
C. BALAZSI, Centre for Energy Research, Budapest, Hungary

SYMPOSIUM CD
HIGH AND ULTRA HIGH TEMPERATURE CERAMICS AND COMPOSITES FOR EXTREME ENVIRONMENTS

Session CD-1
Synthesis and processing

CD-1:IL01 **Ceramic Matrix Composites for Application in Aeroengines**
D. KOCH, Institute of Materials Resource Management MRM, University of Augsburg, Augsburg, Germany

CD-1:IL02 **Processing of Sintered and Non-sintered UHTCMCs for Extreme Environments**
D. SCITI, A. VINCI, P. GALIZIA, S. FAILLA, F. SERVADEI, L. ZOLI, CNR-ISTEC, National Research Council of Italy - Institute of Science and Technology for Ceramics, Faenza, Italy

CD-1:IL03 **Synthesis and Properties of Boron Nitride Nanostructures**
C. REBHOLZ[1], N. KOSTOGLOU[2], B, MATOVIC[3], [1]Department of Mechanical & Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus; [2]Department of Materials Science, Montanuniversität Leoben, Leoben, Austria; [3]Vinča Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia

CD-1:IL04 **Fabrication and Testing of CMC for High Temperature Application**
SEA HOON LEE, JUN SEOP KIM, JIAN GU, HEE JUNG LEE, Korea Institute of Materials Science, South Korea

CD-1:IL05 **Ultra-high Temperature Ceramic Matrix Composites (UHTCMCs) Made by RF Enhanced Chemical Vapour Infiltration (RF-CVI)**
V. VENKATACHALAM, J. BINNER, School of Metallurgy and Materials, University of Birmingham, UK

CD-1:L06 **Colloidal Processing of Nano-nickel Doped WC Compacts for Improved Hot Press and Pressureless Sintering**
E.M. GARCIA AYALA, Z. GONZALEZ, B. FERRARI, **A.J. SANCHEZ-HERENCIA**, ICV-CSIC, Madrid, Spain; J.Y. PASTOR, Univ. Polytech. Madrid, Spain; L. SILVESTRONI, ISTEC-CNR, Faenza, Italy

CD-1:IL07 **C3HARME: Next Generation Ceramic Composites for Combustion Harsh Environments and Space**
L. ZOLI, P. GALIZIA, L. SILVESTRONI, A. VINCI, S. FAILLA, F. SERVADEI, D. SCITI, CNR-ISTEC, National Research Council of Italy - Institute of Science and Technology for Ceramics, Faenza, Italy

CD-1:L08 **Optimization of Processing Conditions for the Fabrication of Bulk High Entropy Borides**
S. BARBAROSSA[1], R. ORRÙ[1], A. IACOMINI[2], S. GARRONI[2], G. CAO[1], [1]Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università degli Studi di Cagliari, Cagliari, Italy; [2]Dipartimento di Chimica e Farmacia, Università degli Studi di Sassari, Sassari, Italy

CD-1:L09 **Near Net Shape Manufacturing of Complex Components of Thermal Protection System of a Re-entry Vehicle based on Liquid Silicon Infiltration (LSI) process**
M. DE STEFANO FUMO, P. SPENA, F. DE NICOLA, R. GARDI, R. FAUCI, G. RUFOLO. Centro Italiano Ricerche Aerospaziali (CIRA), Italy; **L. CAVALLI**, F. GIACOMETTI, M.Y. AKRAM, M. BOIOCCHI, M. CANTÙ, M. VALLE. Petroceramics S.p.A., Stezzano, Italy

CD-1:L10 **Highly Electrically and Thermally Conductive Silicon Carbide - Graphene Composites**
O. HANZEL, Z. LENČÉŠ, Y-W. KIM, J. FEDOR, P. ŠAJGALÍK, Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava, Slovak Republic; Functional Ceramics Laboratory, Department of Materials Science and Engineering, University of Seoul, Seoul, South Korea; Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovak Republic

CD-1:IL11 **Effect of Sintering Technique on Properties of Nanocrystalline Composite B4C/SiC Ceramics**
B. MATOVIC, University of Belgrade, Institute for Nuclear Sciences Vinca, Serbia

CD-1:L12 **Titanium Carbide Nanostructured Targets for Nuclear Medicine and Physics Applications**
S. CORRADETTI, A. ANDRIGHETTO, INFN, Laboratori Nazionali di Legnaro, Legnaro, Italy; S. CARTURAN, G. MAGGIONI, Università di Padova, Dipartimento di Fisica e Astronomia, Padova, Italy; G. FRANCHIN, P. COLOMBO, Università di Padova, Dipartimento di Ingegneria Industriale, Padova, Italy

CD-1:L13 **Novel Multicomponent Pyrochlore Oxides for Future Thermal Barrier Coatings**
P. HUTTERER, M. LEPPLE, DECHEMA Research Institute, Frankfurt a.M., Germany

CD-1:L14 **Flash Spark Plasma Sintering of Pure TiB2 with Dieless Configuration**
S. FAILLA[1], SHUAI FU[2], S. GRASSO[2], D. SCITI[1], [1]ISTEC-CNR, Faenza, Italy; [2]Key Laboratory of Advanced Technologies of Materials, Ministry of Education, School of Materials Science and Engineering, Southwest Jiaotong University, Chengdu, China

Session CD-2
Corrosion, oxidation, and testing

CD-2:IL01 **Effects of Coating and Substrate Chemistry on the Steam Oxidation Kinetics of Environmental Barrier Coatings for Ceramic Matrix Composites**
KANG LEE, NASA Glenn Research Center, Cleveland, OH, USA; A. GARG, NASA Glenn Research Center / University of Toledo, Toledo, OH, USA; W.D. JENNINGS, Vantage Partners, Cleveland, OH, USA

CD-2:IL02 **High-temperature Oxidation/Corrosion of Silicon Carbide for Nuclear Applications**
M. STEINBRÜCK, Karlsruhe Institute of Technology, Institute for Applied Materials (IAM-AWP), Germany

CD-2:IL03 **Corrosion Behavior of RE-doped Silicate for Environmental Barrier Coatings**
BYUNG-KOOG JANG, Interdisciplinary Graduate School of Engineering Science (IGSES), Kyushu University, Fukuoka, Japan

CD-2:IL04 **Investigation of Ceramic Materials in High Enthalpy Flows of Interest for Aerospace**
R. SAVINO, University of Naples Federico II, Department of Industrial Engineering, Naples, Italy

CD-2:IL05 **Tungsten Carbides and Borides for Shielding of Compact Tokamak Fusion Reactors**
S.A. HUMPHRY-BAKER, Department of Materials, Imperial College London, London, UK

CD-2:L06 **Oxidation Behaviour and Thermal Shock Resistance of Ceramic Composites based on Carbides and Borides**
A. KOVALČÍKOVÁ[1], M. IVOR[1], P. TATARKO[2], H. ÜNSAL[2], R. SEDLÁK[1], D. MEDVED[1], A. NAUGHTON-DUSZOVÁ[1, 3], E. BACZEK[3], M. PODSIADŁO[3], J. DUSZA[1], [1]Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovak Republic; [2]Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava, Slovak Republic; [3]Institute of Advanced Manufacturing Technology, Krakow, Poland

CD-2:L07 **Oxidation Resistance and Evolution of Multi-layered Oxide Scale during Isothermal and Cyclic Exposure of ZrB2-SiC-LaB6 Composites at 1300°C-1500°C**
S.K. KASHYAP, **R. MITRA**, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India

CD-2:IL09 **Oxidation of Zirconium and Uranium Carbides**
C. GASPARRINI[1*], R. PODOR[2], R.J. CHATER[3], D. HORLAIT[4], O. FIQUET[5], S. MAY[6], M.J.D. RUSHTON[7,1], W.E. LEE[1,7], [1]Centre for Nuclear Engineering (CNE) & Department of Materials, Imperial College London, South Kensington Campus, London, UK; [2]Institut de Chimie Séparative de Marcoule, UMR 5257 CEA/CNRS/UM/ENSCM, Site de Marcoule, Bagnols-Sur-Cèze, France; [3]Department of Materials, Imperial College London, South Kensington Campus, London, UK: [4]CNRS, Centre D'Etudes Nucléaires de Bordeaux-Gradignan, UMR 5797, Chemin Du Solarium, Gradignan, France; [5]DEN/DEC/SA3E/LCU Building 315, Atomic Energy Commission (CEA), Saint Paul lez Durance Cadarache, France; [6]National Nuclear Laboratory, Preston Laboratory (A709), Springfields, Preston, Lancashire, UK; [7]Nuclear Futures Institute, Bangor University, Bangor, Gwynedd, UK; *Consorzio RFX, Padova, Italy

CD-2:IL10 **Wear Resistance, High Temperature Stability and Electrical Conductivity in Air of Ti,Nb-Al-C MAX Phases-based Hot-pressed Bulks and Vacuum-arc Deposited Films**
T.A. PRIKHNA[1], T.B. SERBENYUK[1], O.P. OSTASH[2], A.S. KUPRIN[3], V.YA. PODHURSKA[2], V.B. SVERDUN[1], [1]Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine; [2]Karpenko Physical-Mechanical Institute of the National Academy of Sciences of Ukraine, Lviv, Ukraine; [3]National Science Center Kharkov Institute of Physics and Technology, Kharkov, Ukraine

CD-2:IL11 **Hot Gas Corrosion of Ceramic Matrix Composites**
W. KUNZ, H. KLEMM, A. MICHAELIS, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany

Session CD-3
Mechanical, thermal and optical properties

CD-3:IL01 **Ultra-high Temperature Mechanical and Thermal Properties of UHTCs**
W.G. FAHRENHOLTZ, G.E. HILMAS, Missouri University of Science and Technology, Materials Research Center, Rolla, MO, USA

CD-3:IL02 **High-temperature Mechanical Characterization of UHTCMCs**
T. REIMER, DLR, Inst. of Structures and Design, Stuttgart, Germany; D. SCITI, CNR-ISTEC, Faenza, Italy; M. LAGOS GOMEZ, TECNALIA, Spain; J. BINNER, University of Birmingham, UK

CD-3:IL03 **The Effect of Rare-earth based Additives on the Mechanical Properties of ZrB2-SiC Composites prepared by Reactive and Non-Reactive Sintering Route**
P. TATARKO[1], H. ÜNSAL[1], B. MATOVIĆ[2], Z. CHLUP[3], M. TATARKOVÁ[1], A. KOVALČÍKOVÁ[4], M. HIČÁK[1], I. DLOUHÝ[3], P. ŠAJGALÍK[1]; [1]Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava, Slovakia; [2]Centre of Excellence "CEXTREME LAB", Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia; [3]Institute of Physics of Materials, Czech Academy of Sciences, Brno, Czech Republic; [4]Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovak Republic

CD-3:L04 **High-temperature Mechanical Testing and Properties of an Advanced Low-density Metal-ceramic Material**
WYMAN ZHUANG, Aerospace Division, Defence Science and Technology Group, Melbourne, Australia

CD-3:L05 **Damage Mechanisms of an Environmental Barrier Coated Ceramic Matrix Composite under Thermal Gradients and Mechanical Loading**
T. ARCHER[1], I. HAMADOUCHE[1, 2], P. BEAUCHÊNE[1], T. VANDELLOS[3], [1]ONERA, Châtillon, France; [2]LMT ENS Paris Saclay, France; [3]SAFRAN CERAMICS, Mérignac, France

CD-3:IL06 **Thermal and Mechanical Properties of Zeta Phase Tantalum Carbide**
G.E. HILMAS, W.G. FAHRENHOLTZ, Missouri University of Science and Technology Rolla, MO, USA

CD-3:IL07 **Enhanced Thermal Conductivity in Silicon Nitride with Carbon Addition**
HAI-DOO KIM, School of Materials Science & Engineering, Kumoh National Institute of Technology, Gyeongbuk, South Korea

CD-3:L08 **The Behavior of UHTC Carbides and Nitrides in Various Environments up to 4500 K**
M. SHEINDLIN, T.BGASHEVA, M.BRYKIN, A.FROLOV, S.PETUKHOV, A. VASIN, P. VERVIKISHKO, Joint Institute for High Temperatures of RAS, Moscow, Russia

CD-3:L09 **Creep Behaviour of Zirconia Composites with Different Amounts of Reduced Graphene-oxide Sintered by Spark Plasma Sintering**
R. CANO-CRESPO[1], P. RIVERO-ANTÚNEZ[1], R. MORENO[2], D. GÓMEZ-GARCÍA[1,3], A. DOMÍNGUEZ-RODRÍGUEZ[1], [1]Department of Condensed Matter Physics, University of Seville, Seville, Spain; [2]Institute of Ceramics and Glass, CSIC, Madrid, Spain; [3]Institute of Science of Materials of Seville, CSIC-USE, Seville, Spain

Session CD-4
Characterization, analysis, and simulation

CD-4:IL01 **First Principles Simulations of Entropy Stabilized UHTCs**
M. LIM, S. DAIGLE, Z. RAK, **D.W. BRENNER**, Department of Materials Science and Engineering North Carolina State University Raleigh, NC, USA

CD-4:IL02 **Micromechanical Modelling of Fracture Mechanics in Fibre Reinforced Ceramics-matrix Composites**
LONGBIAO LI, College of Civil Aviation, Nanjing University of Aeronautics and Astronautics, Nanjing, China

CD-4:IL03 **Strong Boride Hierarchical Composites for Ultra-high Temperature Applications**
L. SILVESTRONI[1], N. GILLI[1,2], A. MIGLIORI[2], D. SCITI[1], J. WATTS[3], G.E. HILMAS[3], W.G. FAHRENHOLTZ[3], [1]CNR-ISTEC, Institute of Science and Technology for Ceramics, Faenza, Italy; [2]CNR-IMM, Institute for Microelectronics and Microsystems, Bologna, Italy; [3]Department of Materials Science and Engineering, Missouri University of Science and Technology, MO, Rolla, USA

CD-4:IL04 **Computational Studies of the Phase Stability of UHTC Transition Metal Carbides and Nitrides**
C.R. WEINBERGER, Colorado State University, Fort Collins, CO, USA; XIAO-XIANG YU, North Western University, Evanston, IL, USA; G. THHOMPSON, The University of Alabama, Tuscaloos, AL, USA

CD-4:IL05 **Combining Density Function Theory and Machine Learning to Model UHTCs**
S. SANVITO, Y. ZHANG, School of Physics, AMBER and CRANN Institute, Trinity College, Dublin, Ireland

SYMPOSIUM CE
PROGRESS IN NANO-LAMINATED TERNARY CARBIDES, NITRIDES AND BORIDES (MAX/MAB) PHASES AND DERIVATIVES THEREOF (MXENES)

Session CE-1
New MAX/MAB/MXenes

CE-1:IL01 **Chemically Ordered Laminate Borides and their Two-dimensional Derivatives from Chemical Exfoliation**
J. ROSEN, Materials Design, Department of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden

CE-1:IL02 **New Solid Solution MAX Phases**
B. TUNCA, K. VAN LOO, **J. VLEUGELS**, KU Leuven, Department of Materials Engineering, Heverlee, Belgium; K. LAMBRINOU, SCK CEN, Mol, Belgium & University of Huddersfield, School of Computing and Engineering, Huddersfield, UK

CE-1:IL03 **Topological Chemistry for New MAX Phases and their Derived MXenes**
QING HUANG, Engineering Laboratory of Advanced Energy Materials, Ningbo Institute of Industrial Technology, CAS, Ningbo, Zhejiang, China

CE-1:L04 **Investigation of Two-dimensional Boridene from First Principles and Experiments**
P. HELMER[1], J. HALIM[1], J. ZHOU[1], R. MOHAN[2], B. WICKMAN[2], J. BJÖRK[1], J. ROSEN[1], [1]Materials Design Division, Department of Physics, Chemistry and Biology, IFM, Linköping University, Linköping, Sweden; [2]Chemical physics, Department of Physics, Chalmers University of Technology, Gothenburg, Sweden

CE-1:IL05 **Theoretical and Experimental Exploration for Expanding the Elemental Space of Chemically Ordered and Disordered MAX and MAB Phases**
M. DAHLQVIST, J. ROSEN, Materials Design Division, Department of Physics, Chemistry, and Biology (IFM), Linköping University, Linköping, Sweden

CE-1:IL06 **Calculation-driven Discovery of a Series of New Ternary Borides with Hexagonal Symmetry**
JUNJIE WANG, Northwestern Polytechnical University, Xi'an, Shaanxi, China

CE-1:L07 **Theoretical Stability Predictions of Orthorhombic and Hexagonal Ternary MAB Phases**
A. CARLSSON, J. ROSÉN, M. DAHLQVIST, Materials Design Division, Department of Physics, Chemistry, and Biology (IFM), Linköping University, Linköping, Sweden

CE-1:L08 **Chemical Exfoliability of MAX Phases in Hydrogen Fluoride Studied from First Principles**
J. BJÖRK, J. HALIM, J. ZHOU, J. ROSEN, Materials Design Division, Department of Physics, Chemistry and Biology (IFM), Linköping University, Sweden

Session CE-2
Synthesis and fabrication of MAX/MAB/MXenes

CE-2:IL01 **Quat Derived Nanomaterials or QDNs**
M.W. BARSOUM, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA

CE-2:IL02 **Synthesis of MAX Phases with Unique Shapes and Morphologies**
C.S. BIRKEL, J.P. SIEBERT, Arizona State University, Tempe, AZ, USA; N. KUBITZA, Technische Universität Darmstadt, Darmstadt, Germany

CE-2:IL03 **Synthesis of Two-dimensional Carbide Mo2CTx MXene by Hydrothermal Etching with Fluorides and its Thermal Stability**
Y.T. GUO, S. JIN, **AIGUO ZHOU**, School of Materials Science and Engineering, Henan Polytechnic University, Jiaozuo, Henan, China

CE-2:L04 **Near Ambient Conditions, Bottom-up Synthesis of Metal Oxides 2D flakes, their Properties, and Potential Applications**
H. BADR, M. BARSOUM, Department of Material Science and Engineering, Drexel University, Philadelphia, PA, USA

CE-2:L05 **Pulsed Laser Deposition as a New Tool for the Epitaxial Growth of MAX Phase Thin Films**
H. PAZNIAK[1], M. STEVENS[1], A. JEMIOLA[1], M. FELEK[1], M. FARLE[1, 2], **U. WIEDWALD**[1], [1]Faculty of Physics and Center for Nanointegration Duisburg-Essen, University of Duisburg-Essen, Germany; [2]Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk, Russia

CE-2:IL06 **Discovery of Layered Two-dimensional MoSi2N4 Family**
WENCAI REN, Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS, Shenyang, China

CE-2:L07 **Synthesis in Hydride Cycle of Ti-Al-C based MAX-Phases from mixtures of Titanium Carbohydrides and Aluminum powders**
G.N. MURADYAN[1], S.K. DOLUKHANYAN, A.G. ALEKSANYAN, O.P. TER-GALSTYAN, N.L. MNATSAKANYAN, K.V. ASATRYAN, S.S.MARDANYAN, A.B. Nalbandyan Institute of Chemical Physics of Armenian National Academy of Sciences (IChPhNAS RA), Yerevan, Armenia

CE-2:L08 **Extrusion-based AM of MAX Phases Ti3SiC2 and Cr2AlC Feedstocks**
E. TABARES[1], A. JIMENEZ-MORALES[1], M. KITZMANTEL[2], E. NEUBAUER[2], **S.A. TSIPAS**[1], [1]Departamento de Ciencia e Ingenieria de Materiales e Ingenieria Quimica, IAAB, Universidad Carlos III de Madrid, Leganes, Spain; [2]RHP-Technology GmbH, Forschungs- und Technologiezentrum, Seibersdorf, Austria

CE-2:L09 **Optimized Spark Plasma Sintering of Bulk (Cr1-xMnx)2AlC MAX-phase**
K. SOBOLEV, M. GORSCHENKOV, M. DOROKHIN, V. RODIONOVA, Immanuel Kant Baltic Federal University, Kaliningrad, Russia; National University of Science and Technology MISiS, Moscow, Russia; Lobachevsky Nizhny Novgorod State University, Nizhny Novgorod, Russia

CE-2:L10 **Indium Nitride Gallium Nitride Nano-laminated by Microwave Plasma-assisted ALD**
R. GARCÍA-GUTIÉRREZ, F. ROMO-GARCÍA, Departamento de Investigación en Física de la Universidad de Sonora, Hermosillo, Sonora, México

CE-2:L11 **A Facile Fluoride-free Strategy to Synthesize Cr2CTx MXenes for Hydrogen Evolution Reaction**
XINSHU ZOU, K. MADHAV REDDY, Frontier Research Center for Materials Structure, State Key Laboratory of Metal Matrix Composites, School of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai, China

Session CE-3
Mechanical and oxidation properties of MAX/MAB/MXenes

CE-3:IL01 **Avoiding the Formation of Carbides in Cr2AlC MAX Phases under Oxidizing Environments**
C. AZINA[1], J. GONZALEZ-JULIAN[2], P. EKLUND[3], J.M. SCHNEIDER[1], [1]Materials Chemistry, RWTH Aachen, Germany; [2]Forschungszentrum Jülich, IEK-1, Germany; [3]Energy Materials Unit, Thin film Physics Division, IFM, Linköping University, Sweden

CE-3:IL02 **Breakaway Oxidation of Ti2AlC MAX Phase**
J. GONZALEZ-JULIAN, S. BADIE, O. GUILLON, R. VASSEN, Institute of Energy and Climate Research, Forschungszentrum Jülich, Jülich, Germany

CE-3:IL03 **Alumina Forming MAX phases: Current Status and Future Perspectives**
M. RADOVIC, Department of Materials Science & Engineering, Texas A&M University, College Station, TX, USA

CE-3:L04 **Elementary Deformation Mechanisms in Single-crystals of MAX Phases Analyzed by Complementary Experimental Approaches**
S. PARENT, C. TROMAS, **A. JOULAIN**, H. BAHSOUN, Pprime Institute, CNRS, University of Poitiers, ISAE-ENSMA, France; G. RENOU, SIMAP, Grenoble, France

CE-3:L05 **Intrinsic Deformation and Failure Response of Single Crystal MAX Phases**
ZHIQIANG ZHAN, H. RATHOD, M. RADOVIC, **A. SRIVASTAVA**, Department of Materials Science & Engineering, Texas A&M University, College Station, TX, USA

CE-3:IL06 **High-temperature Oxidation of Alumino-forming MAX Phases: Relationship between Powder Metallurgy Processing Routes, Microstructural Characteristics and Oxidation Resistance**
V. GAUTHIER-BRUNET[1], E. DROUELLE[1,2], B. LEVRAUT[1], A. ZUBER[1], J. CORMIER[1], P. VILLECHAISE[1], P. CHARTIER[1], S. DUBOIS[1], P. SALLOT[2], [1]Institut Pprime, CNRS - Université de Poitiers - ENSMA, UPR CNRS 3346, Futuroscope Chasseneuil, France; [2]Safran CRT, Magny-les-Hameaux Cedex, France

CE-3:IL07 **Theoretical and Experimental Insights into the Damage Tolerance of Nanolaminates: From the MAX Phase to the MAB Phases**
YUELEI BAI, XINXIN QI, NING LI, DONGDONG SUN, YONGTING ZHENG, XIAODONG HE, National Key Laboratory of Science and Technology on Advanced Composites in Special Environments and Center for Composite Materials and Structures, Harbin Institute of Technology, Harbin, China

CE-3:L08 **Enhancing the Oxidation Resistance of MXenes by Selective Edge Functionalization**
V. NATU, J.L. HART, M. SOKOL, H. CHIANG, M.L. TAHERI, M.W. BARSOUM, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA

CE-3:L09 **Cr2AlC Crystal Structure Evolution Prediction during Oxidation**
A. ZUBER[1], G. FRAPPER[2], V. BRUNET[1], S. DUBOIS[1], [1]Institut PPRIME, Chasseneuil du Poitou, France; [2]IC2MP, Poitiers cedex, France

CE-3:L10 **Analysis of 2D Ti3C2Tz MXene Oxidation and its Influence on Biological Response in Vitro**
A.M. JASTRZEBSKA[1], A. ROZMYSŁOWSKA-WOJCIECHOWSKA, A. SZUPLEWSKA, Warsaw University of Technology, Faculty of Materials Science and Engineering, Warsaw, Poland

Session CE-4
MAX/MAB and MXene composites and their properties

CE-4:IL01 **Application and Layer-by-layer Assembly of MXene Nanosheets**
J. LUTKENHAUS, M. GREEN, M. RADOVIC, Texas A&M University, College Station, TX, USA

CE-4:IL02 **Electrically Conductive Alumina-MXene Nanocomposite**
M. SOKOL, Tel Aviv University, Ramat Aviv, Israel

CE-4:IL03 **Physical Vapour Deposition of MoAlB Thin Films and Direct MoBene Formation**
S. EVERTZ[1], P. PÖLLMANN[1], D.M. HOLZAPFEL[1], E. MAYER[1], R. SAHU[1,2], D. BOGDANOVSKI[1], J.-O. ACHENBACH[1], C. SCHEU[2,3], **J.M. SCHNEIDER**[1,2], [1]Materials Chemistry, RWTH Aachen University, Aachen, Germany; [2]Max-Planck-Institut für Eisenforschung GmbH, Düsseldorf, Germany; [3]Materials Analytics, RWTH Aachen University, Aachen, Germany

CE-4:L04 **MXenes in Polymers and Nonpolar Solvents – Effects of Surface Modification on Stability and Dispersion**
M. CAREY, M.W. BARSOUM, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA

CE-4:IL05 **Design of Functional Composites by Using MAX and MAB Phases**
S. GUPTA, University of North Dakota, Grand Forks, ND, USA

CE-4:IL06 **Synthesis and Properties of MXene Composites via Solution Processing or/and Interfacial Functionalization**
GUOBING YING, Department of Materials Science and Engineering, College of Mechanics and Materials, Hohai University, Nanjing, China

CE-4:IL07 **Synthesis and Properties of MoAlB Solid Solution and SiC/MoAlB Composites**
SHIBO LI, JUNJI MOU, SHUANG WU, Center of Materials Science and Engineering, School of Mechanical and Electronic Control Engineering, Beijing Jiaotong University, Beijing, China

CE-4:L08 **Ti3AlC2-based Composites Processed via Additive Manufacturing Technologies**
M. KRINITCYN, Tomsk Polytechnic University, Tomsk and Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia

Session CE-5
ab initio calculations, electronic and magnetic properties

CE-5:IL01 **Contribution of Single Crystal Measurements to the Understanding of MAX Phase Electronic Properties**
T. OUISSE, D. PINEK, M. BARBIER, Y. KIM, Université Grenoble-Alpes, CNRS, LMGP, Grenoble, France; T. ITO, M. IKEMOTO, Nagoya University Synchrotron radiation Research Center (NUSR), Nagoya University, Nagoya, Japan; K. FURUTA, Graduate School of Engineering, Nagoya University, Nagoya, Japan; M. NAKATAKE, Aichi Synchrotron Radiation Center, Seto, Japan; K. YAJI, S. SHIN, Institute for Solid State Physics, University of Tokyo, Chiba, Japan; C. OPAGISTE, Université Grenoble-Alpes, Inst. NEEL, Grenoble, France; F. WILHELM, A. ROGALEV, European Synchrotron Radiation Facility (ESRF), Grenoble cedex, France

CE-5:IL02 **Microscopic Conductivity and Photoexcited Carrier Dynamics in MXenes**
GUANGJIANG LI[1], V. NATU[2], S. HUANG[3], T. SHI[1], N. AMER[4], H.A. HAFEZ[5], F.A. HEGMANN[4], D. TURCHINOVICH[5], V. MOCHALIN[3], M.W. BARSOUM[2], **L.V. TITOVA**[1], [1]Department of Physics, Worcester Polytechnic Institute, Worcester, MA, USA; [2]Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA; [3]Department of Chemistry and Department of Materials Science & Engineering, Missouri University of Science & Technology, Rolla, MO, USA; [4]Department of Physics, University of Alberta, Edmonton, AB, Canada; [5]Fakultät für Physik, Universität Bielefeld, Bielefeld, Germany

CE-5:L03 **Growth and Characterization of Epitaxial (Cr1-xMnx)2GaC MAX Phase Thin Films by Pulsed Laser Deposition**
H. PAZNIAK[1], M. FARLE[1,2], U. WIEDWALD[1], [1]Faculty of Physics and Center for Nanointegration (CENIDE), University of Duisburg-Essen, Duisburg, Germany; [2]Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk, Russia

CE-5:L04 **The Magnetic Structure of Rare Earth i-MAX Phases Explored by Neutron Diffraction and Muon Spin Rotation**
D. POTASHNIKOV, IAEC, Tel-Aviv, Israel; O. RIVIN, A. PESACH, E.N. CASPI, NRCN, Beer-Sheva, Israel; Q. TAO, J. ROSÉN, Linköping University, Sweden; D. SHEPTYAKOV, Z. SALMAN, PSI, Switzerland; C. RITTER, ILL, France; H.A. EVANS, NIST, USA; P. BONFÁ, University of Parma, Italy; T. OUISSE, M. BARBIER, University Grenoble-Alps, France; A. KEREN, Technion, Israel

CE-5:L05 **Non-collinear Antiferromagnetic Structure of the Mn2GaC Thin Film (MAX Phase) -evidenced by 55Mn NMR**
M. WOJCIK[1], E. JEDRYKA[1], J. DEY[1], R. KALVIG[1], U. WIEDWALD[2], R. SALIKHOV[2], M. FARLE[2], J. ROSEN[3], [1]Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; [2]Faculty of Physics and Center for Nanointegration (CENIDE), University of Duisburg-Essen, Duisburg, Germany; [3]Thin Film Physics, Department of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden

CE-5:IL06 **Electronic Structure of Some Selected MAX Phases**
TAKAHIRO ITO, Nagoya University Synchrotron radiation Research center (NUSR), Nagoya University, Nagoya, Japan; K. FURUTA, Graduate School of Engineering, Nagoya University, Nagoya, Japan; D. PINEK, Y.-S. KIM, M. BARBIER, T. OUISSE, Université Grenoble-Alpes, CNRS, LMGP, Grenoble, France; M. NAKATAKE, Aichi Synchrotron Radiation Center, Seto, Japan; S. IDETA, K. TANAKA, Institute for Molecular Science, Okazaki, Japan; P. LE FÉVRE, F. BERTRAN, Synchrotron-SOLEIL, L'Orme des Merisiers, Saint-Aubin, France

CE-5:IL07 **Magnetism in MAX and MAB Phases**
E.N. CASPI, Nuclear Research Centre - Negev, Beer-Sheva, Israel

CE-5:L08 **Quantitative MXene Spectroscopy in TEM using ab initio Simulations**
T. BILYK[1], H.-W. HSIAO[2], R. YUAN[2], M. BUGNET[3], M.-L. DAVID[1], S. CÉLÉRIER[4], J.-M. ZUO[2], J. PACAUD[1], **V. MAUCHAMP**[1], [1]Pprime Institute –UPR 3346– CNRS, Poitiers University, ISAE-ENSMA, Department of Physics and Mechanics of Materials, Futuroscope-Chasseneuil, France; [2]Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA; [3]Université de Lyon, INSA Lyon, UCBL Lyon 1, MATEIS–UMR 5510 CNRS, Villeurbanne, France; [4]Institut de Chimie des Milieux et Matériaux de Poitiers (IC2MP), CNRS, Poitiers University, Poitiers, France

CE-5:L09 **Energy Resolved Contributions of the Functionalization Groups on the Valence Band Spectra of the T3C2Tx MXene**
F. BRETTE[1, 2], H. PAZNIAK[1], R. LARCIPRETE[3], A. LIEDL[4], P. LACOVIG[5], D. LIZZIT[5], E. TOSI[5], F. BOUCHER[2], V. MAUCHAMP[1], [1]Institut Pprime, Poitiers, France; [2]Institut des Matériaux Jean Rouxel (IMN), Nantes, France; [3]CNR-Institut for Complex Systems (ISC), Italy; [4]INFN-LNF, Italy; [5]Elettra-Sincrotrone Trieste, Italy

Session CE-6
Functional properties of MAX/MAB/MXenes

CE-6:IL01 **Stoichiometry and Atomic Surface Structure Engineering of MAX/MXenes for Electrocatalysis**
J. SNYDER, M. BARSOUM, S. INTIKHAB, V. NATU, Drexel University, Philadelphia, PA, USA

CE-6:IL02 **Water in MXene and Negative Dielectric Constants**
MASASHI OKUBO, ATSUO YAMADA, The University of Tokyo, Tokyo, Japan

CE-6:IL03 **Assembling Multilayered and Heterolayered MXenes and 3D Printing of MXene Devices Electrodes for Energy Storage**
M. BEIDAGHI, Department of Mechanical and Material Engineering, Auburn University, Auburn, AL, USA

CE-6:IL04 **MXene Chemistry: Fundamentals and Applications**
V.N. MOCHALIN, Department of Chemistry and Department of Materials Science & Engineering, Missouri University of Science & Technology, MO, USA

CE-6:IL05 **MXene Hydrogels for Flexible Supercapacitors**
JING MA, WEI ZHANG, PEIGEN ZHANG, WEI HE, **ZHENGMING SUN**, School of Materials Science and Engineering, Southeast University, Nanjing, China

CE-6:L06 **Electrochemical Investigation on Anti-corrosion Behavior of Functionalized 2D Mxene Reinforced Powder Coating Nanocomposites**
Z. NAZARLOU, U. AYDEMIR, Department of Chemistry, Koç University, Sariyer, Istanbul, Turkey; M.S.S. DORRAJI, Department of Chemistry, University of Zanjan, Zanjan, Iran

Session CE-7
Applications of the MAX/MAB and MXene phases

CE-7:L01 **MXene for Electrochemical Water Desalination**
M. TORKAMANZADEH, L. WANG, Y. ZHANG, INM - Leibniz Institute for New Materials, Saarbrücken, Germany; Saarland University, Saarbrücken, Germany; V. PRESSER, INM - Leibniz Institute for New Materials, Saarbrücken, Germany. Saarland University, Saarbrücken, Germany. Saarene - Saarland Center for Energy Materials and Sustainability, Saarbrücken, Germany

CE-7:IL02 **Highly Conductive MXene for Electronics: From Fundamental to Applications**
SHUN SAKAIDA, F. NARUSE, T. TORITA. Murata Manufacturing Co., Ltd., Shiga, Japan

CE-7:IL03 **Pre-Intercalated Multi-layer MXenes as Outstanding Electrodes for Electrochemical Energy Storage**
KUN LIANG, K. PRENGER, **M. NAGUIB**, Department of Physics and Engineering Physics, Tulane University, New Orleans, Louisiana, USA

CE-7:IL04 **MAX Phases for Nuclear Applications**
K. LAMBRINOU[1, 2], B. TUNCA[3], K. VAN LOO[3], J. VLEUGELS[3], R.-W. BOSCH[1], M. TO BABEN[4], S. MRÁZ[5], J.M. SCHNEIDER[5], M. GROSSE[6], J.A. HINKS[2], P.O.Å. PERSSON[7], [1]SCK•CEN, Mol, Belgium; [2]School of Computing & Engineering, University of Huddersfield, Huddersfield, UK; [3]Department of Materials Engineering, KU Leuven, Leuven, Belgium; [4]GTT-Technologies, Aachen, Germany; [5]Materials Chemistry, RWTH Aachen University, Aachen, Germany; [6]Institute for Applied Materials - Applied Materials Physics, KIT, Eggenstein-Leopoldshafen, Germany; [7]Department of Physics, Chemistry and Biology, Linköping University, Linköping, Sweden

CE-7:IL05 **Tuning the MXene Surface Chemistry with the Etching Agent. Application in Electrocatalysis**
M. BENCHAKAR, L. LOUPIAS, C. CANAFF, S. MORISSET, C. MORAIS, A. HABRIOUX, **S. CÉLÉRIER**, IC2MP, Poitiers, France; T. BILYK, J. PACAUD, P. CHARTIER, V. MAUCHAMP, Pprime, Poitiers, France

SYMPOSIUM CF
ADVANCES IN FUNCTIONAL MATERIALS FOR ENERGY HARVESTING, STORAGE AND SOLAR FUELS

Session CF-1
Innovative processing of nano- and heterostructured functional materials

CF-1:IL01 **Nano-structured Oxide Sponges; From Precursor to Complex Oxides**
G. WESTIN, S.N. KATEA, Department of Chemistry-Ångström, Ångström laboratory, Uppsala, Sweden

CF-1:IL02 **Metal-organic Frameworks-based Biocomposites: Design, Synthesis and Biomedical Applications**
P. FALCARO, Graz University of Technology, Institute of Physical and Theoretical Chemistry, Graz, Austria

CF-1:IL03 **Structure of the Electrical Double Layer at the Interface between Ionic Liquids and Metal Oxides for Energy Harvesting**
C. SANTATO, Polytechnique Montreal, Canada; M. BARBOSA, UNESP, Brazil; F. SOAVI, F. POLI, University of Bologna, Italy; N. BALKE, Oak Ridge National Lab, USA

CF-1:IL04 **Nanostructuring and Nanocomposites in Thermoelectric Oxides**
F. GIOVANNELLI, C. CHEN, F. DELORME, Université de Tours, CNRS, INSA CVL, GREMAN UMR 7347, IUT de Blois, Blois Cedex, France

CF-1:IL05 **Advances in the Tailored Fabrication of Metal-oxide Nanoarchitectures for Safety, Environmental Applications and Sustainable Technologies**
D. BARRECA[1], A. GASPAROTTO[2], L. BIGIANI[2], C. MACCATO[2], [1]CNR-ICMATE and INSTM, Department of Chemical Sciences, Padova University, Padova, Italy; [2]Department of Chemical Sciences, Padova University and INSTM, Padova, Italy

CF-1:IL06 **Nanostructures and Thin Films of Tetragonal Tungsten Bronze Complex Oxides**
V. DEMANGE, B. ASPE, A. WAROQUET, V. DORCET, M. GUILLOUX-VIRY, ISCR, France; Q. SIMON, GREMAN, Blois, France; B. GAUTIER, D. ALBERTINI, INL, Lyon, France; R. SAULEAU, X. CASTEL, IETR, Rennes, France

CF-1:IL07 **Multifunctional Nanomaterials for Clean Environmental and other Applications**
D.H.C. CHUA, National University of Singapore, Department of Materials Science and Engineering, Singapore

CF-1:IL08 **Carbon Dots - From Synthesis to Application in Imaging, Sensing and Catalysis**
R. NACCACHE, Department of Chemistry and Biochemistry Concordia University Montreal, Quebec, Canada

CF-1:IL09 **Novel Monoxide Gas Sensor with Catalyst Based on Platinum-loaded Oxide Ion Conducting Solids**
NOBUHITO IMANAKA, Department of Applied Chemistry, Faculty of Engineering, Osaka University, Suita, Osaka, Japan

CF-1:L10 **Carbon Nanotube Coating from Electrophoretic Deposition Designed for Photo thermal Solar Receptors**
F. DIDIER, X. DESCHANELS, G. TOQUER, ICSM, Univ Montpellier, CEA, CNRS, ENSCM, Marcoule, France

CF-1:L11 **Molten Salt Flux Synthesis of Defective CaSnO3 with Tailoring Morphology and Enhanced Photocatalytic Activity**
JINGWEN WANG, TAKUYA HASEGAWA, SHU YIN, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; YUSUKE ASAKURA, Kagami Memorial Research Institute for Materials Science and Technology, Waseda University, Tokyo, Japan

CF-1:L12 **Novel MOCVD Deposition Strategies to Obtain Thin Films with Improved Functional Properties**
M. BURRIEL[1], R. RODRIGUEZ-LAMAS[1], A. STANGL[1], A. RIAZ[1, 3], C. PIROVANO[2], L. RAPENNE[1], E. SARIGIANNIDOU[1], D. PLA[1], O. CHAIX-PLUCHERY[1], M. MERMOUX[3], R.-N. VANNIER[2], C. JIMÉNEZ[1], [1]Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; [2]Univ. Lille, CNRS, Centrale Lille, ENSCL, Univ. Artois, UMR 8181 - UCCS - Unité de Catalyse et Chimie du Solide, Lille, France; [3]Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, Grenoble, France

CF-1:L13 **Process Design for Continuous Supercritical Hydrothermal Synthesis Process and the Materials Design**
TADAFUMI ADSCHIRI, A. YOKO, G. SEONG, T. TOMA, Tohoku University, Sendai, Miyagi, Japan

CF-1:IL14 **Advanced Fluoride Films for Energy Conversion**
A.L. PELLEGRINO[1], A. SPEGHINI[2], **G. MALANDRINO**[1], [1]Dipartimento di Scienze Chimiche, Università di Catania and INSTM UdR Catania, Catania, Italy; [2]Nanomaterials Research Group, Dipartimento di Biotecnologie, Università di Verona and INSTM, UdR Verona, Verona, Italy

CF-1:IL15 **2D Molybdenum Dichalcogenides Prepared by Atomic Layer Deposition**
R. ZAZPE[1, 2], J. CHARVOT[3], L. HROMADKO[1, 2], H. SOPHA[1, 2], F. BUREŠ[3], **J.M. MACAK**[2], [1]Center of Materials and Nanotechnologies, Faculty of Chemical Technology, University of Pardubice, Pardubice, Czech Republic; [2]Central European Institute of Technology, Brno University of Technology, Brno, Czech Republic; [3]Institute of Organic Chemistry and Technology, Faculty of Chemical Technology,University of Pardubice, Pardubice, Czech Republic

CF-1:IL16 **Lithium Niobate Thin Films for Vibrational Harvesting**
S.MARGUERON, G. CLEMENTI, M. OUHABAZ, M. COSTANZA, B. DULMET, A. BARTASYTE, UBFC UFC ENSMM CNRS, Institut FEMTO-ST, Besançon, France

CF-1:IL17 **Functional Nanocomposites Based Highly Stable and Efficient Perovskite Solar Cells**
YOON-BONG HAHN, School of Semiconductor and Chemical Engineering, Jeonbuk National University, Jeonju, South Korea

CF-1:IL18 **Processable Polymeric Carbon Nitride for Photoelectrochemical Applications**
I. KRIVTSOV, Institute of Electrochemistry, Ulm University, Germany

CF-1:IL19 **Radially-heterostructured III-V Nanowires for Photonics and Photovoltaics**
P. PRETE, IMM-CNR, Lecce, Italy; N. LOVERGINE, Dept. of Engineering for Innovation, University of Salento, Lecce, Italy

CF-1:IL20 **Nano-hybridization of Low-dimensional Titania Nanotubes and their Photo- and Physicochemical Functions**
TOHRU SEKINO, The Institute of Scientific and Industrial Research, Osaka University, Ibaraki, Osaka, Japan

CF-1:L21 **Photocatalytic Self-cleaning Properties of Developed TiO2 Doped Layered Double Hydroxide in Comparison to the Commercially Available Solutions for Application on Mineral Substrates**
B. MILJEVIC[1], J.M. VAN DER BERGH[2], S. VUČETIĆ[1], J. RANOGAJEC[1], R. CERC KOROŠEC[3], [1]University of Novi Sad, Faculty of Technology, Novi Sad, Serbia; [2]Liverpool John Moores University, Built Environment and Sustainable Technologies (BEST) Research Institute, Liverpool, UK; [3]University of Ljubljana, Faculty of Chemistry and Chemical Technology, Ljubljana, Slovenia

CF-1:L22 **Ag/Ce0.9Gd0.1O2-d based Vertically Aligned Nanocomposite Thin Film Electrodes for Low-temperature Solid Oxide Cells**
O. CELIKBILEK[1, 2], M.P. WELLS[3], J.L. MACMANUS-DRISCOLL[3], G. KERHERVE[2], L. RAPENNE[1], M. CESAR STEIL[4], E. SIEBERT[4], D. MUÑOZ-ROJAS[1], M. BURRIEL[1], S.J. SKINNER[2], [1]Univ. Grenoble Alpes, CNRS, Grenoble INP¥, LMGP, Grenoble, France ¥ Institute of Engineering Univ. Grenoble Alpes; [2]Department of Materials, Imperial College London, London, UK; [3]Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, UK; [4]Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, Grenoble, France

CF-1:L23 **Highly Efficient Photoelectrochemical Reaction of MoS2 Nanosheets Utilizing Vertical 2D/2D Heterojunctions**
DONG-BUM SEO, SUNG-SOO BAE, ROSHANI AWANTHIKA JAYARATHNA, EUI-TAE KIM, Department of Materials Science & Engineering, Chungnam National University, Daejeon, South Korea

Session CF-2

Functional metal oxide nano- and heterostructures for photovoltaics and solar fuels

CF-2:IL01 **Solution-based Green Processing of Hybrid Perovskites for Solar Cell Applications**
F. ÜNLÜ[1], T. FISCHER[1], A. KULKARNI[2], T. MIYASAKA[2], **S. MATHUR**[1], [1]Institute of Inorganic Chemistry, University of Cologne, Cologne, Germany; [2]Graduate School of Engineering, Toin University of Yokohama, Aoba, Yokohama, Kanagawa, Japan

CF-2:IL02 **Rational Material Requirements for a Feasible Industrial Production of Solar Fuels using Electroconversion Procedures**
J.R. MORANTE, IREC, Sant Adrià del Besòs, Spain & University of Barcelona, Physics Faculty, Barcelona, Spain

CF-2:IL03 **Novel Photoanodes for Solar Fuels**
S. ESLAVA, M. REGUE, D. WALSH, J. ZHANG, I. POLI, U. HINTERMAIR, P.J. CAMERON, Imperial College London, London, UK

CF-2:IL04 **Transport Processes at the Surfaces and Interfaces of Photoelectrodes in PEC Reactors**
A. BRAUN, Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland

CF-2:IL05 **Understanding the Role of Grain Boundary in Metal Oxide for Improving Solar Conversion**
E.R. LEITE, LNNano-CNPEM, Campinas, SP; Federal University of São Carlos São Carlos, Chemistry Department, São Carlos, SP, Brazil

CF-2:IL06 **Boosting of Photo-induced Charge Carrier Dynamics in Semiconducting Systems**
R. SOLARSKA, K. BIENKOWSKI, Centre of New Technologies, University of Warsaw, Warsaw, Poland

CF-2:IL07 **Interfacial Properties in Composite Nano-systems for Energy Harvesting**
A. VOMIERO, Division of Materials Science, Dept. of Engineering Sciences and Mathematics, Luleå University of Technology, Luleå, Sweden, and Department of Molecular Sciences and Nanosystems, Venezia Mestre, Italy

CF-2:IL08 **Latest Advances in Heteronanostructures for Solar Water Splitting**
L. VAYSSIERES, International Research Center for Renewable Energy, Xian Jiaotong University, China

CF-2:IL09 **Mesoporous Complex Oxides for Solar Fuels Generation**
R. MARSCHALL, University of Bayreuth, Bayreuth, Germany

CF-2:IL10 **Semiconducting Metal Oxide Nanostructures for Water Splitting and Photovoltaics**
I. CONCINA, Luleå University of Technology, Luleå, Sweden

CF-2:L11 **Study of Charge Carrier Dynamics in TiO2 Thin Films by Time Resolved Transient Absorption Spectroscopy**
RAMSHA KHAN, H. ALI-LÖYTTY, A. TUKIAINEN, N.V. TKACHENKO, Photonic Compounds and Nanomaterials Group, Faculty of Engineering and Natural Sciences, Tampere University, Tampere, Finland

CF-2:IL12 **TiO2 Based Photocatalyst: Controllable Synthesis and Applications in Benzene Degradation**
PENG SUN, JUN ZHANG, WENXIU LIU, **WENBIN CAO**, School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China

CF-2:L13 **Investigation of Tungsten Oxides for Solar Hydrogen Production and Oxygen Evolution**
B. HUANG, **J.N. HART**, School of Materials Science and Engineering, UNSW Sydney, NSW, Australia

CF-2:L14 **Incorporation of Spark Ablation and Nanoscale 3D Printing for Deriving Nanostructured Layers**
I. PANZIC[1], A. JELINEK[2], F. RADOVANOVIĆ-PERIĆ[1], D. KIENER[2], V. MANDIĆ[1], [1]Faculty of Chemical Engineering and Technology, Zagreb, Croatia; [2]Department of Materials Physics, Montanuniversität Leoben, Leoben, Austria

CF-2:IL15 **Photocatalyst Design Via Low-cost Chemical Process Toward Large Scale Production**
F.L. DE SOUZA, Laboratory National of Nanotechnology (LNNano), Brazilian National Center for Research in Energy and Materials (CNPEM), Campinas, Brazil

CF-2:L16 **Titania Thin Films, Photocatalytically Efficient Under Visible Light Illumination**
B. ŽENER, L. MATOH, **R. CERC KOROŠEC**, Faculty of Chemistry and Chemical Technology, University of Ljubljana, Ljubljana, Slovenia

Session CF-3
Recent developments in photovoltaic materials

CF-3:IL01 **Advances in Multijunction Photovoltaics for Solar and Monochromatic Light Applications**
K. HINZER, University of Ottawa, Ottawa, Canada

CF-3:IL02 **Advancing Organic Semiconductors for Robust Solar Fuel Production**
K. SIVULA, Laboratory for Molecular Engineering of Optoelectronic Nanomaterials (LIMNO), École Polytechnique Fédérale de Lauanne (EPFL), Lausanne, Switzerland

CF-3:L03 **Implementing Ordered Arrays of Zincite Nanoformations into Transport Layers of Perovskite Photovoltaic Devices**
V. MANDIĆ, I. PANŽIĆ, F. RADOVANOVIĆ-PERIĆ, Faculty of Chemical Engineering and Technology, Zagreb, Croatia; T. RATH, Institute for Chemistry and Technology of Materials, Graz, Austria

CF-3:IL04 **Materials Challenges for Hot-carrier Solar-cells**
H. ISMAELPOUR, M. GITEAU, D. SUCHET, **J.F. GUILLEMOLES**, IPVF, UMR CNRS 9006, Palaiseau, France & NextPV, University of Tokyo, Japan

CF-3:IL05 **Defects Activity in Wide and Narrow Bandgap Metal Halide Perovskite Semiconductors**
A. PETROZZA, Center for Nano Science and Technology @Polimi, Istituto Italiano di Tecnologia, Milan, Italy

CF-3:IL06 **Polymorphous Halide Perovskites: Structural and Entropic Considerations**
G. MARTINI DALPIAN, Center for Human and Natural Sciences, Federal University of ABC, Santo André, SP, Brazil

SYMPOSIUM CG
CERAMIC THIN FILMS AND COATINGS FOR PROTECTIVE, TRIBOLOGICAL AND MULTIFUNCTIONAL APPLICATIONS

Session CG-1
Thin film deposition

CG-1:IL01 **Ionized and Hybrid Plasma Deposition Processes**
H. BARANKOVA, L. BARDOS, Angstrom Laboratory, Uppsala University, Sweden and BB Plasma Design AB, Uppsala, Sweden

CG-1:L02 **Deposition of Ge-Sb-Te Thin Films by Radio-frequency Magnetron Co-sputtering**
M. BOUŠKA[1], T. HALENKOVIČ[1], V. NAZABAL[2, 1], M. BAILLIEUL[1], J. GUTWIRTH[1], M. KOTRLA[1], **P. NEMEC**[1], [1]Department of Graphic Arts and Photophysics, Faculty of Chemical Technology, University of Pardubice, Pardubice, Czech Republic; [2]Institut des Sciences Chimiques de Rennes, UMR CNRS 6226, Université de Rennes 1, Rennes, France

CG-1:IL03 **New Surface Boriding Technologies**
M. MEJAUSCHEK, H. PASCHKE, M. WEBER, C. HERRMANN, Fraunhofer Institute for Surface Engineering an Thin Films IST, Braunschweig, Germany; P. KAESTNER, J. VOGTMANN, Institute for Surface Technology, Braunschweig, Germany

CG-1:L04 **Plasma Electrolytic Oxidation for the Formation of Thin Primer Coatings on Structural Aluminium Components for Automotive Applications**
D. SHORE[1], J.C. AVELAR-BATISTA WILSON[2], A. MATTHEWS[1], A. YEROKHIN[1], [1]Department of Materials, The University of Manchester, Oxford Road, Manchester, UK; [2]BCW Manufacturing Group Ltd, Burnley, Lancashire, UK

CG-1:L05 **Dynamic Voltammetry Diagnostics of Electrolytic Plasma Processes for Deposition of Ceramic Coatings of Valve Metal Substrates**
A. YEROKHIN, Department of Materials and Henry Royce Institute for Advanced Materials and Innovation, University of Manchester, UK

CG-1:L06 **Oxidation Resistance of SiAlOC Coated Chromium**
N.C. PETRY[1], M. BIK[2], A.S. ULRICH[1], M. SITARZ[2], M. LEPPLE[1], M.C. GALETZ[1], [1]DECHEMA-Forschungsinstitut, Frankfurt am Main, Hesse, Germany; [2]AGH University of Science and Technology, Krakow, Poland

CG-1:L07 **Binder Free Boron Nitride-based Coatings Deposited on Mild Steel by Chemical Vapour Deposition: Anti-corrosion Performance Analysis**
A. NADEEM[1], M. FAHEEM MAQSOOD[1, 2], M. ALI RAZA[1], [1]Institute of Metallurgy & Materials Engineering, Faculty of Chemical & Materials Engineering, University of the Punjab, Lahore, Pakistan; [2]Faculty of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, South Korea

CG-1:L08 **Nitrogen Effects on Structure and Mechanical Properties of AISI 304 Austenitic Stainless Steel and Chromium Nitride Films**
F.I. ALRESHEEDI, Department of Physics, Qassim University, Qassim, Saudi Arabia

CG-1:L09 **Advanced Iron Boride Coatings for Geothermal Power Generation**
E. MEDVEDOVSKI[1], G. LEAL MENDOZA[1], **G. RAVIER**[2], A. GENTER[2], [1]Endurance Technologies Inc.; [2]ES Geothermie, Mundolsheim, France

Session CG-2
Thin film attributes

CG-2:IL01 **Self-Lubricating PVD Coatings for Components and Tools**
K. BOBZIN, **C. KALSCHEUER**, Surface Engineering Institute (IOT), RWTH Aachen University, Aachen, Germany

CG-2:L02 **Direct Liquid Injection Chemical Vapor Deposited Zirconium Oxide-based Corrosion Barriers on Low-alloy Steels**
A. JAUD, D. SAMÉLOR, D. SADOWSKI, C. VAHLAS, CIRIMAT (Centre Inter-universitaire de Recherche et d'Ingénierie des Matériaux) - CNRS, Université de Toulouse, Toulouse Cedex, France; S. PONTON, H. VERGNES, B. CAUSSAT, LGC (Laboratoire de Génie Chimique) - CNRS, Université de Toulouse, Toulouse Cedex, France; A. ABDEL AAL, J. ETZKORN, Chemistry and Materials Engineering, Fachhochschule Dortmund, Dortmund, Germany

CG-2:L03 **Investigation of the Tribological and Operational Properties of (Mex,Moy,Al1-(x+y))N (Me –Ti, Zr or Cr) Coatings**
A. VERESCHAKA, Institute of Design and Technological Informatics of the Russian Academy of Sciences (IDTI RAS), Moscow, Russia; F. MILOVICH, National University of Science and Technology MISiS, Moscow, Russia; M. MIGRANOV, Moscow State Technological University Stankin; N. ANDREEV, National University of Science and Technology MISiS, Moscow, Russia

CG-2:L04 **High-rate Magnetron Sputtering of CrNx Coatings Enhanced by a Radio-frequency Inductively Coupled Plasma**
D.V. SIDELEV, V.A. GRUDININ, G.A. BLEYKHER, V.P. KRIVOBOKOV, Tomsk Polytechnic University, Tomsk, Russia

CG-2:IL05 **Synergy of Tool Material and Hard Coating for Optimized Performance in Industrial Tooling Applications**
F. NAHIF, voestalpine eifeler Vacotec GmbH, Düsseldorf, Germany

CG-2:IL06 **The Properties and Features of Formation of Ultrathin Diamond Films**
P. SOROKIN, National University of Science and Technology MISiS, Russia

CG-2:IL07 **How to Make Diamond-like Carbon Stable: An In Situ XPS and NEXAFS Investigation of Thermally-induced Structural Evolution of Amorphous Carbon Surfaces**
F. MANGOLINI, The University of Texas at Austin, Austin, TX, USA; J.B. McCLIMON, J. HILBERT, J.R. LUKES, R.W. CARPICK, University of Pennsylvania, Philadelphia, PA, USA

CG-2:IL08 **Structure Effects on the Aging, Surface Chemistry and Friction Performance of Composite MoS2 Thin Films**
M.T. DUGGER, J.F. CURRY, N.S. BOBBITT, M.E. CHANDROSS, Materials, Physical and Chemical Sciences Center, Sandia National Laboratories, Albuquerque, NM, USA

CG-2:IL09 **Characterisation of Plasma and Surface Modification of Multi-element Arc Cathodes for Coating Deposition**
R. FRANZ, Department of Materials Science, Montanuniversität Leoben, Leoben, Austria

CG-2:IL10 **Duplex PEO/TMD Composite Coatings for Aluminum Alloys**
A. VOEVODIN[1], A. SHIRANI[1], D. BERMAN[1], A. YEROKHIN[2], A. KORENYI-BOTH[3], T.W. LISKIEWICZ[4], S.M. AOUADI[1], J.-E. MOGONYE[5], S. BERKEBILE[5], [1]University of North Texas, Denton, Texas, USA; [2]University of Manchester, Manchester, UK; [3]Colorado School of Mines, Golden, Colorado, USA; [4]Manchester Metropolitan University, Manchester, UK; [5]U.S. DEVCOM Army Research Laboratory, Aberdeen Proving Ground, Maryland, USA

CG-2:IL11 **Multicomponent Ceramic Coatings and Related Antibacterial Mechanisms**
D.V. SHTANSKY[1], V.A. PONOMAREV[1], K.Y. GUDZ[1], A.N. SHEVEYKO[1], E.S. PERMYAKOVA[1], A.M. MANAKHOV[1], S.G. IGNATOV[2], N.A. GLOUSHANKOVA[3], [1]National University of Science and Technology "MISIS", Moscow, Russia; [2]State Research Center for Applied Microbiology and Biotechnology, Obolensk, Moscow Region, Russia; [3]N.N. Blokhin National Research Medical Center of Oncology, Moscow, Russia

CG-2:IL12 **Ceramic Thin Films for MEMS and Sensors Applications**
J. PATSCHEIDER, C.V. FALUB, M. TSCHIRKY, B. HEINZ, A. MAZZALAI, H. ROHRMANN, Evatec AG, Trübbach, Switzerland

CG-2:IL13 **Multifunctional Nitride and Oxide Thin Film for Thermo-electrics and Energy Harvesting**
P. EKLUND, Energy Materials Unit, Thin Film Physics Division, Dept. of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden

CG-2:L14 **TiN/NbN Superlattice Coatings Deposited by High Power Impulse Magnetron Sputtering Potential Candidate to Protect Medical Grade CoCrMo Alloys**
P.Eh. HOVSEPIAN, A.A. SUGUMARAN, A.P. EHIASARIAN, National HIPIMS Technology Centre, Sheffield Hallam University, UK; I. KHAN, Zimmer-Biomet UK Limited, Dorcan Industrial Estate, Swindon, UK

Session CG-3
Thick film, suspension spray and tribology

CG-3:IL01 **Ceramic Superhydrophobic Coatings by Solution Precursor Plasma Spray**
T.W. COYLE, P. XU, J. MOSTAGHIMI, Centre for Advanced Coating Technologies, University of Toronto, Toronto, ON, Canada

CG-3:IL02 **Suspension Flame Sprayed Metal Doped Calcium Phosphate Coatings with Antibacterial Properties for Infection Prophylaxis**
R. GADOW[1], A. KILLINGER[1], A. BERNSTEIN[2], M. BLUM[1], [1]Institute for Manufacturing Technologies of Ceramic Components and Composites, University of Stuttgart, Stuttgart, Germany: [2]Musculoskeletal research lab, Clinics of Orthopedics and Trauma Surgery, University of Freiburg, Freiburg, Germany

CG-3:L03 **The Effect of Feed Rate and Precursor Concentration on the Thickness of Flame-made Al2O3-based TiO2 Coatings**
B. GUNHAN[1], H.B. POYRAZ[2], I.O. OZER[2], G. KAYA[1], [1]Kutahya Dumlupinar University, Kutahya, Turkey; [2]Eskisehir Technical University, Eskisehir, Turkey

CG-3:IL04 **Thermal Spraying with Suspensions for Tribological Applications**
S. BJÖRKLUND, S. MAHADE, **S. JOSHI**, University West Trollhättan, Trollhättan, Sweden

CG-3:IL05 **Mechanism of Room Temperature Impact Consolidation (RTIC) on Aerosol Deposition**
JUN AKEDO, K. SHINODA, R. AOYAGI, Y. MATSUBAYASHI, National Institute of Advanced Industrial Science & Technology, Tsukuba, Ibaraki, Japan

CG-3:IL06 **Hybrid Aerosol Deposition**
KENTARO SHINODA, JUN AKEDO, Advanced Coating Technology Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

CG-3:IL07 **Developments in Cold Spray Coatings and 3D Material Architecture**
G.C. SAHA, Nanocomposites and Mechanics Laboratory, University of New Brunswick, Fredericton, New Brunswick, Canada

CG-3:IL08 **The New Frontier in Liquid Feedstock HVOF Thermal Spray: Porosity with Neutron Scattering and Performance of TBCs**
T. HUSSAIN, D. TEJERO-MARTIN, A. RINCON ROMERO, A. LYNAM, Coatings and Surface Engineering, Faculty of Engineering, University of Nottingham, Nottingham, UK

CG-3:IL09 **Superlubricity and Superior Wear Resistance of 2D Materials: Recent Developments and Future Prospects**
A. ERDEMIR, Texas A&M University, Mechanical Engineering Department, College Station, TX, USA

CG-3:IL10 **Status of Thermally Sprayed Hardmetal Coatings**
L.-M. BERGER, Fraunhofer IKTS, Dresden, Germany

CG-3:IL11 **Tribological Behavior of Hard Metal Thermal Spray Coatings**
G. BOLELLI, L. LUSVARGHI, P. PUDDU, L. LUSVARGHI, V. TESTA, Dipartimento di Ingegneria "Enzo Ferrari", Università di Modena e Reggio Emilia, Modena, Italy; P. SASSATELLI, Il Sentiero International Campus S.r.l., Schio (VI), Italy

CG-3:IL12 **Modeling the Tribological Behavior of Ceramic and Composite Coatings**
T. SUHONEN, A. LAUKKANEN, T. ANDERSON, T. PINOMAA, M. LINDROOS, J. METSÄJOKI, K. HOLMBERG, H. RONKAINEN, VTT Technical Research Centre of Finland, Espoo, Finland

Session CG-4
Thermal and environmental barrier coatings

CG-4:IL01 **Coatings for Protection of Aero Engine Components**
U. SCHULZ, German Aerospace Center, Institute of Materials Research Linder Hoehe, Cologne, Germany

CG-4:IL02 **Design Challenges in Advanced Gas Turbine Coatings**
C.G. LEVI, Materials Department, University of California, Santa Barbara, CA, USA

CG-4:IL03 **Environmental Barrier Coatings made by Atmospheric Plasma Spraying (APS)**
R. VASSEN, D. ZHOU, E. BAKAN, Forschungszentrum Jülich GmbH, IEK-1, Jülich, Germany

CG-4:IL04 **Advanced Suspension Plasma Sprayed Thermal Barrier Coatings**
M. GUPTA, University West, Trollhättan, Sweden; X.-H. LI, Siemens Energy, Finspång, Sweden; B. KJELLMAN, GKN Aerospace, Trollhättan, Sweden

CG-4:IL05 **Failure of Thermally Sprayed 7YSZ Coatings during Cyclic Loading of Microcantilevers**
D. LAL[1], P. KUMAR[1], S. SAMPATH[2], **V. JAYARAM**[1], [1]Department of Materials Engineering, Indian Institute of Science, Bangalore, India; [2]Centre for Thermal Spray Research, University of Stony Brook, NY, USA

CG-4:IL06 **Characterisation of Thermal and Environmental Barrier Coatings for Lifetime Extension**
PING XIAO, University of Manchester and Henry Royce Institute, Manchester, UK

CG-4:IL07 **Burner Rig Tests of Environmental Barrier Coatings for SiC/SiC CMCs**
E. BAKAN, D.E. MACK, D. ZHOU, Forschungszentrum Jülich, Institute of Energy and Climate Research IEK-1, Jülich, Germany; D. KOCH, University of Augsburg, Institute of Materials Resource Management, Augsburg, Germany; R. VASSEN, Forschungszentrum Jülich, Institute of Energy and Climate Research IEK-1, Jülich,

CG-4:IL08 **Advanced Sand/CMASphobic Thermal and Environmental Barrier Coatings Research**
A. GHOSHAL, US Army Research Laboratory, Aberdeen Proving Ground, MD, USA

CG-4:IL09 **Compositional and Structural Stability of Compositionally Complex Rare-Earth Oxides Under Thermal and Corrosion Exposures**
N. MOTLEY, **D.R. MUMM**, University of California at Irvine, Irvine, CA, USA

CG-4:L10 **Corrosion of EBCs by CMAS: Reactivity of Rare-earth Silicates**
J. BONNAL, C. PETITJEAN, PJ. PANTEIX, Université de Lorraine, CNRS, IJL, Nancy, France; S. ARNAL, E. BOUILLON, Safran Ceramics, Mérignac, France; M. VILASI, Université de Lorraine, CNRS, IJL, Nancy, France

CG-4:L11 **Design and Testing of Environmental Barrier Coatings for SiC/SiC-CMCs without Silicon Bond Coat based on Slurry Deposition**
A. NOETH, J. MAIER, J. VOGT, Fraunhofer-Institute for Silicate Research ISC/ Center for High-Temperature Materials and Design HTL, Bayreuth, Germany

CG-4:IL12 **Multilayerered, Multifunctional Thermo-structural coatings Enabled by Layered Manufacturing**
S. SAMPATH, Center for Thermal Spray Research Stony Brook University, Stony Brook, NY, USA

SYMPOSIUM CH

POROUS CERAMICS FOR ENVIRONMENTAL PROTECTION, ENERGY-RELATED TECHNOLOGIES AND ADVANCED INDUSTRIAL CYCLES

Session CH-1

Novel processing and synthesis of porous ceramics

CH-1:IL01 **Increased Porosity and Inner Strut Accessibility in Reticulated Ceramic Foams**
M. SCHEFFLER, Otto-von-Guericke University Magdeburg, Magdeburg, Germany

CH-1:IL02 **Room-temperature Fabrication and Nano-sized Hollow Structures for Porous Silica-based Ceramics**
YUKI NAKASHIMA, **MANABU FUKUSHIMA**, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Aichi, Japan

CH-1:IL03 **Colloidal Processing of Reticular Ceramic Foams with Reaction Sintered Secondary Minor Phases**
R. MORENO, C. ALCÁZAR, A. PEREIRA, J.C. FARIÑAS, E. ROSADO, Institute of Ceramics & Glass - CSIC, Madrid, Spain

CH-1:IL04 **Direct Ink Writing of Hierarchically Porous Geopolymeric Structures for Environmental Applications**
G. FRANCHIN, R. FUSS BOTTI, K. GOULART DE OLIVEIRA, M. D'AGOSTINI, G. ZANGARINI, P. COLOMBO, Dept. of Industrial Engineering, University of Padova, Padova, Italy

CH-1:IL05 **Surface and Inner Structure Control in Electrospun Ceramic Nanofibers**
G.S. GRADER, G.E. SHTER, O. ELISHAV, Technion – Israel Institute of Technology, Haifa, Israel

CH-1:IL06 **SiCN Ceramics Derived from Preceramic Photocurable and Diblock Polymers: Mesoporous Powder, 3D-printed Microreactor**
DONG-PYO KIM, Center for Intelligent Microprocess of Pharmaceutical Synthesis, Pohang University of Science and Technology (POSTECH), Pohang, South Korea

CH-1:IL07 **Freeze-casting and Additive Manufacturing of Polymer-derived Ceramics**
A. GURLO, Chair of Advanced Ceramic Materials, Technische Universitaet Berlin, German

CH-1:IL08 **Synthesis of 2D Layered Crystalline Ceramics with Controllable Nanotextures for Catalysis and Biomedical Applications**
YASUAKI TOKUDOME, Graduate School of Engineering, Osaka Prefecture University, Sakai, Japan

CH-1:IL09 **Porous Si3N4 ceramics prepared via SHS**
YUPING ZENG, YE ZHANG, State Key Laboratory of High Performance Ceramics and Superfine Microstructure, Shanghai Institute of Ceramics, CAS, Shanghai, China

CH-1:IL10 **Additive Manufacturing of Porous Ceramics for Separation Applications**
D. PENNER, ZHAW Zürich University of Applied Sciences; IMPE Institute of Materials and Process Engineering; Laboratory for Ceramic Materials; Winterthur, Switzerland

CH-1:IL11 **Sepiolite Based Catalyst Supports Produced by Combined Freeze-robocasting Technique**
J. GURAUSKIS, V. GIL HERNANDEZ, Hydrogen Foundation of Aragon, Huesca, Aragon, Spain; B. SIMONSEN, DTU Energy, Technical University of Denmark, Kgs. Lyngby, Denmark

CH-1:L12 **Elaboration of Ceramic Membranes based on Bentonite Clay and Iron ore from Tunisia for the Treatment of Textile Wastewater**
R. CHIHI[1], F. AYARI[1], M. TRABELSI AYADI[1], A. COMITE[2], C. COSTA[2], [1]Laboratory of Application of Chemistry to Natural Resources and Substances and the Environment (LACReSNE), Faculty of Sciences of Bizerte, Zarzouna, Bizerte, Tunisia; [2]Department of chemistry and Industrial Chemistry, University of Genoa, Genoa, Italy

Session CH-2

Adsorption, capillary phenomena, molecular thermodynamics of fluids and intermolecular interactions within the porous network

CH-2:IL01 **CO2 Absorption in Porous Geopolymers**
V. MEDRI, E. PAPA, E. LANDI, CNR-ISTEC Faenza, Italy; A. VACCARI, M. MINELLI, University of Bologna, Bologna, Italy

CH-2:IL02 **Structured Porous Ammonia Carriers for the Automotive Selective Catalytic Reduction (SCR) System**
F. AKHTAR, Division of Materials Science, Luleå University of Technology, Luleå, Sweden

CH-2:IL03 **Capillary Transport in Freeze Cast SiOC Ceramics**
D. SCHUMACHER[1], P. BRAUN[1], HUIXING ZHANG[1], M. DREYER[2], K. REZWAN[1, 3], **M. WILHELM**[1], [1]Advanced Ceramics, University of Bremen, Germany; [2]Applied space technology and microgravity, University of Bremen, Germany; [3]MAPEX-Centre for Materials and Processes, University of Bremen, Germany

CH-2:L04 **Analysis of Carbon Dioxide Ion Transport through Porous Insulating and Oxide Ion Conducting Ceramic Matrices**
R.L. DENALDI, **R. MUCCILLO**, Energy and Nuclear Research Institute, S. Paulo, Brazil

Session CH-3

Structure and functional, mechanical and thermal properties of porous ceramics

CH-3:IL01 **Hierarchical Porous SiC Ceramics with Core-shell Structure**
YOUNG-WOOK KIM, R. MALIK, Functional Ceramics Laboratory, Department of Materials Science and Engineering, The University of Seoul, Seoul, South Korea

CH-3:IL02 **Ceramic Foams with High Phonon Conductivity**
U. BETKE, D. CHAZARO MENDOZA, M. SCHEFFLER, Otto-von-Guericke-University Magdeburg, Magdeburg, Germany

CH-3:L03 **Fabrication of Ultra High Porosity Nanofibrous Ceramic Structures in Zirconia-Titania System**
R. YAGER, S. NEALY, R. DAY, C. SEVERINO, A. STANISHEVSKY, University of Alabama at Birmingham, Birmingham, AL, USA

CH-3:IL04 **Progress on Porous Ceramics for Heat-insulation**
CHANG-AN WANG, State Key Lab of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China

CH-3:IL05 **Mechanical Properties of Porous Ceramics: New Insights in Fracture and Crack Propagation Behaviour**
S. MEILLE, Université de Lyon, INSA de Lyon, Univ. Lyon 1, CNRS, MATEIS UMR5510, Villeurbanne, France

CH-3:IL06 **Polymer-derived Super Hydrophobic SiCH Inorganic-Organic Hybrid Membranes for Purification of Solar Hydrogen**
YUJI IWAMOTO, Nagoya Institute of Technology, Nagoya, Japan

CH-3:L07 **Chemical Composition Effect on a Hierarchical Nanoporous Layer Formation on a Silicate Glass**
TAKUYA FUJIMA, N. UEDA, A. NAKAMURA, M. SHIMAZAKI, Department of Mechanical Engineering, Tokyo City University, Tokyo, Japan

Session CH-4

Advances in the characterization of the porous structure

CH-4:IL01 **Integrating the Design of Complex Porous Ceramic Architectures with their Manufacturing by Additive Techniques**
A. ORTONA, MEMTi, SUPSI-DTI, Manno, Switzerland

CH-4:IL02 **Shrinkage and Distribution of Water during Drying of Ceramic Green Bodies**
B. NAIT-ALI, S. OUMMADI, N. LAURO, A. ALZINA, D.S. SMITH, University of Limoges, IRCER, UMR CNRS 7315, Limoges, France

Session CH-5

Modeling and simulation of porous structure and properties

CH-5:IL01 **On the Size-strength Relations of Highly Porous Brittle Materials**
K.G. NICKEL, C. LAUER, S. MÜCK, G. BUCK, University of Tübingen, Dept. of Geosciences, Division of Applied Mineralogy, Tübingen, Germany

CH-5:IL02 **Mass and Heat Transport in Monolithic Ceramic Catalysts during Gas Phase Reactions for Chemical Energy Storage**
J. THÖMING, K. KUHLMANN, M. SADEGHI, C. SINN, G. PESCH, University of Bremen, Chemical Process Engineering, Bremen, Germany

CH-5:IL03 **Effective Properties of Porous Ceramics – From Partial Sintering to TPMS Metamaterials**
W. PABST, E. GREGOROVÁ, T. UHLÍROVÁ, S. HRÍBALOVÁ, P. ŠIMONOVÁ, University of Chemistry and Technology, Prague, Prague, Czech Republic

CH-5:L04 **Atomistic Simulations of Mechanical Properties of Hybrid Core-shell Ceramic Nanoparticles**
K. KAYANG, **A.N. VOLKOV**, Department of Mechanical Engineering, University of Alabama, Tuscaloosa, AL, USA

Session CH-6

Applications of porous ceramics

CH-6:IL01 **Fabrication and Applications of Porous Geopolymers**
CHENGYING BAI[1], YINGJIE QIAO[1], XINYU LI[1], PAOLO COLOMBO[2, 3], [1]Key Laboratory of Superlight Materials and Surface Technology, Ministry of Education, College of Materials Science and Chemical Engineering, Harbin Engineering University, Harbin, China; [2]Department of Industrial Engineering, University of Padova, Padova, Italy; [3]Department of Materials Science and Engineering, The Pennsylvania State University, University Park, PA, USA

CH-6:IL02 **Porous Ceramics - From Processing to Novel Applications**
T. FEY, FAU, Institute of Glass and Ceramics, Erlangen, Germany

CH-6:IL03 **Nanoporous Ceramics for Efficient Thermal Insulation of Houses and Buildings**
N. ISU, LIXIL Corp., Koutou, Tokyo, Japan

SYMPOSIUM CI

PROGRESS IN ELECTROCERAMICS RESEARCH

Session CI-1

Dielectrics and microwave materials

CI-1:IL01 **Two Approaches to Develop Ultra-low Permittivity Ceramics for High Frequency Applications**
M. NELO, **H. JANTUNEN**, Microelectronics Research Unit, Faculty of Information Technology and Electrical Engineering, University of Oulu, Oulu, Finland

CI-1:IL02 **Glasses and Glass Ceramics: Properties and Applications in Microwave Electronics**
M. LETZ, SCHOTT AG, Mainz, Germany

CI-1:IL03 **Novel Dielectric Materials for Passive Integration and IoT Applications**
HONG WANG, Department of Materials Science and Engineering, Southern University of Science and Technology, Shen Zhen, China

CI-1:IL04 **Anomalous Domain Wall Motion in Cu-Cl Boracite: Implication for Negative Capacitance**
C. COCHARD[1, 2], J.G.M. GUY[1], R.W. WHATMORE[3], M. CONROY[4], K. MOORE[4], A. HARVEY[4], U. BANGERT[4], A. KUMAR[1], Ra.G.P. McQUAID[1], J.M. GREGG[1], [1]Centre for Nanostructured Media, School of Mathematics and Physics, Queen's University Belfast, Belfast, UK; [2]School of Science and Engineering, University of Dundee, Dundee, UK; [3]Department of Materials, Imperial College London, London, UK; [4]Department of Physics, School of Sciences and Bernal Institute, University of Limerick, Limerick, Ireland

CI-1:IL05 **Dielectric Materials in Ruddlesden-Popper Family for Millimeter Wave Applications**
XIANG MING CHEN, School of Materials Science and Engineering, Zhejiang University, Hangzhou, China

CI-1:L06 **Unexpected Electrical Breakdown Processes in Metal-Aluminumoxide-Metal Structures**
H. KLIEM, K. FALIYA, Institute of Electrical Engineering Physics, Saarland University, Saarbruecken, Germany

CI-1:L07 **PVA and hBN Incorporated Glass-ceramics with Improved Thermal Conductivity and Sinterability**
U. AKKASOGLU, Akcoat R&D Center, Ceramic Coatings Division, Sakarya, Turkey; D. ARIBUGA, O. BALCI, Koc University Boron and Advanced Materials Application and Research Center, İstanbul, Turkey; B. CICEK, Yıldız Technical University, Dept. of Metallurgical and Materials Engineering, Istanbul, Turkey

CI-1:IL08 **The Tuning of the Ferromagetic Resonance of SrZ Hexaferrite with an External Magnetic Field**
F.E. CARVALHO[1], A.C.C. MIGLIANO[1], M.R. SILVA[2], J.C.S. AMARAL[3], **R.C. PULLAR**[3, 4], [1]Instituto de Estudos Avançados / Instituto Tecnológico da Aeronáutica, Brazil; [2]Universidade Federal de Itajubá, Brazil; [3]Dept. Eng. de Materiais e Cerâmica & Dept. Física, Universidade de Aveiro, Portugal; [4]Dipartimento di Scienze Molecolari e Nanosistemi (DSMN), Università Ca' Foscari Venezia, Venezia Mestre, Venezia, Italy

CI-1:IL09 **Optimization of the Composition in a Composite Material for Microelectronics Packaging using the Ising Model**
YOSHIHIKO IMANAKA, Fujitsu laboratories Ltd., Atsugi, Kanagawa, Japan

CI-1:L10 **Magnetodielectric and Electromagnetic Wave Absorption Properties of Ceramic Nanocomposites based on the Magnetically Soft, Semi-hard and Hard Ferrites**
A. RADON, P. WLODARCZYK, L. HAWELEK, M. POLAK, A. KOLANO-BURIAN, Łukasiewicz Research Network, Institute of Non-Ferrous Metals, Gliwice, Poland

CI-1:L11 **Microwave Dielectric Ceramics with Enhanced Configuration Entropy in the Quinary System (Ba-Sr-Ca-Mg)TiO3**
C. PITHAN[1], Y.C. LEE[2], P.-Y. LEE[3], H.-Y. LEE[4], Y. WOLFF[1], J. FRIEDRICH[1], R. WASER[1], [1]Peter Grünberg Institut, Forschungszentrum Jülich, Germany; [2]National Pingtung University of Science and Technology, Taiwan; [3]National Cheng Kung University, Tainan, Taiwan; [4]École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

CI-1:L12 **Pressure-assisted Sintering of CaCu3Ti4O12 Dielectrics with Particular Response to Light Irradiation**
P. CTIBOR[1, 2], J. SEDLÁČEK[1], F. LUKÁČ[2], [1]Dept. of Electrotechnology, FEE Czech Technical University, Prague, Czech Republic; [2]Materials Engineering Department, Institute of Plasma Physics of the CAS, Prague, Czech Republic

Session CI-2

Ferroelectric, piezoelectric, pyroelectric, and ferroelastic ceramics

CI-2:IL01 **Ferroelastic Properties of Lead-free Piezoelectric Ceramics**
A. MARTIN, N.H. KHANSUR, **K.G. WEBBER**, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany

CI-2:IL02 **Pressure Assisted Stabilization of Novel Pb-free Ferroic Oxides**
M. SUCHOMEL, CNRS - ICMCB, Pessac, France

CI-2:IL03 **Solvothermal Synthesis of Barium Titanate Nanocubes and their Assembly**
S. UENO, S. HATAKEYAMA, M. WATANABE, K. FUKASAWA, T. CHIKATA, I. FUJII, **SATOSHI WADA**, Material Science and Technology, Graduate Faculty of Interdisciplinary Research, University of Yamanashi, Kofu, Japan

CI-2:IL04 **Strain Effect on Relaxor Ferroelectric Domains in Epitaxial 0.67Pb(Mg1/3Nb2/3)O3-0.33PbTiO3/SrRuO3 Heterostructures**
M. SPREITZER[1], J. BELHADI[1], U. GABOR[1], H. URŠIČ[2], N. DANEU[1], G. KOSTER[1,3], [1]Advanced Materials Department, Jožef Stefan Institute, Ljubljana, Slovenia; [2]Electronic Ceramics Department, Jožef Stefan Institute, Ljubljana, Slovenia; [3]MESA+ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands

CI-2:IL05 **Neutron Diffraction Studies of Phase Transitions in Improper and Incommensurate Ferroelectrics**
F.D. MORRISON, EaStCHEM School of Chemistry, University of St Andrews, St Andrews, UK

CI-2:IL06 **Understanding and Development of Ferroelectrics in Nanoscale**
YUKIO SATO, Kyushu University, Fukuoka, Japan

CI-2:IL07 **Strategies for Enhancement of Energy Storage in Pb-free Ferroic Ceramics**
ZHILUN LU[1], GE WANG[1], DAWEI WANG[1], **A. FETEIRA**[2], I.M. REANEY[1], [1]Department of Materials Science and Engineering, University of Sheffield, Sheffield, UK; [2]Materials and Engineering Research Institute, Sheffield Hallam University, Sheffield, UK

CI-2:IL08 **Recent Progress in Structural Studies of Ferroelectrics at Synchrotron Radiation Facility SPring-8**
YOSHIHIRO KUROIWA, Graduate School of Advanced Science and Engineering, Hiroshima University, Higashihiroshima, Hiroshima, Japan

CI-2:IL09 **Influence of Graded Doping on the Long-term Reliability of Nb-doped Lead Zirconate Titanate (PZT) Films**
WANLIN ZHU, B. AKKOPRU-AKGUN, J.I. YANG, K. WANG, S. TROLIER-MCKINSTRY, Department of Materials Science and Engineering and Materials Research Institute, The Pennsylvania State University, University Park, PA, USA; C. FRAGKIADAKIS, S.W. KO, P. MARDILOVICH, XAAR plc, Cambridge, UK

CI-2:IL10 **Local Structural Features and their Dynamics in Lead-Free Ferroelectrics at Atomic Scale**
A. BENCAN[1,4], O. CONDURACHE[1,4], H. URSIC[1,4], T. ROJAC[1,4], M. KOMELJ[3], B. DKHIL[5], A BRADESKO[5], D. DAMJANOVIC[6], G. DRAZIC[2], [1]Electronic Ceramics Department, Jozef Stefan Institute, Ljubljana, Slovenia; [2]Department of Materials Chemistry, National Institute of Chemistry, Ljubljana, Slovenia; [3]Department for Nanostructured Materials, Jozef Stefan Institute, Ljubljana, Slovenia; [4]Jozef Stefan International Postgraduate School, Ljubljana, Slovenia; [5]Laboratoire Structures, Propriétés et Modélisation des Solides, CentraleSupélec, Université Paris-Saclay, Gif-sur-Yvette, France; [6]Group for Ferroelectrics and Functional Oxides, Institute of Materials, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

CI-2:IL11 **Lead-free Antiferroelectric Niobate-based Ceramics**
JING-FENG LI, School of Materials Science and Engineering, Tsinghua University, Beijing, China

CI-2:L12 **Porous PZT Ceramic Films and Composites for Application in Electronics**
K.A. VOROTILOV, M.R. BAKLANOV, A.S. SIGOV, MIREA - Russian Technological University, Moscow, Russia

CI-2:L13 **Electrocaloric Effect of KTa0.65Nb0.35O3 / BaTiO3 Multilayer Thin Films prepared by sol-gel Method**
BYEONG-JUN PARK, Dept. of Materials Engineering and Convergence Technology, RIGET, Gyeongsang National University, Jinju, South Korea

CI-2:IL14 **Flexoelectrically Driven out-of-plane Piezoelectricity in 2D Materials**
YUNSEOK KIM, School of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon, South Korea

CI-2:IL15 **Direct Measurements of Electrocaloric Effect by Scanning Thermal Microscopy**
YUNYA LIU, School of Materials Science and Engineering, Xiangtan University, Xiangtan, Hunan, China

CI-2:IL16 **The impact of Local Structural Heterogeneity on Electrical Properties of Ferroelectrics**
SHUJUN ZHANG[1], FEI LI[2], LONG-QING CHEN[3], T.R. SHROUT[3], [1]ISEM, AIIM, University of Wollongong, NSW, Australia; [2]EMRL, Xi'an Jiaotong University, Xi'an, China; [3]MRI, Pennsylvania State University, University Park, PA, USA

CI-2:IL17 **Sintering Strategies towards Piezoceramics and MEMS with Controlled Chemistry and Interfaces**
C. ELISSALDE, U.C. CHUNG, I.M. RUA TABORDA, M. MAGLIONE, CNRS, Université de Bordeaux, ICMCB, Pessac, France; H. DEBÉDA, A. DIOP, B. PLANO, Université de Bordeaux, Laboratoire IMS, Talence, France

CI-2:IL18 **Increase of Piezoelectric Properties in AlN and GaN by Doping**
M. UEHARA, S.A. ANGGRAINI, K. HIRATA, H. YAMADA, M. AKIYAMA, AIST, Tosu, Saga, Japan

CI-2:IL19 **Large Piezoelectricity in Ternary Lead-free Single Crystals**
YAOJIN WANG, Nanjing University of Science and Technology, Nanjing, China

CI-2:IL20 **Ultrahigh Strain and Piezoelectric Behavior in Gen III PMN-PZT Single Crystals (d33>5,000 pC/N) Developed by SSCG Technique**
HYUN-TAEK OH[1], MOON-CHAN KIM[1], **HO-YONG LEE**[1,2], [1]Ceracomp Co., Ltd., Cheonan, South Korea, [2]Sunmoon University, Asan, South Korea

CI-2:L21 **Effect of Interface Phenomena on Leakage and Relaxation of Ceramic Ferroelectric Capacitors**
A.S. SIGOV, YU.V. PODGORNY, K.A. VOROTILOV, MIREA - Russian Technological University (RTU MIREA), Moscow, Russia

CI-2:L22 **Dynamics of Ferroelectric Domain Walls in Bismuth Ferrite Observed by In-situ Voltage Biasing Transmission Electron Microscopy**
O. CONDURACHE[1,2], G. DRAŽIĆ[1,2,3], T. ROJAC[1,2], H. URŠIČ[1,2], B. DKHIL[4], A. BRADEŠKO[4], A. BENČAN[1,2], [1]Electronic Ceramics Department, Jožef Stefan Institute, Ljubljana, Slovenia; [2]Jožef Stefan International Postgraduate School, Ljubljana, Slovenia; [3]Department of Materials Chemistry, National Institute of Chemistry, Ljubljana, Slovenia; [4]Laboratoire Structures, Propriétés et Modélisation des Solides, CentraleSupélec, Université Paris-Saclay, Gif-sur-Yvette, France

Session CI-3
Multiferroics and magnetoelectric ceramics

CI-3:IL01 **Designing Multiferroic Perovskite Oxides with Phase-Change Magnetoelectric Responses**
H. AMORÍN, M. ALGUERÓ, J.A. QUINTANA-CILLERUELO, A. CASTRO, Instituto de Ciencia de Materiales de Madrid (ICMM), CSIC, Cantoblanco, Madrid, Spain; C.M. FERNÁNDEZ-POSADA, University of Cambridge, Downing Street, Cambridge, UK

CI-3:IL02 **Magnetization Reversal by Electric Field at Room Temperature in Co Substituted Bismuth Ferrite Thin Film**
MASAKI AZUMA, K. SHIGEMATSU, Laboratory for Materials and Structures, Tokyo Institute of Technology, Yokoyama, Japan and Kanagawa Institute of Industrial Science and Technology, Ebina, Japan; K. SHIMIZU, K. OZAWA, M. KATSUMATA, Laboratory for Materials and Structures, Tokyo Institute of Technology, Yokoyama, Japan; H. HOJO, Department of Energy and Material Science, Kyushu University, Fukuoka, Japan; K. MIBU, Nagoya Institute of Technology, Nagoya, Japan

CI-3:IL03 **Magnetoelectric Ceramic Layered Composites: Causes behind Variability beyond Interface Quality**
M. ALGUERO, H. AMORÍN, A. CASTRO, Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Cantoblanco, Madrid, Spain; P. RAMOS, Departamento de Electrónica, Universidad de Alcalá, Alcalá de Henares, Spain; R. MORENO, Instituto de Cerámica y Vidrio (ICV-CSIC), Cantoblanco, Madrid, Spain; M. VENET, Departamento de Física, Universidade Federal de São Carlos, São Carlos, SP, Brazil

CI-3:L04 **Magnetic Phase Transition and Critical Behavior of La0.7Ca0.3MnO3-doped Titanium Compounds**
YUS RAMA DENNY[1], D. GINTING[2, 4], D. NANTO[3], K. TARIGAN[4], D. SEBAYANG[4], S. HADI[5], M. IKSAN[6], T. FIRMANSYAH[7], PHAN THE LONG[8], [1]Department of Physics Education, University of Sultan Ageng Tirtayasa, Banten, Indonesia; [2]Department of Applied Physics and Institute of Natural Sciences, Kyung Hee University, Yong-in, South Korea; [3]Physics Education, Syarif Hidayatullah State Islamic University, Jakarta, Indonesia; [4]Department of Mechanical Engineering, Mercu Buana University, Jakarta, Indonesia; [5]Departement of Mechanical Engineering, State Polytechnic of Malang, East Java, Indonesia; [6]PSTBM-BATAN, Kawasan Puspitek Serpong, Tangerang Selatan, Banten, Indonesia; [7]Department of Electrical Engineering, University of Sultan Ageng Tirtayasa, Banten, Indonesia; [8]Department of Physics and Oxide Research Center, Hankuk University of Foreign StudiesYongin, South Korea

Session CI-4
Semiconducting and fast ion-conducting ceramics

CI-4:IL01 **Doping and Defects in Oxide Semiconductors**
A. JANOTTI, University of Delaware, Department of Materials Science and Engineering, Newark, DE, USA

CI-4:IL02 **Non-traditional Oxide Semiconductors for Photovoltaic Applications**
TAKAHISA OMATA, I. SUZUKI, IMRAM, Tohoku University, Sendai, Japan

CI-4:IL03 **Development of Lithium Conducting Oxides from Crystal Chemistry to Solid-state Batteries**
E.J. CUSSEN, Department of Materials Science and Engineering, The University of Sheffield, UK

CI-4:IL04 **Solid-phase Crystallization to Achieve Highly Transparent Conductive Polycrystalline N-Type Doped In2O3 Films trough the Evolution of Implicate Order from Amorphous to Polycrystalline States**
TETSUYA YAMAMOTO, Kochi University of Technology, Kochi, Japan

SYMPOSIUM CJ
MATERIALS DEMANDS TOWARDS NEXT GENERATION ELECTROCHEMICAL ENERGY STORAGE SYSTEMS

Session CJ-1
Batteries

CJ-1:IL01 **Ordering Phenomena in Na-layered Oxide Electrode Materials**
C. DELMAS[1], L. VITOUX[1], M. GUIGNARD[1], J. YOSHIDA[1, 2], M. AVDEE[3], N. SHARMA[4], M. SUCHOMEL[1], F. WEILL[1], [1]ICMCB-CNRS, Université de Bordeaux, Pessac, France; [2]TOYOTA MOTOR EUROPE NV/SA, Zaventem, Belgium; [3]Bragg Institute ANSTO, Kirrawee DC NSW, Australia; [4]School of Chemistry, UNSW Australia, Sydney, New South Wales, Australia

CJ-1:IL02 **Sustainability Implications of Emerging Batteries – Prospective LCA of Sodium and Magnesium Batteries**
M. WEIL, J. PETERS, C. TOMASINI MONTENEGRO, M. BAUMANN, KIT-HIU, KIT-ITAS, Karlsruhe, Germany

CJ-1:IL03 **Operando Interface Characterization of Battery Materials**
E.J. BERG, Department of Chemistry, Uppsala University, Sweden

CJ-1:IL04 **Advances in Lithium-sulfur Batteries**
A. MANTHIRAM, Materials Science and Engineering University of Texas at Austin, Austin, TX, USA

CJ-1:IL05 **On the Road to a Multi-coaxial-cable Battery: Development of a Novel 3D-printed Composite Solid Electrolyte**
D. GOLODNITSKY[1,2], H. RAGONES[1], A. VINEGRAD[1], G. ARDEL[1], E. MADOS[1], Y. KAMIR[1], M. GOOR[1], M.M. DORFMAN[1], A. GLADKIKH[2], [1]School of Chemistry, Tel Aviv University, Tel Aviv, Israel; [2]Wolfson Applied Materials Research Center, Tel Aviv, Israel

CJ-1:IL06 **Synthesis of Micron-sized Ni-Rich Li(Ni,Co,Mn)O2 and Assessment of Bimodal Distributed Li-ion Battery Cathodes**
NAE-LIH WU, CHIA-HSIN LIN, WEI-HSIANG CHEN, Department of Chemical Engineering, National Taiwan University, Taipei, Taiwan

CJ-1:IL07 **Physical and Structural Behaviors of Organic Solids during Cation and Anion Insertions in Aqueous Batteries**
N. GUILLOU[1], E. QUAREZ[2], S. PERTICARARI[2], F. ODOBEL[3], P. POIZOT[2], **J. GAUBICHER**[2], [1]Institut Lavoisier, UMR CNRS C 8637, Université de Versailles, Saint-Quentin-en-Yvelines, Versailles Cedex, France; [2]IMN, Institut des Matériaux Jean Rouxel, CNRS-Université de Nantes, Nantes Cedex, France; [3]CEISAM, Chimie et Interdisciplinarité, Synthèse, Analyse, Modélisation, Université de Nantes, Nantes Cedex, France

CJ-1:IL08 **New Hydrides and Halides as Solid Electrolytes for Metal Ion Batteries**
D.H. GREGORY, School of Chemistry, University of Glasgow, Glasgow, UK

CJ-1:IL09 **Research Progress on Anode-free Lithium Metal Batteries**
BING JOE HWANG, National Taiwan University of Science and Technology, Taipei, Taiwan

CJ-1:IL10 **Novel Phosphates and Fluoride-phosphates Electrode Materials for Me-ion Batteries**
E.V. ANTIPOV, Lomonosov Moscow State University, Moscow, Russia, Skolkovo Institute of Science and Technology (Skoltech), Moscow, Russia

CJ-1:IL11 **How do We Address Safety of Li-ion Battery and Na-ion Battery?**
P. BALAYA, Department of Mechanical Engineering, Faculty of Engineering, National University of Singapore, Singapore

CJ-1:L12 **Inherent Electrochemical Activity of TiO2 Enhancing the Performance of Cathodes of Lithium-Sulfur Batteries**
L. KAVAN, M. VINARCIKOVA, M. ZLAMALOVA, M. ZUKALOVA, J. Heyrovsky Institute of Physical Chemistry, Prague, Czech Republic

CJ-1:L13 **Formulating Stable Electrolytes for the Metal Anode in Alkali Metal-Oxygen Batteries**
A.R. NEALE, CHIH-HAN YEN, L.J. HARDWICK, Stephenson Institute for Renewable Energy, University of Liverpool, Liverpool, UK; R. SHARPE, STEPHEN R. YEANDEL, P. GODDARD, K.V. LUZYANIN, Department of Chemistry, Loughborough University, Loughborough, UK; E.A. PETRUCCO, J. MATTHEY, Blounts Court Road, Sonning Common, Reading, UK

CJ-1:IL14 **Insight into the Reactivity and Potential Profile across the Electrified Interface in All-Solid-State Batteries Enabled by Operando X-Ray Photoelectron/Absorption Spectroscopy**
X. WU, L. HÖLTSCHI, M. MIROLO, C.A.F. VAZ, C. BORCA, T. HUTHWELKER, P. NOVÁK, **M. EL KAZZI**, Paul Scherrer Institute, Villigen PSI, Switzerland

CJ-1:IL15 **Layered Oxide-based Electrodes for Na-ion Batteries**
E. REDONDO[1], M. ZARRABEITIA[2], I. RUIZ DE LARRAMENDI[1], D. SHANMUKARAJ[3], E. GOIKOLEA[1], **T. ROJO**[1], [1]Organic and Inorganic Chemistry Department, University of the Basque Country (UPV/EHU), Bilbao, Spain; [2]Helmholtz Institute Ulm (HIU), Ulm; Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany; [3]Centre for Cooperative Research on Alternative Energies (CIC energiGUNE), Basque Research and Technology Alliance (BRTA), Alava Technology Park, Vitoria-Gasteiz, Spain

CJ-1:IL16 **Molecular-level Understanding & Design of Positive Electrode Materials For Rechargeable Aluminum Batteries**
R.J. MESSINGER, The City College of New York, New York, NY, USA

CJ-1:IL17 **Importance of Interfaces in Enabling Fast Charging Solid State Batteries**
E. QUEREL, I. SEYMOUR, R. BRUGGE, A. CAVALLARO, N. NABI, F. PESCI, **A. AGUADERO**, Department of Materials, Imperial College London, London, UK

CJ-1:IL18 **Solid State Polymer Electrolytes for Lithium Metal Batteries**
HSISHENG TENG, M.N. PHAM, Chemical Engineering, National Cheng Kung University, Tainan, Taiwan

CJ-1:IL19 **Trilayer Hybrid Solid Electrolyte based on Electrospun Interconnected Al-LLZO Nanofibers for Solid-State Lithium-Metal Batteries**
T.H. MENGESHA[1, 2], **CHUN-CHEN YANG**[1, 2, 3], [1]Battery Research Center of Green Energy, Ming Chi University of Technology, New Taipei City, Taiwan, R.O.C.; [2]Department of Chemical Engineering, Ming Chi University of Technology, New Taipei City, Taiwan, R.O.C.; [3]Department of Chemical and Materials Engineering, and Green Technology Research Center, Chang Gung University, Taoyuan City, Taiwan, R.O.C.

CJ-1:L20 **Influence of Cathode Additives and Separator Modification on the Performance of Li-sulfur Battery**
M. ZUKALOVA, M. VINARCIKOVA, B. PITNA LASKOVA, L. KAVAN, J. Heyrovsky Institute of Physical Chemistry, CAS, Prague, Czech Republic

CJ-1:IL21 **Battery Desalination vs. Seawater Batteries: Research at the Water/Energy Nexus**
V. PRESSER, INM - Leibniz Institute for New Materials, Saarbrücken, Germany

CJ-1:IL22 **In Situ Exploration of In-pore Redox Processes for Beyond Intercalation-type Energy Storage**
C. PREHAL, S. FREUNBERGER, V. WOOD, Department of Information Technology and Electrical Engineering, ETH Zürich, Zürich, Switzerland; IST Austria (Institute of Science and Technology Austria), Klosterneuburg, Austria; Department of Information Technology and Electrical Engineering, ETH Zürich, Zürich, Switzerland

CJ-1:IL23 **Development of Solid Electrolytes with Li10GeP2S12-type Crystal Structures: Performance Enhancement and Mechanistic Understanding of All-Solid-State Batteries**
SATOSHI HORI, RYOJI KANNO, Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, Japan

CJ-1:IL24 **Aqueous Electrolytes for Aluminum Ion Batteries: Investigating Ion Transport and Association Effects by Multinuclear NMR**
A. ZHENG[1, 2], G. PASTEL[3], M. GARAGA[1], M. DING[3], M. SCHROEDER[3], K. XU[3], **S. GREENBAUM**[1, 2], [1]Department of Physics & Astronomy, Hunter College of the City University of New York, New York, NY, USA; [2]Graduate Center of the City University of New York, New York, NY, USA; [3]U.S. Army Research Laboratory, Adelphi, MD, USA

CJ-1:IL25 **Cross-talk Suppressing Multifunctional Electrolyte Additives for Enhanced Interfacial Stability of Ni-rich NCMs**
S. TRABESINGER, Battery Electrodes and Cells Laboratory of Electrochemistry, Paul Scherrer Institute, Villigen PSI, Switzerland

CJ-1:IL26 **Prospects for Industrial Scale Vanadium Redox Flow Batteries**
M. GUARNIERI, Department of Industrial Engineering, University of Padua, Interdepartmental Centre Giorgio Levi Cases for Energy Economics and Technology, University of Padua, Padova, Italy

CJ-1:L27 **Operando Optical Diagnostics of Battery Chemistries**
L.J. HARDWICK, Stephenson Institute for Renewable Energy, Department of Chemistry, University of Liverpool, UK

Session CJ-2
Supercapacitors

CJ-2:IL01 **Electrochemical Energy Storage Systems Based on Superconcentrated Electrolytes**
D. BÉLANGER, Département de Chimie, Université du Québec à Montréal, succursale Centre-Ville Montréal (Québec), Canada

CJ-2:IL02 **Bio-derived Carbons as Active Materials for Electrochemical Capacitors**
A. BALDUCCI, L.H. HESS, Friedrich-Schiller-University Jena, Jena, Germany; L. BORCHARDT, Ruhr-University Bochum, Bochum, Germany

CJ-2:IL03 **Kinetics of TiO2(B) Nanosheet Electrodes with Different Nanosheet Size and Orientation for High Rate Lithium Ion Capacitors and Batteries**
WATARU SUGIMOTO, I. NAGATANI, Y. TOMOHIRO, D. TAKIMOTO, D. MOCHIZUKI, S. HIDESHIMA, Shinshu University, Faculty of Textile Science and Technology, Ueda, Japan

CJ-2:IL04 **Insights into Pseudocapacitive Materials**
B. DUNN, Materials Science and Engineering Department, UCLA, Los Angeles, CA, USA

CJ-2:IL05 **Challenges and Prospects of Planar and 3D Micro-supercapacitors for Powering the Internet of Things**
K. ROBERT[1,2], B. ASBANI[1,2], B. BOUNOR[1,2,3], D. STIEVENARD[1,2], D. DERESMES[1,2], S. OUENDI[1,2], C. DOUARD[2,3], J. LE BIDEAU[2,3], P. ROUSSEL[4], T. BROUSSE[2,3], **C. LETHIEN**[1,2], [1]Institut d'Electronique, de Microélectronique et de Nanotechnologies (IEMN), Université de Lille, CNRS, Centrale Lille, ISEN, Université de Valenciennes, UMR 8520 - IEMN, Lille, France; [2]Réseau sur le Stockage Electrochimique de l'Energie (RS2E), CNRS FR 3459, Amiens Cedex, France; [3]Institut des Matériaux Jean Rouxel (IMN), CNRS UMR 6502 – Université de Nantes, Nantes cedex, France; [4]Unité de Catalyse et de Chimie du Solide (UCCS), Fédération Chevreul, Université de Lille, CNRS, Centrale Lille, ENSCL, Université d'Artois, UMR 8181 - UCCS, Lille, France

CJ-2:IL06 **Solution Processed Cu Oxide/Fe Oxide Electrode for Supercapacitor**
H.-E. LIN[1], M. UEMURA[1], Y. KATAYANAGI[2], Y. KUBOTA[1], **NOBUHIRO MATSUSHITA**[1], [1]Department of Materials Science and Engineering, Tokyo Institute of Technology, Tokyo, Japan; [2]Department of Technology Education, Faculty of Education, Gunma University, Gunma, Japan

SYMPOSIUM CK
SOLID OXIDE FUEL CELLS: MATERIALS AND TECHNOLOGY CHALLENGES

Session CK-1
High temperature solid oxide fuel cells

CK-1:IL01 **Solid Oxide Cells: Accelerated Measurements and Durability of Oxygen Electrodes**
XIAO-DONG ZHOU, Y. WANG, Y. SUN, A. TUCKER, E. DOGDIBEGOVIC, G. XIA, Department of Chemical Engineering, University of Louisiana at Lafayette, Lafayette, LA, USA

CK-1:IL02 **Practical Guidelines for Reliable Electrochemical Characterization of Solid Oxide Fuel Cells**
D. KLOTZ, Kyushu University, Fukuoka, Japan

CK-1:IL03 **Nanoscale Investigation of Long-term Operated Solid Oxideelectrolysis Cells**
J. VILLANOVA, ESRF The European Synchrotron, Grenoble Cedex, France; S. SCHLABACH, Institute for Applied Materials and Karlsruhe Nano Micro Facility, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany; A. BRISSE, **A. LEON**, European Institute for Energy Research, Karlsruhe, Germany

CK-1:IL04 **Advanced Microscopy and Spectroscopy Characterization Techniques of Electroceramics for SOFC Applications**
P.A. CROZIER, School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, AZ, USA

CK-1:IL05 **Hydride Superionic Conduction in Ba1.75LiH2.7O0.9**
GENKI KOBAYASHI, Institute for Molecular Science, National Institutes of Natural Sciences, Okazaki, Japan

CK-1:L06 **Modulating the Composition of Bimetallic Fe-Ni Exsolved Nanoparticles**
A. TSIOTSIAS[1,2], B. EHRHARDT[1], B. RUDOLPH[1], L. NODARI[3], SEUNGHYUN KIM[4], WOOCHUL JUNG[4], N. CHARISIOU[2], M. GOULA[2], **S. MASCOTTO**[1], [1]Institut für Anorganische und Angewandte Chemie, Universität Hamburg, Hamburg, Germany; [2]Department of Chemical Engineering, University of Western Macedonia, Koila, Kozani, Greece; [3]Department of Chemical Science, University of Padua, Padova, Italy; [4]Department of Materials Science and Engineering, KAIST, Daejeon, South Korea

CK-1:L07 **High Temperature Mechanical Properties of Zirconia Thin Ceramic Foils for SOFCs**
I. BOMBARDA, F. DÖMLING, T. LIENSDORF, C. SITZMANN, N. LANGHOF, S. SCHAFFÖNER, Universität Bayreuth, Bayreuth, Germany

Session CK-2
Intermediate temperature solid oxide fuel cells

CK-2:IL01 **Innovative Architectured Oxygen Electrodes for IT-SOFC using Electrostatic Spray Deposition**
E. DJURADO, N.I. KHAMIDY, R.K. SHARMA, Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, Grenoble, France

CK-2:IL02 **Perovskite Oxide Exsolution Anodes for Solid Oxide Fuel Cells**
S.A. BARNETT, T. ZHU, S. ZHANG, Northwestern University, Evanston, IL, USA

CK-2:IL03 **Cathode Nanoparticles for Boosting the Solid Oxide Fuel Cell Performance of Chemically Stable Proton Conducting Electrolytes**
E. TRAVERSA, School of Materials and Energy, University of Electronic Science and Technology of China, Chengdu, Sichuan, China

CK-2:IL04 **Partial Conductivities in Proton-conducting Oxide Systems**
G.C. MATHER, D. PÉREZ COLL, G. HERAS-JUARISTI, Á. TRIVIÑO-PELÁEZ, Instituto de Cerámica y Vidrio, CSIC, Campus de Cantoblanco, Madrid, Spain

CK-2:IL05 **Proton Conducting Solid Oxide Cells**
M.E. IVANOVA[1], W. DEIBERT[1], C. LENSER[1], O. GUILLON[1,2], N.H. MENZLER[1], [1]Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research (IEK-1), Jülich, Germany; [2]JARA Jülich-Aachen Research Alliance – Energy, Germany

CK-2:IL07 **Advancements in Lower-temperature Higher-power SOFCs**
E.D. WACHSMAN, Maryland Energy Innovation Institute, University of Maryland, College Park, MD, USA

CK-2:IL08 **Electrocatalysis at Nano-scaled Electrodes in Solid Oxide Fuel Cells**
D.B. DRASBÆK, M.L. TRAULSEN, B.R, SUDIREDDY, **P. HOLTAPPELS**, Technical University of Denmark, Kgs. Lyngby, Denmark

CK-2:L09 **Novel In Situ Isotope Exchange Raman Spectroscopy for Improved Understanding of Physiochemical Processes**
A. STANGL[1], D. PLA[1], C. PIROVANO[2], O. CHAIX[1], S. AMBROSIO[1], F. BAIUTTI[3], F. CHIABRERA[3], M. MERMOUX[4], A. TARANCÓN[3], C. JIMENEZ[1], M. BURRIEL[1], [1]Univ. Grenoble Alpes, CNRS, Grenoble-INP, LMGP, Grenoble France; [2]Univ. Lille, CNRS, Centrale Lille, ENSCL, Lille, France; [3]Catalonia Institute for Energy Research (IREC), Barcelona, Spain; [4]Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, Grenoble, France

CK-2:IL10 **Effect of Pressure on the Ageing Process of Metallic Interconnects in SOFC Stacks**
P. PICCARDO, D. PARAVIDINO, R. SPOTORNO, Department of Chemistry and Industrial Chemistry, University of Genova, Italy

CK-2:L11 **Nano-columnar La2NiO4+δ Films with Multifold Active Surface Area for Enhanced Electrode Performance**
A. RIAZ, A. STANGL, L. RAPENNE, C. JIMÉNEZ, M. BURRIEL, Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; M. MERMOUX, Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, Grenoble, France

CK-2:L12 **Structural and Transport Properties of Niobate Ceramics and Composites**
Y. BESPALKO[1], S. KHARINA[1,2], N. EREMEEV[1,2], V. SADYKOV[1,2], [1]Boreskov Institute of Catalysis, Novosibirsk, Russia; [2]Novosibirsk State University, Russia

Session CK-3

New frontiers in solid oxide fuel cell

CK-3:IL01 **Highly Performing and Stable Proton-conducting Steam Solid Oxide Electrolysis Cell with Triple-conductive Ruddlesden-Popper Phase Anode**
WENYUAN LI, **XINGBO LIU**, West Virginia University, Mechanical & Aerospace Engineering Department, Morgantown, WV, USA

CK-3:IL02 **Ex-situ Artificial Aging – An Effective Tool for Solid Oxide Cells Accelerated Stress Tests**
D. VLADIKOVA, B. BURDIN, A. SHEIKH, M. KRAPCHANSKA, IEES-BAS, Sofia, Bulgaria; P. PICCARDO, University of Genoa, Genoa, Italy; D. MONTINARO, SOLIDpower S.p.A, Mezzolombardo, Italy

CK-3:IL03 **New Glass Electrolyte for Intermediate Temperature Operation Fuel Cells**
T. ISHIYAMA, T. YAMAGUCHI, H. KISHIMOTO, K. DEVELOS-BAGARINAO, K. YAMAJI, AIST, Tsukuba, Japan; J. NISHII, Hokkaido Uni., Sapporo, Japan; T. YAMASHITA, H. KAWAZOE, Kawazoe Frontier Technology, Yokohama, Japan; T. OMATA, Tohoku University, Sendai, Japan

CK-3:IL04 **Advanced Reversible Solid Oxide Cell**
G. RAIKOVA, E. MLADENOVA, B. BURDIN, D. VLADIKOVA, Z. STOYNOV, Acad. E. Budevski Institute of Electrochemistry and Energy Sytems, Bulgarian Academy of Sciences, Sofia, Bulgaria

CK-3:L05 **A Simple Approach to make the Commercial Solid Oxide Fuel Cells Flexible in the Use of Fuels**
S. CAMPAGNA ZIGNANI, M. LO FARO, A.S. ARICÒ, Institute of Advanced Energy Technologies (ITAE) of the Italian National Research Council (CNR), Messina, Italy

Session CK-4

SOFC cells, stack design and system demonstration and application

CK-4:IL01 **Assessment of Sintering Admixtures for SOFC Electrolytes**
F.M.B. MARQUES, Dept. of Materials and Ceramic Eng., CICECO, University of Aveiro, Aveiro, Portugal

CK-4:IL02 **Preparation and Characterization of Mono- and Bi-layer Proton Ceramic Fuel Cells (PCFCs)**
Y. MATSUZAKI, Tokyo Gas Co., Ltd., Yokohama, Kanagawa, Japan

CK-4:IL03 **Freeze Tape-casted and In Situ-decorated Solid Oxide Cells for Reversible Applications**
P. CARPANESE[1], D. CADEMARTORI[1], D. CLEMATIS[1], A.M. ASENSIO[1], S. PRESTO[2], M. VIVIANI[2], A. BARBUCCI[1, 2], [1]Department of Civil, Chemical and Environmental Engineering (DICCA), University of Genova, Genova, Italy; [2]Institute of Condensed Matter Chemistry and Technology for Energy (ICMATE), National Research Council (CNR), c/o DICCA-UNIGE, Genova, Italy

CK-4:IL04 **Achievement of Degradation Analyses for High-efficient SOFC Stacks**
TERUHISA HORITA, Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

CK-4:IL05 **Proton Ceramic Electrolysers: From Materials to Stack for Pressurized Hydrogen Production**
M.-L. FONTAINE[1], E. VØLLESTAD[1], M. BUDD[2], J.M. SERRA[3], T. NORBY[4], C. ATLI CÓRDOVA GEIRDAL[5], E. DEL POZO POLIDORO[6], A. NIJMEIJER[7], P. VEENSTRA[7], [1]SINTEF Industry, Norway; [2]CoorsTek Membrane Sciences AS, Norway; [3]Instituto Technologica Quimica, Spain; [4]Department of Chemistry, University of Oslo, Norway; [5]Carbon Recycling International, Iceland; [6]MC2 Ingenieria y Sistemas SL, Spain; [7]Shell Global Solutions International B.V., Netherlands

CK-4:IL06 **SOFC Development in Jülich / Utilization of Bio-Syngas in Solid Oxide Fuel Cell Stacks**
C. LENSER[1], H. JEONG[1,3], M. HAUSER[2], S. FENDT[2], F. FISCHER[2], M. HAUCK[2], S. HERRMANN[2], H. SPLIETHOFF[2], O. GUILLON[4], N.H. MENZLER[1], [1]Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research - Materials Synthesis and Processing (IEK-1), Jülich, Germany; [2]Technische Universität München, Chair of Energy Systems, Garching, Germany; [3]Korea Institute of Ceramic Engineering and Technology (KICET), Engineering Ceramic Center, Seoul, South Korea; [4]Jülich Aachen Research Alliance: JARA-Energy, Jülich, Germany

Session CK-5

Modelling of SOFC materials, processes and devices

CK-5:IL01 **Multiscale Modelling of Reversible Solid Oxide Cells**
B. BOSIO, F.R. BIANCHI, DICCA, University of Genoa, Genoa, Italy

CK-5:IL02 **Characterisation of Materials for Solid Oxide Cells by Means of Model-type Thin Film Samples**
A.K. OPITZ, TU Wien, Institute of Chemical Technologies and Analytics, Vienna, Austria

CK-5:IL03 **Modelling and Characterization of Solid Oxide Cells: Impact of Microstructure and Reaction Mechanisms on Cell Performances and Degradation**
M. HUBERT, A. ABAZA, L. RORATO, G. SASSONE, L. YEFSAH, J. LAURENCIN, Univ. Grenoble Alpes – CEA/LITEN/DTCH, Grenoble, France

CK-5:IL04 **Model Experiments for Bridging the Gap between Fundamentals and Applied SOFC Research**
A. NENNING[1], A.K. OPITZ[1], C. BISCHOF[2], M. HOLZMANN[1], M. GERSTL[1], M. DOPPLER[1], M. BRAM[2], [1]Technical University Vienna, Institute of Chemical Technologies and Analytics, Vienna, Austria; [2]Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Materials Synthesis and Processing (IEK-1), Jülich, Germany

CK-5:IL05 **Computational Modeling and Simulation of Ion Transport in Oxide Electrolytes for Energy Conversion**
M. MARTIN, RWTH Aachen University, Aachen, Germany

CK-5:IL06 **Multi-scale Modelling on High-temperature Solid Oxide Cells**
YUQING WANG, Beijing Institute of Technology, Beijing, China; L. WEHRLE, Karlsruhe Institute of Technology, Germany; A. BANERJEE, University of Twente, Netherlands; YIXIANG SHI, Tsinghua University, China; O. DEUTSCHMANN, Karlsruhe Institute of Technology, Germany

SYMPOSIUM CL

INORGANIC MATERIALS SYSTEMS FOR ADVANCED PHOTONICS

Session CL-1

Photonic nanomaterials and nanostructures

CL-1:IL01 **Research and Perspectives of Transparent Optical Ceramics**
YIQUAN WU, K. INAMORI, School of Engineering, New York State College of Ceramics at Alfred University, Alfred, NY, USA

CL-1:IL02 **Light-driven Multiple Charge Transfers in Metal Oxide Nanocrystals**
I. KRIEGEL, Functional Nanosystems, Italian Institute of Technology, Genova, Italy

CL-1:IL03 **Enhanced Nonlinear Diffraction Processes in Hybrid Plasmonic-ferroelectric Superlattices**
A. GÓMEZ-TORNERO, P. PALACIOS, P. MOLINA, S. CARRETERO-PALACIOS, L.E. BAUSÁ, **M.O. RAMIREZ**, Departamento de Física de Materiales, Universidad Autónoma de Madrid, Madrid, Spain

CL-1:IL04 **Nonlinear Optics in Whispering Gallery Mode Microresonators**
D. FARNESI[1], X. ROSELLO-MECHO[2], M. DELGADO-PINAR[2], M.V. ANDRÉS[2], G. RIGHINI[1], G. NUNZI CONTI[1], **S. SORIA**[1], [1]IFAC-CNR, Institute of Applied Physics "N. Carrara", Sesto Fiorentino (FI), Italy; [2]Dep. of Applied Physics and Electromagnetism-ICMUV, University of Valencia, Burjassot, Spain

CL-1:L05 **Quantum Dot Structures in Glass Matrices for Solar Photo-thermal Water Heating**
M. AL-MURISH[1], E. BARIMAH[1], V. AUTADE[2], R.P. PANMAND[2], B.B. KALE[2], A. SCOTT[1], B. COAPES[3], A. JHA[1], [1]School of Chemical and Process Engineering, University of Leeds, Leeds, UK; [2]Center for Materials for Electronics Technology (C-MET), Ministry of Electronics and Information Technology (MeitY), Panchawati, Pune, India; [3]Venator Innovation Centre, Wynyard, Stockton-on-Tees, UK

CL-1:L06 **Quantum dots Coupled Systems for Efficient Energy and Charge Transfer Processes**
C.N. DIBENEDETTO, E. FANIZZA, M.L. CURRI, Department of Chemistry, University of Bari, Italy; A. PANNIELLO, C. INGROSSO, **M. STRICCOLI**, CNR-IPCF Bari, Italy

CL-1:L07 **Luminescent Si Nanoparticles Assembled in Novel and Facile Mechanochemical Process of (HSiO1.5)n Polymers**
YUPING XU[1], YUNZI XIN[2], TAKASHI SHIRAI[1, 2], [1]Department of Life Science and Applied Chemistry, Graduate School of Engineering, Nagoya Institute of Technology, Nagoya, Aichi, Japan; [2]Advanced Ceramics Research Center, Nagoya Institute of Technology, Nagoya, Aichi, Japan

Session CL-2
Luminescent and chromogenic ceramics and glass systems

CL-2:IL01 **Transparent Luminescent YSZ+RE, MgAl2O4+RE Ceramics Shaped by Ultrasonic Compaction of Nanopowders, Sintered using SPS**
O. KHASANOV, E. DVILIS, D. VALIEV, S. STEPANOV, V. PAYGIN, Tomsk Polytechnic University, Tomsk, Russia

CL-2:IL02 **Graphene-based Structures and Composites for Biophotonics**
A. LUKOWIAK, Y. GERASYMCHUK, K. HALUBEK-GLUCHOWSKA, M. FANDZLOCH, D. SZYMANSKI, P. GLUCHOWSKI, Institute of Low Temperature and Structure Research, PAS, Wroclaw, Poland; L.T.N. TRAN, M. FERRARI, IFN-CNR CSMFO Lab. and FBK Photonics Unit, Trento, Italy

CL-2:IL03 **Nanocrystalline LDHs Phosphors**
R. SKAUDZIUS[1], A. LUKOWIAK[2], P. GŁUCHOWSKI[2,3], W. STREK[2], **A. KAREIVA**[1], [1]Institute of Chemistry, Vilnius University, Vilnius, Lithuania; [2]Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Wroclaw, Poland; [3]Nanoceramics Spolka Akcyjna, Wroclaw, Poland

CL-2:IL04 **Parasitic Optical-absorption Signals present in Transparent Ceramics: Identification of Sources and Formation Mechanisms**
A.E. GOLDSTEIN, Israel Ceramics Institute, Technion City, Haifa, Israel

CL-2:IL05 **Impact of the Sintering Pressure on the Thermoluminescence Properties of Persistent Luminescent Ceramics**
P. GŁUCHOWSKI[1,2], R. TOMALA[1], S. VELTRI[1], K. RAJFUR[3], D. KUJAWA[1], V. BOIKO[1], W. STREK[1], [1]Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Wroclaw, Poland; [2]Nanoceramics Inc., Wroclaw, Poland; [3]Wroclaw University of Science and Technology, Wroclaw, Poland

CL-2:IL06 **Activator-doped Amorphous Materials for Luminescent Application**
HIROKAZU MASAI, National Institute of Advanced Industrial Science and Technology (AIST), Ikeda, Osaka, Japan

CL-2:L07 **Enhancing Photoluminescence of Ceramic Phosphors Fabricated by Spark Plasma Sintering**
B. RATZKER[1], A. WAGNER[2], S. KALABUKHOV[2], M. SOKOL[1], N. FRAGE[2], [1]Department of Materials Science and Engineering, Tel Aviv University, Tel Aviv, Israel; [2]Department of Materials Engineering, Ben-Gurion University of the Negev, Beer-Sheva, Israel

CL-2:L08 **Fabrication and Characterization of New Phosphate based Glass-ceramics Suitable for drawing (bio)photonic Fibers**
N. OJHA[1], D. PUGLIESE[2], J. MASSERA[3], N.G. BOETTI[4], C. BOUSSARD-PLÉDEL[5], **L. PETIT**[2], [1]Photonics Laboratory, Tampere University, Tampere, Finland; [2]Politecnico di Torino, Dipartimento di Scienza Applicata e Tecnologia, Torino, Italy; [3]Faculty of Biomedical Science and Engineering and BioMediTech Institute, Tampere University of Technology, Tampere, Finland; [4]Fondazione LINKS - Leading Innovation & Knowledge for Society, Torino, Italy; [5]University of Rennes, Ecole Nationale Supérieure de Chimie de Rennes, CNRS, ISCR-UMR 6226, Rennes, France; [6]IFN - CNR, CSMFO Laboratory, Povo, Italy

Session CL-3
Laser materials

CL-3:IL01 **Breaking through the Wavelength Barrier: State-of-play on Rare-earth Mid-infrared Fiber Lasers at 4-9 Microns**
A.B. SEDDON, D. FURNISS, Z. TANG, L. SOJKA*, J. NUNES, R. CRANE, E. BARNEY, M. FARRIES, T.M. BENSON, S. SUJECKI, Mid-Infrared Photonics Group, George Green Institute for Electromagnetics Research, Faculty of Engineering, University of Nottingham, Nottingham, UK; *Telecommunications & Teleinformatics Dept., Wroclaw University of Technology, Poland

CL-3:IL02 **Host Sensitization-dependence of Rare Earth Luminescence in SnO2-based Photonic Systems**
R. BALDA, Depto de Física Aplicada I, Escuela de Ingeniería de Bilbao, Universidad del País Vasco UPV-EHU, Bilbao, Spain & Materials Physics Center CSIC-UPV/EHU, San Sebastian, Spain; J. FERNÁNDEZ, Donostia International Physics Center DIPC, San Sebastian, Spain; C. CASCALES, Instituto de Ciencia de Materiales de Madrid ICMM, CSIC, Madrid, Spain; F. PRUDENZANO, Politecnico di Bari, Bari, Italy; A. LUKOWIAK, Institute of Low Temperature and Structure Research, PAS, Wroclaw, Poland; M. FERRARI, IFN-CNR CSMFO Lab. and FBK Photonics Unit, Povo, Trento, Italy & Museo Storico della Fisica e Centro Studi e Ricerche "Enrico Fermi", Roma, Italy; LAM THI NGOC TRAN, Dept. of Applied Sciences, Ho Chi Minh City University of Technology and Education, Ho Chi Minh City, Vietnam & IFN-CNR CSMFO Lab. and FBK Photonics Unit, Povo, Trento, Italy; L. ZUR, IFN-CNR CSMFO Lab. and FBK Photonics Unit, Povo, Trento, Italy

CL-3:IL03 **Advances in Alkaline Earth Fluoride Laser Ceramics**
M. MORTIER, P. GREDIN, Institut de Recherche de Chimie Paris, CNRS-Chimie ParisTech, PSL, Paris, France

CL-3:IL04 **Fabrication of Sesquioxide-based Laser Ceramics and Demonstration of their High Power High Efficiency Laser Operations**
J. WANG[1], D. YIN[1], M. NI[1], J. MA[2], D. SHEN[2], Z. DONG[3], **DINGYUAN TANG**[1], [1]School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore; [2]Jiangsu Key Laboratory of Advanced Laser Materials and Devices, Jiangsu Normal University, Xuzhou, China; [3]School of Materials Science and Engineering, Nanyang Technological University, Singapore

CL-3:IL05 **Mid-infrared Supercontinuum Generation from Low-phonon Energy Optical Fibers**
F. SMEKTALA, R. BIZOT, A. LEMIÈRE, A. MALDONADO, M. EVRARD, F. DÉSÉVÉDAVY, B. KIBLER, ICB Laboratoire Interdisciplinaire Carnot de Bourgogne, UMR 6303 CNRS-UBFC, Dijon, France

CL-3:L06 **Broadly Tunable Laser Emission from Tm:doped (Y,Sc)2O3 Ceramics**
A. PIRRI, Istituto di Fisica Applicata "Nello Carrara", CNR-IFAC, Sesto F.no, FI, Italy; R.N. MAKSIMOV, Institute of Electrophysics UrB RAS, and Ural Federal University Ekaterinburg, Russia; V.A. SHITOV, V.V. OSIPOV, Institute of Electrophysics UrB RAS, Ekaterinburg, Russia; E. SANI, B. PATRIZI, M. VANNINI, **G. TOCI**, Istituto Nazionale di Ottica, CNR-INO, Firenze (FI) Italy

Session CL-4
Inorganic optical fibers

CL-4:IL01 **The Interplay Between Radiation-induced Attenuation, Photodarkening and Photobleaching at Pump Wavelength in Er- and Yb-doped Silica Optical Fibers**
F. MADY, M. BENABDESSELAM, W. BLANC, Université Côte d'Azur, CNRS, INPHYNI UMR 7010, Nice, France

CL-4:IL02 **Composite Material Hollow Core Optical Fibres**
P.J.A. SAZIO, A. LEWIS, F. DE LUCIA, F. POLETTI, J.R. HAYES, C.C. HUANG, D. HEWAK, ORC, University of Southampton, UK; J.V. BADDING, Dept. of Chemistry and Materials Research Institute, Pennsylvania State University, State College, PA, USA; W. BELARDI, Université de Lille, CNRS, UMR 8523 - PhLAM - Physique des Lasers Atomes et Molécules, Lille, France

CL-4:IL03 **Chalcogenide Glasses for Advanced Photonics**
J.L. ADAM, Glasses & Ceramics Research Group, Institut des Sciences Chimiques de Rennes, UMR CNRS 6226, Université de Rennes 1, France

CL-4:IL04 **Novel Hollow Core Optical Fibers: From Design to Applications**
W. BELARDI[1], A. PASTRE[1], S. PLUS[1], K. BAUDELLE[1], G. BOUWMANS[1], L. BIGOT[1], P. JAWORSKI[2], G. DUDZIK[2], P. KOZIOL[2], P.J. SAZIO[3], K. KRZEMPEK[2], [1]Université de Lille, CNRS, UMR 8523 PhLAM, Villeneuve d'Ascq, France; [3]Wroclaw University of Science and Technology, Poland; [3]University of Southampton, UK

CL-4:IL05 **Synthesis and Characterization of Novel Magneto Optical Fibers**
M. NALIN, Chemistry Institute, São Paulo State University, Araraquara, SP, Brazil; D.F. FRANCO, Chemistry Institute, São Paulo State University, Araraquara, SP, Brazil

Session CL-5
Photons management

CL-5:IL01 **Integrated Photonics for Biomedical Spectroscopy**
J.S. WILKINSON, Optoelectronics Research Centre, University of Southampton, Southampton, UK

CL-5:IL02 **Manipulation of Light-matter Interaction on the Nanoscale**
A.L. BRADLEY, C. HRELESCU, School of Physics, Trinity College Dublin, College Green, Dublin, Ireland

CL-5:IL03 **Sensing Systems based on Optical Resonators**
T. IOPPOLO, College of Engineering and Computing Sciences, New York Institute of Technology, Old Westbury, NY, USA

CL-5:L04 **RF - Sputtering Fabrication of Flexible SiO2/HfO2 Glass-based 1D Photonic Crystals and Planar Waveguides**
A. CARLOTTO[1,2], S.M. PIETRALUNGA[2], L.T.N. TRAN[1,2,3], O. SAYGINER[4], E. IACOB[5], A. SZCZUREK[1,6], S. VARAS[1], J. KRZAK[6], O.S. BURSI[8,1], D. ZONTA[7,1], A. LUKOWIAK[8], G.C. RIGHINI[9], M. FERRARI[1], **A. CHIASERA**[1], [1]IFN-CNR CSMFO Lab. and FBK Photonics Unit, Povo, Trento, Italy; [2]IFN-CNR, Milano,

Italy; [3]Dept. of Materials Technology, Fac. of Applied Sciences, Ho Chi Minh City University of Technology and Education, Thu Duc District, Ho Chi Minh City, Vietnam; [4]The Technical University of Munich, TranslaTUM, München, Germany; [5]Fondazione Bruno Kessler, Centre for Materials and Microsystems, Micro Nano Facility, Povo, Trento, Italy; [6]Dept. of Mechanics, Materials and Biomedical Eng., Wroclaw University of Science and Technology, Wroclaw, Poland; [7]Dept. of Civil, Environmental and Mechanical Eng., University of Trento, Mesiano, Trento, Italy; [8]Institute of Low Temperature and Structure Research, PAS, Wroclaw, Poland; [9]MiPLab, IFAC-CNR, Sesto Fiorentino, Italy

CL-5:IL05 **Tellurite Glass Devices Integrated on Silicon Photonic Chips**
J. BRADLEY, Department of Engineering Physics, McMaster University, Hamilton, Ontario, Canada

Session CL-6
Advances in characterization techniques

CL-6:IL01 **Correlating the 3D Structure of Nanoparticles with their Optical Properties**
W. ALBRECHT, T. MILAGRES DE OLIVEIRA, S. BALS, Electron Microscopy for Materials Science and NANOlab Center of Excellence, University of Antwerp, Antwerp, Belgium; P. SPAETH, S. ADHIKARI, M. ORRIT, Huygens-Kamerlingh Onnes Laboratory, University of Leiden, Leiden, The Netherlands; X. ZHUO, A. SÁNCHEZ-IGLESIAS, L.M. LIZ-MARZÁN, BioNanoPlasmonics Laboratory, CICbiomaGUNE, Donostia-San Sebastián, Spain; A. GUERRERO-MARTÍNEZ, G. GONZÁLEZ-RUBIO, Departamento de Química Física, Universidad Complutense de Madrid, Madrid, Spain

CL-6:IL02 **XPS Characterization Techniques for Novel Materials and Structures**
G. SPERANZA[1,2,3], LAM THI NGOC TRAN[2,4,5], V. MICHELI[2], A. CHIASERA[2], A. CHIAPPINI[2], M. FERRARI[2,6], [1]CMM - FBK, Trento, Italy; [2]IFN - CNR CSMFO Lab. & FBK CMM, Povo, Trento, Italy; [3]Department of Material Engineering, University of Trento, Trento, Italy; [4]Department of Civil, Environmental and Mechanical Engineering, University of Trento, Trento, Italy; [5]Department of Applied Sciences, Ho Chi Minh City University of Technology and Education, Thu Duc District, Ho Chi Minh City, Vietnam; [6]Enrico Fermi Centre, Roma, Italy

CL-6:IL03 **Photon Avalanche Nanoparticles for Bio-medical Applications - Novel Materials, Techniques and Future Challenges**
A. BEDNARKIEWICZ[1], J. SCHUCK[2], E. CHAN[3], B. COHEN[3, 4], A. KOTULSKA[1], M. SZALKOWSKI[1], Z. KORCZAK[1], M. DUDEK[1], K. PROROK[1], L. MARCINIAK[1], [1]Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Wroclaw, Poland; [2]Department of Mechanical Engineering, Columbia University, New York, NY, USA; [3]The Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA, USA; [4]Division of Molecular Biophysics & Integrated Bioimaging, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

CL-6:IL04 **Unraveling the Role of Up-conversion Photonics for Enhancing Photocatalysis: Up-conversion, what else?**
J. MÉNDEZ-RAMOS[1], A. MENÉNDEZ-VELÁZQUEZ[2], P. ACOSTA-MORA[1], J. DEL-CASTILLO[1], S. TORRES-GARCÍA[1], C. HERNÁNDEZ-ÁLVAREZ[1], M. MEDINA-ALAYÓN[1], A.C. YANES[1], N.M. KHAIDUKOV[3], [1]Departamento de Física, Universidad de La Laguna, La Laguna, Tenerife, Spain; [2]Centro Tecnológico IDONIAL, Parque Empresarial PEPA, Avilés, Asturias, Spain; [3]Russian Academy of Sciences, Moscow, Russian Federation

CL-6:IL05 **Residual Stress and Refractive Index Profiles in Silicate Glasses processed by Ion Exchange**
G. MACRELLI, Isoclima SpA, R&D Department, Este, Italy

CL-6:IL06 **Terahertz Time-domain Spectroscopy of Amorphous System**
TATSUYA MORI, University of Tsukuba, Tsukuba, Japan; Y. FUJII, Ritsumeikan University, Kusatsu, Japan; S. KITANI, Tokyo Institute of Technology, Yokohama, Japan

Session CL-7
Ongoing applications and forecasts

CL-7:IL01 **MgO-nanoparticle-doped Optical Fibers in Distributed Sensing: Principle, Design, and Applications**
D. TOSI[1], W. BLANC[2], C. MOLARDI[1], [1]Nazarbayev University, School of Engineering and Digital Sciences, Nur-Sultan City, Kazakhstan; [2]Université Côte d'Azur, INPHYNI–CNRS UMR 7010, Nice, France

CL-7:IL02 **Glass Lasers for Glass Applications**
SHIBIN JIANG, AdValue Photonics Inc., Tucson, AZ, USA

CL-7:IL03 **Multiscale structured optical glass by direct laser writing**
T. CARDINAL[1], T. GUÉRINEAU[1], A. ABOU-KHALIL[2], L. LOI[2], C. STRUTYNSKI[1], S. DANTO[1], Y. PETIT[1,2], M. DUSSAUZE[3], E. FARGIN[1], L. CANIONI[2], [1]ICMCB, Université Bordeaux, Pessac cedex, France; [2]CELIA, Université Bordeaux, Talence Cedex, France; [3]ISM, Université Bordeaux, Talence Cedex, France

CL-7:L04 **Environmental Infrared Microsensor based on Chalcogenide Materials**
V. NAZABAL[1, 3], M. BAILLIEUL[1, 2, 3], J. CHARRIER[1], C. BOUSSARD-PLEDEL[1], L. BODIOU[1], P. NEMEC[3], K. BOUKERMA[2], E. RINNERT[2], K. MICHEL[4], [1]University of Rennes 1, France; [2]IFREMER, Plouzané, France, [3]University of Pardubice, Czech Republic; [4]BRGM, Orléans, France

CL-7:IL05 **Advanced Ceramics for Terahertz Photonics**
S.K. SUNDARAM, Alfred University, Inamori School of Engineering, The New York State College of Ceramics, Alfred, NY, USA

CL-7:IL06 **Artificial Magnetic Lattices with Magnetic Garnet Films and their Magneto-optic Applications**
MITSUTERU INOUE, Toyohashi University of Technology, Toyohashi, Aichi, Japan

CL-7:L07 **Silica Optical Fibers intended for Space Applications: Probabilistic Approach to Reliability Prediction**
E. SUHIR, Portland State University, Portland, OR and ERS Co., Los Altos, CA, USA

CL-7:IL08 **Metal Oxide Nanoparticles for Ultrafast Switching and Energy Applications**
F. SCOTOGNELLA, Dipartimento di Fisica, Politecnico di Milano, Milano, Italy

SYMPOSIUM CM
DEVELOPMENT AND APPLICATION OF FUNCTIONAL TRANSPARENT CONDUCTING AND SEMICONDUCTING OXIDES

Session CM-1
Fundamentals

CM-1:IL01 **Structure and Properties of Amorphous Oxide Semiconductors**
J.E. MEDVEDEVA, Department of Physics, Missouri S&T, Rolla, MO, USA

CM-1:IL02 **Reinventing inorganic photochromics**
J. MONTERO, L. ÖSTERLUND, Division of Solid-State Physics, The Ångström Laboratory, Uppsala University, Uppsala, Sweden

CM-1:IL03 **The Relationship between the Surface Chemistry and Surface Electronic properties of Functional Transparent Semiconducting Oxides**
M. ALLEN, A. McNEILL, L. CARROLL, R. MARTINEZ-GAZONI, R. REEVES, A. DOWNARD, MacDiarmid Institute for Advanced Materials and Nanotechnology, University of Canterbury, Christchurch, New Zealand

CM-1:IL04 **Doping and Defects in ZnO and Ga2O3**
J.L. LYONS, Center for Computational Materials Science, Naval Research Laboratory, Washington, DC, USA

CM-1:IL05 **Optical and Vibrational Properties of Functional Metal Oxides**
M. MODREANU, Tyndall National Institute, University College Cork, Ireland

CM-1:IL06 **Boosting the Figure of Merit of p-Type Transparent Conductors: Degenerate CuI Thin Film Synthesized at Room Temperature**
CHANG YANG, East China Normal University, Shanghai, China; M. LORENZ, M. GRUNDMANN, University of Leipzig, Leipzig, Germany

CM-1:IL07 **Role of Native Defects and Electronic Structure in the Performance of Transparent Conductors**
C.G. VAN DE WALLE, Materials Department, University of California, Santa Barbara, CA, USA

CM-1:IL08 **Doping and Electronic Transport Properties of Transparent Conductive Oxides**
K. ELLMER, Optotransmitter-Umweltschutz-Technologie e.V., Berlin, Germany

CM-1:IL09 **Sub-band-gap Absorption in TCOs**
H. PEELAERS, Department of Physics and Astronomy, University of Kansas, Lawrence, KS, USA

Session CM-2
Material design and device development

CM-2:IL01 **The Discovery and Realization of Multifunctional Polar Oxides**
D. GINLEY[1], L. GARTEN[1,2], S. DWARAKNATH[4], J. WALKER[5], J. MANGUM[3], P. NDIONE[1], Y. PARK[5], D. BEATON[1], V. GOPALAN[5], B.P. GORMAN[3], L. SCHELHAS[6], M.F. TONEY[6], S.E. TROLIER-MCKINSTRY[5], K.A. PERSSON[4], [1]National Renewable Energy Laboratory, Golden, CO, USA; [2]Naval Research Laboratory, Maryland, USA; [3]Colorado School of Mines, Golden, CO, USA; [4]Lawrence Berkeley National Laboratory, Berkeley, CA, USA; [5]The Pennsylvania State University, University Park, PA, USA; [6]SLAC National Accelerator Laboratory, Menlo Park, CA, USA

CM-2:IL02 **Amorphous Oxide Semiconductor Resistive Switching Materials and Devices**
J. DEUERMEIER, M. PEREIRA, E. CARLOS, C. SILVA, R. MARTINS, E. FORTUNATO, A. KIAZADEH, i3N/CENIMAT, Department of Materials Science, NOVA School of Science and Technology and CEMOP/UNINOVA, NOVA University Lisbon, Campus de Caparica, Caparica, Portugal

CM-2:IL03 **Recent Advances in Ga2O3 Electronic Devices**
Z. XIA, N. KALARICKAL, S. DHARA, H. ZHAO, **S. RAJAN**, ECE Department, The Ohio State University, Columbus, OH, USA

CM-2:IL04 **Searching for New Transparent Conducting and Electride Materials using High-throughput Computational Screening**
G. HAUTIER, Thayer school of Engineering, Dartmouth College, Hanover, NH, USA

CM-2:IL05 **Electrochromism : Combination of Materials and Devices Architectures**
A. ROUGIER, ICMCB, Pessac, France

CM-2:IL06 **Epitaxial Copper Iodide Thin Films grown by Pulsed Laser Deposition**
M. LORENZ, Universität Leipzig, Felix Bloch Institute for Solid State Physics, Leipzig, Germany

CM-2:IL07 **Ga2O3-based Heterostructures for Various Polymorphs**
M. GRUNDMANN, Felix Bloch Institute for Solid State Physics, Universität Leipzig, Leipzig, Germany

CM-2:IL08 **Epitaxial Growth Parameters for Phase Selection of Ga2O3 Epilayers**
R. FORNARI, P. MAZZOLINI, F. MEZZADRI, University of Parma, Parma, Italy; M. BOSI, L. SERAVALLI, IMEM-CNR Institute, Parma, Italy

CM-2:IL09 **Stabilization of High-temperature Polymorphs of SrSnO3 at Room Temperature via Epitaxy**
B. JALAN, Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, USA

CM-2:IL10 **Solution Processed ITO Thin Films for Optoelectronic Applications**
R.A. GERHARDT, N. XIA, S. SETHURAMAN, S. JOSHI, Georgia Institute of Technology, Atlanta, GA. USA

CM-2:IL11 **Combinatorial Epitaxial Growth and High-throughput Physical Property Screening of Monoclinic, Orthorhombic and Rhombohedral Ternary Group-III Sesquioxide Alloys**
H. VON WENCKSTERN, M. KNEISS, A. HASSA, C. STURM, D. SPLITH, M. LORENZ, M. GRUNDMANN, Felix-Bloch-Institut für Festkörperphysik, Universität Leipzig, Leipzig, Germany

Session CM-3
Applications

CM-3:IL01 **Transparent Conducting Materials for High Efficiency Solar Cells**
M. MORALES-MASIS, MESA+ Institute, University of Twente, Enschede, The Netherlands

CM-3:IL02 **Resolving the Metal Insulator Transition Mechanism for Nb Oxides for Memristor Applications**
WEI-CHENG LEE, L.F.J. PIPER, Department of Physics, Applied Physics, and Astronomy, Binghamton University, Binghamton, NY, USA

CM-3:IL03 **Flexible and Autonomous Electronics using Sustainable Thin Film and Nanostructured Oxides**
A. ROVISCO, A. SANTA, M. PEREIRA, J. MARTINS, R. BRANQUINHO, R. IGREJA, E. FORTUNATO, R. MARTINS, **P. BARQUINHA**, i3N/CENIMAT, Department of Materials Science, NOVA School of Science and Technology and CEMOP/UNINOVA, NOVA University Lisbon, Campus de Caparica, Caparica, Portugal.

CM-3:IL04 **High-k Dielectrics based on Solution Processed Composite Oxides for Metal Oxide Thin Film Transistors**
G. ADAMOPOULOS, Engineering Department, Lancaster University, Lancaster, UK

SYMPOSIUM CN
GEOPOLYMERS, INORGANIC POLYMERS AND SUSTAINABLE MATERIALS

Session CN-1
Processing and microstructure

CN-1:IL01 **Advances in Understanding the Gel Structure of Geopolymers**
B. WALKLEY, Department of Chemical and Biological Engineering, The University of Sheffield, Sheffield, UK

CN-1:IL02 **How to Control the Porosity of Dense Geopolymer?**
S. ROSSIGNOL, IRCER, University of Limoges, Limoges, France

CN-1:IL03 **Hybrid Cements: Processing and Structural Characterization**
I. GARCIA-LODEIRO, A. PALOMO, A. FERNÁNDEZ-JIMENEZ, Eduardo Torroja Institute (Ietcc-CSIC), Madrid, Spain

CN-1:IL04 **Effect of Dispersed Phases on the High-temperature Behavior of Alkali-activated Composites**
M.C. BIGNOZZI, Dept. of Civil, Chemical, Environmental and Materials Engineering, University of Bologna, Bologna, Italy

CN-1:IL05 **Development of Geopolymers from Alkaline-activated Construction and Agricultural Waste**
F.A. CORPAS IGLESIAS, J.M. TERRONES SAETA, J. SUARES MACIAS, O. HERNANDO LAGUNA, Jaen University, Linares, Spain

CN-1:IL06 **Utilization of Mine Tailings in Alkali Activated Materials**
M. ILLIKAINEN, P. PERUMAL, Fibre and Particle Engineering Research Unit, University of Oulu, Oulu, Finland

CN-1:IL07 **Cordierite and SiAlON Foams from the Thermal Treatment of Geopolymer-like Hardened Suspensions**
A. RINCON[1], H. ELSAYED[1], F. DOGRUL[2], P. RABELO MONICH[1,2], **E. BERNARDO**[1], [1]University of Padova, Dept. of Industrial Engineering, Padova, Italy; [2]University of Trencin, FunGlass (Centre for Functional and Surface Functionalized Glass), Slovakia

CN-1:IL08 **A Different Approach for a Sustainable Binder: the Extraordinary Leuven Cement**
Y. PONTIKES, KU Leuven, Department of Materials Engineering, Leuven, Belgium

CN-1:L09 **Effect of Silica and Lignocellulosic Additives on the Formation and the Distribution of Meso and Macropores in Foam Metakaolin-based Geopolymer Filters for Dyes and Wastewater Filtration**
M. YOUMOUE[1], R.T. TENE FONGANG[3], A. GHARZOUNI[2], R. CYRIAQUE KAZE[4], E. KAMSEU[3], V.M. SGLAVO[5], I. TONLE KENFACK[1], B. NAIT-ALI[2], S. ROSSIGNOL[2], [1]RU-NOCHEE, Research Unit of Noxious Chemistry and Environmental Engineering, Faculty of Science, University of Dschang, Dschang, Cameroon; [2]Institut de Recherche sur les céramiques (IRCER), CNRS 7315, CEC Université de Limoges, Limoges, France; [3]Local Materials Promotion Authority (MIPROMALO), Yaounde, Cameroon; [4]Laboratory of Applied Inorganic Chemistry, Faculty of Science, University of Yaoundé I, Yaoundé, Cameroon; [5]Department of Materials Engineering and Industrial Technologies, University of Trento, Trento, Italy

CN-1:IL10 **Mesoporous Geopolymers for Fire Resistant Insulating Panels**
C. LEONELLI[1], E. KAMSEU[1, 2], [1]Dipartimento di Ingegneria "Enzo Ferrari", Università degli Studi di Modena e Reggio Emilia, Modena, Italy; [2]Laboratory of Materials, Local Materials Promotion Authority, MINRESI/MIPROMALO, Yaoundé, Cameroon

CN-1:IL11 **Effect of the Chemical Admixtures on the Geopolymer Properties based on Glass Powder**
T.M. TOGNONVI, A. BALAGUER PASCUAL, A. TAGNIT-HAMOU, K.P. KOBA, Department of Civil Engineering, University of Sherbrooke, Sherbrooke Quebec, Canada; Department of Physics Chemistry, University of Peleforo Gon Coulibaly, Korhogo, Cote d'Ivoire; Department of applied geology, University of Jean Lorougnon Guede, Daloa, Cote d'Ivoire

CN-1:L12 **Large Scale Additive Manufacturing of Inorganic Geopolymer Components Using Binder Jetting**
H. ELSAYED[1,2], F. GOBBIN[1,3], M. PICICCO[1,4], A. ITALIANO[3], P. COLOMBO[1,5], [1]Department of Industrial Engineering, University of Padova, Padova, Italy; [2]Refractories, Ceramics and Building Materials Department, National Research Centre, Cairo, Egypt; [3]Desamanera Srl, Rovigo, Italy; [4]Centro de Tecnología de Recursos Minerales y Cerámica (CETMIC), Gonnet (La Plata), Argentina; [5]Department of Materials Science and Engineering, Pennsylvania State University, University Park, PA, USA

CN-1:L13 **Role of Sodium Cations in the Formation of Inorganic Polymers Containing Zeolite Phase during Alkaline Activation of Metakaolinite-silica Mixtures**
M. GILDA[1], I. SOBRADOS[2], H. BEN RHAIEM[1], J. SANZ[2], A. BEN HAJ AMARA[1], [1]Laboratoire de Physique des Matériaux Lamellaires et Nanomatériaux Hybrides, Faculté des Sciences de Bizerte, Université de Carthage, Zarzouna, Tunisia; [2]Instituto Ciencia de Materiales, CSIC, Cantoblanco, Madrid, Spain

CN-1:L14 **Study of Hybrid Binders with Fly Ash, Ground Granulated Blast Furnace Slag and Silica Fume in a Calcium Sulfoaluminate Belitic Cement Matrix**
L.I. RODRÍGUEZ-BARBOZA, L.Y. GOMEZ ZAMORANO, Universidad Autónoma de Nuevo León, Facultad de Ingeniería Mecánica y Eléctrica, Centro de Investigacion y Desarrollo Tecnologico, San Nicolás, Nuevo León, México

Session CN-2
Properties

CN-2:IL01 **Nuclear Waste Encapsulation in Geopolymer**
D. LAMBERTIN, CEA, DES, ISEC, DE2D, SEAD, LCBC, Univ Montpellier, Marcoule, France

CN-2:IL02 **Mixture Proportioning for Geopolymer Concrete**
CAIJUN SHI, NING LI, ZUHUA ZHANG, Key Laboratory for Green & Advanced Civil Engineering Materials and Application Technology of Hunan Province, College of Civil Engineering, Hunan University, Changsha, China

CN-2:L03 **High Shear Wet Granulation of Geopolymer and Geopolymer-Zeolite Powders for CO2 Adsorption**
M. MURACCHIOLI, G. FRANCHIN, P. COLOMBO, University of Padua, Padua, Italy; R. GIRIMONTE, F. TESTA, M. TURANO, University of Calabria, Rende, Italy

CN-2:L04 **Geopolymer Materials developed in a Configuration Suitable for Photovoltaic Application**
A. BAFTI, F. BRLEKOVIĆ, V. MANDIĆ, I. PANŽIĆ, Faculty of Chemical Engineering and Technology, Zagreb, Croatia; L. PAVIĆ, Ruđer Bošković Institute, Zagreb, Croatia; G. MALI, National Institute of Chemistry, Ljubljana, Slovenia

CN-2:L05 **Alkali Activation of Ceramic Waste for Thermal Insulation Application**
G. MASI, M.C. BIGNOZZI, Department of Civil, Chemical, Environmental and Materials Engineering, University of Bologna, Bologna, Italy

CN-2:IL06 **Chemical and Environmental Assessment of Alkali Activated Materials based on Different Precursors**
I. LANCELLOTTI, University of Modena and Reggio Emilia, Dept. of Engineering Enzo Ferrari, Modena, Italy

CN-2:IL07 **Physical and Chemical Properties of Silico-aluminophosphate Geopolymer with Modified Activator and Precursor**
JIAN-GUO DAI, YAN-SHUAI WANG, The Hong Kong Polytechnic University, Department of Civil and Environmental Engineering, Hung Hom, Kowloon, Hong Kong, China

CN-2:L08 **Chemical and Antibacterial Properties of Al2O3-corundum Powders in MK-geopolymer Matrix**
G. DAL POGGETTO[1], L. BARBIERI[1], M. CATAURO[2], C. LEONELLI[1], [1]Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy; [2]Department of Industrial Engineering, University of Campania "Luigi Vanvitelli", Aversa, Italy

Session CN-3
Structural and functional applications

CN-3:IL01 **3D Printing of Geopolymer for Construction Applications**
B. NEMATOLLAHI, SHIN HAU BONG, Swinburne University of Technology, Hawthorn, Australia

CN-3:IL02 **Geopolymer Beads and Applications**
E. PAPA, E. LANDI, V. MEDRI, CNR-ISTEC, Faenza, Italy

CN-3:L03 **Application of Geopolymers for the Processing of Waste dust Generated during Kaolin Burning**
J. URBANEK, P. ANTOŠ, Technopark Kralupy, University of Chemistry and Technology, Prague, Czech Republic

CN-3:L04 **Influence of Metakaolins Reactivity on the Properties of Geopolymers**
W. N'CHO, J. JOUIN, S. ROSSIGNOL, IRCER, Institute for Research on Ceramics (UMR CNRS 7315), European Center for Ceramics, Limoges Cedex, France

CN-3:IL05 **Geopolymers for Nuclear Waste Disposal Applications**
N. TEXIER-MANDOKI, Andra, Châtenay-Malabry, France

CN-3:IL06 **Geopolymer-based Heterogeneous Catalysts: Potential and Future Prospects**
M.I.M. AL-ZEER, M. ILLIKAINEN, Fibre and Particle Engineering Research Unit, University of Oulu, Oulu, Finland

CN-3:L07 **Asymmetric Metakaolin-based Geopolymer Membranes: Synthesis and Characterization**
A. FILIPPONI, G. MASI, S. BANDINI, M.C. BIGNOZZI, University of Bologna, Department of Civil, Chemical, Environmental and Materials Engineering, Bologna, Italy

CN-3:IL08 **Corrosion of Reinforcing Steel in Alkali Activated Building Materials**
M. SERDAR, A. RUNCI, Department of Materials, Faculty of Civil Engineering, University of Zagreb, Croatia

CN-3:IL09 **Porous Waste-based Inorganic Polymers for Innovative Applications**
R.M. NOVAIS, J. CARVALHEIRAS, J.A. LABRINCHA, Department of Materials and Ceramic Engineering / CICECO-Aveiro Institute of Materials, University of Aveiro, Campus Universitário de Santiago, Aveiro, Portugal

Session CN-4
Definitions of geopolymers and alkali activated materials

CN-4:IL01 **Technical Assessment and Regulation for Alkali Activated Building Products**
V. DUCMAN, K. TRAVEN, M. PAVLIN, B, HORVAT, ZAG, Ljubljana, Slovenia

CN-4:IL02 **New Cements for the 21st Century: The Pursuit of an Alternative to Portland Cement**
A. FERNÁNDEZ-JIMÉNEZ, I. GARCIA-LODEIRO, A. PALOMO, Eduardo Torroja Institute (Ietcc-CSIC), Madrid, Spain

CN-4:L03 **Variability of Mix Design used for Pilot Production of Façade Panels: the Influence on Mechanical Properties, Microstructure and Leaching Behavior**
M. PAVLIN, B. HORVAT, V. DUCMAN, Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia; B. MATKO, A. PAVLIN, Termit d.d., Moravče, Slovenia

CN-4:L04 **Olive Pomace Ash as an Alternative Alkaline Activator of Electric Arc Steel Slags in the Manufacture of Alkaline Activated Cements**
D. ELICHE-QUESADA, F. ANDRES-CASTRO, M.A. GÓMEZ-CASERO, L. PÉREZ-VILLAREJO, J.S. BUENO-RODRÍGUEZ, Department of Chemical, Environmental, and Materials Engineering, Higher Polytechnic School of Jaén, University of Jaen, Jaén, Spain

CN-4:IL05 **Alkali-activated Materials: Classification**
P. KRIVENKO, Scientific Research Institute for Binders and Materials, Kyiv National University of Construction and Architecture, Kyiv, Ukraine

CN-4:IL06 **Tools of NMR to Understand Geopolymers**
I. SOBRADOS DE LA PLAZA, Instituto de Ciencia de Materiales de Madrid, Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain

CN-4:IL07 **Laterites (natural iron-rich aluminosilicates) as Sustainable Raw Solid Precursor for Geopolymers**
E. KAMSEU[1,2], R. KAZE[1], C. LEONELLI[2], [1]Local Materials Promotion Authory/ MIPROMALO, Yaoundé, Cameroon; [2]Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy

SYMPOSIUM CO
SCIENCE AND TECHNOLOGY FOR SILICATE CERAMICS

Session CO-1
Green and sustainable silicate ceramics

CO-1:IL01 **Wastes as Sustainable Raw Materials for the Manufacture of Fired Clay Bricks. Towards a Circular Economy**
P. MUÑOZ VELASCO, R. SANCHEZ-VÁZQUEZ, L. MUÑOZ-VELASCO, V. LETELIER-GONZALEZ, Universidad Internacional de La Rioja, Logroño, Spain

CO-1:IL02 **Influence of Coal Ashes on Fired Clay Brick Quality using Random Forest Method**
M.V. VASIĆ[1], L.L. PEZO[2], Z.M. RADOJEVIĆ[1], [1]Institute for Testing of Materials IMS, Belgrade, Serbia; [2]University of Belgrade, Institute of General and Physical Chemistry, Belgrade, Serbia

CO-1:L03 **Valorization of Eggshell Waste, as a Source of Calcium Carbonate, in Ceramic Wall Tiles**
I. VILARINHO, E. FILIPPI, M.P. SEABRA, CICECO - Aveiro Institute of Materials, Department of Materials and Ceramic Engineering, University of Aveiro, Aveiro, Portugal.

CO-1:L04 **Exploring Waste-based Body Formulations for Porcelain Stoneware Tiles**
C. ZANELLI, S. CONTE, C. MOLINARI, G. GUARINI, M. DONDI, CNR-ISTEC, Faenza, Italy

CO-1:IL05 **A New Paradigm to Satisfy the Global Expectation of Economically Reasonable Slip Resistance Life Cycle Performance**
R. BOWMAN, Intertile Research, Brighton East, VIC, Australia

CO-1:IL06 **Circular Economy in Ceramic Production: Examples**
L. PEREZ VILLAREJO, D. ELICHE-QUESADA, Department of Chemical, Environmental, and Materials Engineering, Higher Polytechnic School of Jaén, University of Jaen, Jaén, Spain

CO-1:L07 **Bottom Ashes from Biomass Combustion as Secondary Raw Materials in Porcelain Stoneware Bodies**
S. CONTE[1], D. BUONAMICO[2], T. MAGNI[2], R. ARLETTI[2], M. DONDI[1], G. GUARINI[1], C. ZANELLI[1], [1]ISTEC-CNR, Faenza, Italy; [2]Università degli Studi di Modena e Reggio Emilia, Italy

CO-1:IL08 **Recycling of Unserviceable Glass Packaging into Clay Ceramics**
C.M. FONTES VIEIRA[1], G.C. GIRONDI DELAQUA[1], L.R. DE AZEREDO[2], [1]Advanced Materials Laboratory-LAMAV, State University of the North Fluminense-UENF, Campos dos Goytacazes, Rio de Janeiro, Brazil; [2]Federal Institute of Education, Science and Technology Fluminense. Campos dos Goytacazes, Rio de Janeiro, Brazil

Session CO-2
Coating and decoration of silicate ceramics

CO-2:IL01 **Ceramic Frit Containing Copper Slags: Application and Life Cycle Assessment**
C. SILIGARDI, Department of Engineering Enzo Ferrari, University of Modena and Reggio Emilia, Modena, Italy; A.M. FERRARI, Department of Sciences and Methods for Engineering, University of Modena and Reggio Emilia, Reggio Emilia, Italy

CO-2:IL02 **A New Concept for Inkjet Technology-based Coatings**
J.L. AMORÓS, **A. MORENO**, E. BLASCO, Instituto de Tecnología Cerámica (ITC), Asociación de Investigación de las Industrias Cerámicas (AICE), Universitat Jaume I de Castellón, Castellón, Spain

CO-2:L03 **Effect of Ink Micronization on Pigments Physical and Technological Properties**
C. MOLINARI, C. ZANELLI, S. CONTE, M. DONDI, CNR-ISTEC, Faenza, Italy; M. ARDIT, G. CRUCIANI, Dept. Physics and Earth Sciences, University of Ferrara, Ferrara, Italy

CO-2:IL04 **Recent Advances on Inorganic Pigments: Towards the High NIR Reflectance**
G. MONRÓS, M. LLUSAR, J. BADENES, Dept. of Inorganic and Organic Chemistry, Jaume I University, Castellón, Spain

CO-2:L05 **High Reflective Engobes for Ink-jet Printed Colored Porcelain Stoneware Tiles**
E.I. CEDILLO-GONZÁLEZ, M. GOVERNATORI, C. SILIGARDI, Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy

CO-2:L06 **Development of Matt Floor Tile Glazes with Improved Color Perception by Tailored Crystallization**
S.O. VARISLI, F. TASKIRAN, Akcoat R&D Center, Ceramic Coatings Division, Sakarya, Turkey & Yıldız Technical University, Istanbul, Turkey; U. AKKASOGLU, B. OZTURK, S. OZTURK, Akcoat R&D Center, Ceramic Coatings Division, Sakarya, Turkey; B. CICEK, Yıldız Technical University, Istanbul, Turkey; S. YILMAZ, Sakarya University, Sakarya,Turkey

Session CO-3
Surface properties and smart silicate ceramics

CO-3:IL01 **New Challenges and Opportunities for Sustainable Ceramic Tiles Fighting Viruses and Bacteria**
E. RAMBALDI, ITALCER Group, Rubiera (RE), Italy

CO-3:IL02 **Photo-catalytic Coatings for Water Treatment**
U. LAVRENCIC STANGAR, L. MATOH, B. ZENER, Faculty of Chemistry and Chemical Technology, University of Ljubljana, Slovenia; K. MAVER, University of Nova Gorica, Slovenia; I. ARCON, University of Nova Gorica, Slovenia and Jozef Stefan Institute, Ljubljana, Slovenia

CO-3:IL03 **Textured Clay Composite Materials and Improved Mechanical Properties**
N. TESSIER-DOYEN, G. LECOMTE-NANA, I. DAOU, P. BLANCHART, J. BOURRET, D.S. SMITH, C. PEYRATOUT, R. GUINEBRETIÈRE, C. PAGNOUX, P.-M. GEFFROY, University of Limoges, Limoges Cedex, France

CO-3:IL04 **Additive Manufacturing Techniques Applied to Ceramic Tile Surface Structuring**
D.N. BOCCACCINI[1], F. ANDREOLA[2], M. ROMAGNOLI[2], M. CANNIO[2], V. RIVA[3], F. SCOCCA[4], A. PALLADINI[1], A. LASAGNI[5], A.R. BOCCACCINI[6], [1]Tecnoitalia, Sassuolo, Sassuolo (MO), Italy; [2]Dipartimento di Ingegneria Enzo Ferrari, Università di Modena e Reggio Emilia, Modena, Italy; [3]Metco S.r.l., Fiorano Modenese - MO, Italy; [4]M.S. Materiali Speciali S.r.l., Sassuolo, MO, Italy; [5]Institut für Fertigungstechnik, Technische Universität Dresden, Dresden, Germany; [6]Institute of Biomaterials, Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Erlangen, Germany

CO-3:IL05 **The Influence of Surface Microstructure on Ceramic Tile Life Cycle Performance**
M. ENGELS, Forschungsinstitut für Anorganische Werkstoffe-Glas-Keramik-GmbH, Höhr-Grenzhausen, Germany

CO-3:L06 **Influence of Crystallinity on Surface Roughness and Slip Resistance of Glazed Porcelain Tiles**
F. TASKIRAN, S.O. VARISLI, Akcoat R&D Center, Ceramic Coatings Division, Sakarya, Turkey & Yıldız Technical University, Istanbul, Turkey; U. AKKASOGLU, B. OZTURK, Akcoat R&D Center, Ceramic Coatings Division, Sakarya, Turkey; B. CICEK, Yıldız Technical University, Istanbul, Turkey

CO-3:IL07 **Microstructure-oriented Porcelain Stoneware Tile Composition Design**
A. DE NONI Jr., RODRIGO RAMOS SILVA, Chemical Engineering Department, Federal University of Santa Catarina, Florianopolis, Brazil

Session CO-4
Properties and performance of silicate ceramics

CO-4:IL01 **Detailed Characterization of Amorphous and Crystalline Phases Coupled with Size-strain Analysis by Rietveld Refinement**
F. KRISTÁLY, Institute of Mineralogy and Geology, University of Miskolc, Miskolc-Egyetemváros, Hungary

CO-4:IL02 **Sintered Glass-ceramics, Crystallization Induced Shrinkage and Crystallization Induced Porosity**
A. KARAMANOV, Institute of Physical Chemistry "Acad. Rostislaw Kaishew", Bulgarian Academy of Sciences, Sofia, Bulgaria

CO-4:L03 **Feasibility of using Waste Clays as Lightweight Aggregates**
T. KRONBERG, J.-E. ERIKSSON, L. HUPA, Åbo Akademi University, Turku, Finland

CO-4:L04 **Materials Design to Minimize the Water Absorption and Pyroplastic Deformation of Alumina-strengthened Porcelain**
DONG HAO[1], T. AKATSU[1,2], N. KAMOCHI[3], [1]Ceramic Research Center of Saga University, Japan; [2]Faculty of Art and Regional Design, Saga University, Japan; [3]Saga Ceramics Research Laboratory, Japan

CO-4:IL05 **New Parameters for Assessing Brick Resistance to Freeze-thaw Cycles**
I. NETINGER GRUBEŠA, J.J. STROSSMAYER, University of Osijek, Faculty of Civil Engineering and Architecture Osijek, Osijek, Croatia

CO-4:IL06 **Evolution of Thermophysical Properties of Kaolin Based Clay Materials**
D.S. SMITH, Institut de Recherche sur les Céramiques (CNRS 7315), University of Limoges, Limoges, France

CO-4:IL07 **Brazilian Analyses of Some Local and Imported Ceramic Tile Characteristics**
A.P. MARGARIDO MENEGAZZO, M. DIAS CARIDADE, F.D. DA SILVA, B.F. CASTELO, Centro Ceramico do Brasil-, Santa Gertrudes, Sao Paulo, Brazil

CO-4:L08 **Numerical Analysis of Porcelain Tile Manufacturing by Integrated Process Simulation**
C.L. ALVES[1], A. DE NONI Jr.[2], D. HOTZA[2,4], J.B. RODRIGUES NETO[4], S.Y. GÓMEZ GONZÁLEZ[2], R. JANSSEN[3], S. HEINRICH[1], M. DOSTA[1], [1]Institute of Solids Process Engineering and Particle Technology, Hamburg University of Technology (TUHH), Hamburg, Germany; [2]Department of Chemical Engineering (EQA), Federal University of Santa Catarina (UFSC), Florianópolis, SC, Brazil; [3]Institute of Advanced Ceramics, Hamburg University of Technology (TUHH), Hamburg, Germany; [4]Graduate Program in Materials Science and Engineering (PGMAT), Federal University of Santa Catarina (UFSC), Florianópolis, SC, Brazil

SYMPOSIUM CP
REFRACTORY MATERIALS CHALLENGES TO MEET CURRENT AND FUTURE INDUSTRY NEEDS

Session CP-1
Raw materials needs

CP-1:IL01 **Effectiveness and Application of Novel Calcium Magnesium Aluminates in Refractory Bricks and Monolithics**
C. WÖHRMEYER, J. GAO, C. PARR, M. SZEPIZDYN, P. EDWARDS, C. DETEUF, IMERYS, Oberhausen, Germany

CP-1:IL02 **Synthesis of Aluminum Silicon Carbide and its Application**
HATSUO TAIRA, T. MAEDA, S. UCHIDA, Okayama Ceramics Research Foundation, Bizen, Okayama, Japan

Session CP-2
Product testing and quality control

CP-2:IL01 **ATHORNA: An Innovative Device for Monitoring Thermal Shock Behaviour of Refractories Combining Various In-situ Advanced Measurements**
M. HUGER[1], R. KACZMAREK[1], R. OLIVEIRA[2], M. MOUIYA1, 3, J.-C. DUPRÉ[4], P. DOUMALIN[4], N. TESSIER-DOYEN[1], Y. TAMRAOUIA3, O. POP[5], [1]University of Limoges, UMR CNRS 7315 - IRCER, Centre Européen de la Céramique, Limoges, France; [2]University of Coimbra, ISISE Inst., Dept. of Civil Eng., Coimbra, Portugal; [3]University Mohammed VI Polytechnic, MSN Dept, Ben Guerir, Morocco; [4]University of Poitiers, Pprime Inst., UPR CNRS 3346, Futuroscope Chasseneuil, France; [5]University of Limoges, GC2D, Egletons, France

CP-2:IL02 **In Situ Raman Analysis of Refractory Materials**
M.R. AMMAR, Y. HBIRIQ, E.S. FOTSO GUEUTUE, J. KADOK, N. BOST, R. MICHEL, A. CANIZARES, J. POIRIER, P. SIMON, L. HENNET, CEMHTI-CNRS, Orleans, France

CP-2:L03 **Influence of the Mg-Al Spinel Phase Content on Properties of the Alumina-spinel Castables**
K. WARMUZ, J. RAMULT, R. PROROK, D. MADEJ, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Department of Ceramics and Refractories, Kraków, Poland

CP-2:L04 **Characterization of Aluminium Titanate based Materials: Thermomechanical Properties related to Microstructure**
M. MOUIYA[1, 2], N. TESSIER-DOYEN[2], Y. TAMRAOUI[1], J. ALAMI[1], M. HUGER[2], [1]Materials Science, Energy and Nanoengineering Dept., University Mohammed VI Polytechnic (UM6P), Ben Guerir, Morocco; [2]University of Limoges, Inst. of Research for Ceramics (IRCER), UMR 7315, European Ceramics Center, Limoges Cedex, France

CP-2:L05 **Investigation of Corrosion Resistance to Industrial Slag of Spinels Differing MgO/Al2O3 in the Molar Ratio**
J. RAMULT, K. WARMUZ, R. PROROK, D. MADEJ, AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Dept. of Ceramics and Refractories, Kraków, Poland

Session CP-3
Specialized refractory use / issues

CP-3:IL01 **Refractory Wear and Freeze Lining Formation in Platinum Group Metal Smelters**
A. GARBERS-CRAIG, Centre for Pyrometallurgy, Department of Materials Science & Metallurgical Engineering, University of Pretoria, Pretoria, South Africa

CP-3:IL02 **Multi-component Refractory Systems Reinforced for Engineering Resilience**
D.G. GOSKI, M.J. LAMBERT, Allied Mineral Products, Inc., Columbus, OH, USA

CP-3:IL03 **The Formation of Hexavalent Chromium and its Inhibition in Corundum Castables**
YAWEI LI, Wuhan University of Science and Technology, Wuhan, China

CP-3:IL04 **Corrosion of Refractories by Metallurgical Slags: Keys Issues and Mechanisms – Steel Ladles Applications**
J. POIRIER, CEMHTI-CNRS, University of Orleans, Orleans, France

CP-3:IL05 **Self-protecting Mechanism of Magnesia Refractory in Electric Arc Furnace (EAF) Operation Conditions: Challenges of Active Use of Direct Reduced Iron (DRI) as an Alternative iron Source**
JINSUNG HAN, Steelmaking Production Technology Team, Hyundai Steel, Dangjin, South Korea; JUNGHO HEO, Department of Materials Engineering, KU Leuven, Kasteelpark, Leuven, Belgium; **JOOHYUN PARK**, Department of Materials Science and Chemical Engineering, Hanyang University, Ansan, South Korea

CP-3:L06 **Innovative Fused Silica Pre-shaped Refractory for Coke Ovens**
L. ROUMIGUIER, A. BOUDET, Belref SA, Saint-Ghislain, Belgium; **F. DELOBEL**, P. PILATE, Belgian Ceramic Research Center, Mons, Belgium

Session CP-4
Modelling and simulation of the process environment

CP-4:IL01 **New Approach and Numerical Method to Compute Reactive Mass Transport in Porous Media Coupled with Thermomechanical Effects**
T. SAYET[1], C.-B. TRANG[1], A. BATAKIS[2], E. DE BILBAO[3], E. BLOND[1], [1]Univ. Orléans, Univ. Tours, INSA CVL, Laboratory of mechanics Gabriel Lamé, EA7494, Orléans, France; [2]Univ. Orléans, Institut Denis Poisson, UMR CNRS 7013, Orléans, France; [3]Univ. Orléans, CEMHTI, UPR CNRS 3079, Orléans, France

CP-4:IL02 **Corrosion of Refractories by Alkali Gas Attack: Thermodynamic Analysis**
IN-HO JUNG, Seoul National University, Seoul, South Korea

CP-4:IL03 **Modelling and Simulation of Alumina Dissolution by Slag with Aluminates Formation**
E. DE BILBAO, CEMHTI, CNRS UPR3079 - Univ. Orléans, Orléans, France

CP-4:L04 **Periodic Thermomechanical Modelling by the Discrete Element Method of Microstructural Aspects within Model Refractory Materials**
Q. PLEDEL[1], M. HUGER[1], D. ANDRE[1], P. DOUMALIN[2], [1]University of Limoges, Institute of Research for Ceramics (IRCER), UMR 7315, European Ceramics Center, Limoges Cedex, France; [2]University of Poitier, Institute Pprime UPR 3346, CNRS, ENSMA, Futuroscope Chasseneuil Cedex, France

Session CP-5
Refractory failure analysis

CP-5:IL01 **Silicon Carbide Refractories: Materials Necessary for Waste Incineration**
P. PILATE, S. ABDELOUHAB, INISLa, Mons, Belgium

CP-5:IL02 **DEM Modelling to Investigate the Impact of Microstructure on Refractory**
D. ANDRÉ, T.-T. NGUYEN, F. ASADI, M. HUGER, University of Limoges, IRCER, UMR CNRS 7315, Limoges, France

CP-5:IL03 **Contributions to Crack Propagation in Coarse Grained Refractories**
D. GRUBER, H. HARMUTH, Chair of Ceramics, Montanuniversitaet, Leoben, Austria

CP-5:IL04 **Towards Corrosion-resistant Refractories**
SHAOWEI ZHANG, University of Exeter, Exeter, UK; JUNFENG CHEN, Wuhan University of Science and Technology, Wuhan, China

Session CP-6
Refractory materials for novel or advanced applications

CP-6:IL01 **Smart Bubbles for Cleaner Metals and Advanced Insulating Refractories**
L.O.Z. FALSETTI, T. DOS SANTOS JR., **V.C. PANDOLFELLI**, Materials Engineering Department, Federal University of São Carlos, São Carlos, SP, Brazil

CP-6:IL02 **The Role of Phosphates in Chrome Oxide Gasifier Refractories**
J.P. BENNETT, **J. NAKANO**, A. NAKANO, H. THOMAS, U.S. Department of Energy National Energy Technology Laboratory, Albany, OR, USA

CP-6:IL03 **The World of Monolithics: A Review of Last Developments and Way of Installation**
P. TASSOT, REFRATECHNIK Steel GmbH, Düsseldorf, Germany

CP-6:IL04 **Freeze Linings vs Brick Linings in the Non-ferrous Metallurgy**
A. MALFLIET, S. VAN WINKEL, L. ZHANG, B. BLANPAIN, Department of Materials Engineering, KU Leuven, Heverlee, Belgium

CP-6:IL05 **Carbon Bonded Foam Structures – Applications as High Temperature Reactive Filters in Combined Refining Filter-systems for Improved Steel Cleanliness**
C. ANEZIRIS, T. WETZIG, E. STORTI, J. HUBALKOVA, **P. GEHRE**, TU Bergakademie Freiberg, Germany

CP-6:L06 **Field Assisted Sintering of Refractory Composite Materials Nb-/Ta-Al2O3 and the Influence on Material Properties**
B. KRAFT, S. WAGNER, M.J. HOFFMANN, KIT, Karlsruhe, Germany; D. ENDLER, TU Bergakademie Freiberg, Freiberg, Germany

CP-6:L07 **Alumina Castables with Addition of Fibers Produced by Electrospinning**
E. STORTI[1], A. JIRÍCKOVÁ[2], S. DUDCZIG[1], J. HUBÁLKOVÁ[1], C.G. ANEZIRIS[1], [1]Institute of Ceramics, Refractories and Composite Materials, TU Bergakademie Freiberg, Freiberg, Germany; [2]University of Chemistry and Technology Prague, Department of Inorganic Chemistry, Prague, Czech Republic

CP-6:IL08 **Anti-oxidation Dipping Treatment in Graphite Electrodes - A New Cost-effective Solution for the Melt Shop**
D. DAS PODDAR, Heatworks Pvt Ltd, Kolkata, India; D. CHONG, Malaysia; X. JOHN, China

CP-6:IL09 **The NCC Castables: Properties, Benefits and Prospects**
HONG PENG, Elkem Silicon Products Development, Kristiansand, Norway

CP-6:IL10 **Development of a Mullite-zirconia Bonded Refractory Brick**
A. VILLALBA WEINBERG, D. GOEURIOT, Laboratoire Georges Friedel, CNRS UMR 5307, MINES, Saint-Étienne, France; J. POIRIER, CEMHTI, CNRS UPR 3079, Université d'Orléans, Orléans, France; C. VARONA, BONY SA, Saint-Étienne, France; X. CHAUCHERIE, SARPI-VEOLIA, Limay, France

CP-6:L11 **A New Eco-friendly and Sustainable Insulating Material for High-temperature Processes**
T. SCHEMMEL[1], V. STEIN[1], P. SEIN[2], [1]Refratechnik Steel GmbH, Düsseldorf, Germany; [2]Refratechnik Holding GmbH, Germany

Session CP-7
Future refractory testing and refractory education needs

CP-7:IL01 **Forecasting New Horizons for the Refractory Research and Education**
J. POIRIER, **M. RIGAUD**, both emeritus professor at Orléans University and École Polytechnique, Montréal, Canada

CP-7:IL02 **Cooperative Refractory Research Programs to Support Refractory Research**
C. PARR, Imerys SA, FIRE, Puteaux, France; S. SINNEMA, Tata Steel, FIRE, The Netherlands

CP-7:IL03 **Advanced 3D Laser Profile Techniques to Inspect and Analyze Hot Refractory Linings**
R. LAMM, MINTEQ International GmbH, Duisburg, Germany

Session CP-8
Refractory materials and manufacturing process changes related to global decarbonization

CP-8:IL01 **Method for Determining the Thermal Expansion Coefficient of Ceramic Bodies and Glazes**
W.M. CARTY, H. LEE, M. RAMISETTY, Alfred University, Alfred, NY, USA

CP-8:IL02 **Refractory Selection for High Temperature Plastic Gasification**
G. PATTERSON, J. NAKANO, HarbisonWalker International, Moon Township, PA, USA

CP-8:L03 **Innovative Refractory Solutions for Lining Furnaces in Energy Intensive Industrial Sectors**
D. OLEVANO, P. MICELI, U. MARTINI, A. DI DONATO, V. RATTO, RINA Consulting Centro Sviluppo Materiali S.p.A., Rome, Italy

CQ - 9th International Conference
ADVANCED INORGANIC FIBRE COMPOSITES FOR STRUCTURAL AND THERMAL MANAGEMENT APPLICATIONS

Session CQ-1
Production and properties of reinforcements, preforms, and matrix materials

CQ-1:IL01 **Development of Oxide Ceramic Fibers for OCMCs**
B. CLAUSS, S. PFEIFER, H.-J. BAUDER, S. KRÖNER, H. STOLPMANN, C. GRELLER, A. RENFFTLEN, L. REINDERS, M. CALISKAN, M.R. BUCHMEISER, German Institutes of Textile and Fiber Research DITF, Denkendorf, Germany

CQ-1:IL02 **Which is the Best SiC Precursor for Chemical Vapor Infiltration and High Temperature Applications?**
A. DESENFANT[1], G. LADUYE[2], S. GOUJARD[3], G. VIGNOLES[1], **G. CHOLLON**[1], [1]Laboratoire des Composites Thermostructuraux, CNRS, Pessac, France; [2]Air Liquide, France; [3]Safran Ceramics, France

CQ-1:IL03 **High Performance SiC Fiber Development and Characterization**
TOSHIHIRO ISHIKAWA, Tokyo University of Science, Yamaguchi (Sanyo-Onoda City University), Japan

CQ-1:L04 **Upscaling of Spinning Processes for Endless Multifilament Ceramic Fibers**
A. RÜDINGER, **R. HERBORN**, H. SCHOLZ, P. VIERHAUS, J. VETTER; Fraunhofer ISC, Center for High Temperature Materials and Design HTL, Bayreuth, Würzburg, Germany

Session CQ-2
Interfaces / Interphases

CQ-2:IL01 **Oxide Fiber Coatings for Lifetime Extension of SiC/SiC Ceramic-matrix Composites**
M.K. CINIBULK[1], E.E. BOAKYE[1, 2], P. MOGILEVSKY[1, 2], R.S. HAY[1], [1]Air Force Research Laboratory, WPAFB, OH, USA; [2]UES, Inc., Dayton, OH, USA

CQ-2:IL02 **Tailoring of CMC Properties by Varying Fiber Matrix Interfaces**
J. MOOSBURGER-WILL, D. KOCH, S. HORN, Institute of Materials Resource Management, University of Augsburg, Augsburg, Germany

CQ-2:IL03 **Integration of Silicon-based Materials to Metals for Thermostructural and Thermal Management Applications**
R. ASTHANA[1], M. SINGH[2], J. MARTINEZ FERNANDEZ[3], F.M. VALERA[3], [1]University of Wisconsin-Stout, Menomonie, WI, USA; [2]Ohio Aerospace Institute, Cleveland, OH, USA; [3]Depto Física de la Materia Condensada-ICMSE, Universidad de Sevilla, Spain

CQ-2:L04 **Evaluation of Fiber Interphase Coatings by Tensile Testing of Fiber Bundles and Minicomposites**
J. MAIER, A. NÖTH, Fraunhofer ISC/Center for High Temperature Materials and Design HTL, Würzburg, Germany

Session CQ-3
Processing and fabrication of MMCS, CMCS, and C/C composites

CQ-3:IL01 **A New Route to Processing CMCs with Controlled and Variable Matrix Composition**
J. BINNER, B. BAKER, V. RUBIO*, University of Birmingham, Birminghan, UK; *Now with the National Composite Centre, Bristol, UK

CQ-3:IL02 **Organomorphic Metal-matrix Composites**
E.A.BOGACHEV, K.S. VOLNYKH, JSC Kompozit, Korolev, Moscow reg., Russia

CQ-3:IL03 **Scaling up of MW-CVI Technology for the Production of CVI SiC-based Ceramic Matrix Composites**
R. D'AMBROSIO, L. ALIOTTA, V. GIGANTE, **A. LAZZERI**, University of Pisa, Dipartimento di Ingegneria Chimica e Industriale, Pisa, Italy

CQ-3:IL04 **Insights in the Infiltration of Molten Silicon in Porous Preforms**
J. ROGER, Univ. Bordeaux, CNRS, CEA, Safran Ceramics, LCTS, UMR 5801, Pessac, France

CQ-3:IL05 **Composites with Oxide Fibres Produced by Internal Crystallization Method**
S.T. MILEIKO, Institute of Solid State Physics of RAS, Chernogolovka Moscow distr., Russia

CQ-3:IL06 **New Matrices Prepared by Film-boiling Process**
L. MAILLÉ[1], C. BESNARD[1], A. ALLEMAND[1, 2], [1]Université de Bordeaux, Laboratoire des Composites ThermoStructuraux UMR 5801, Pessac, France; [2]CEA Le Ripault, Monts, France

CQ-3:IL07 **Numerical Modelling of Densification of Preforms with Non-uniformly Scaled Pores by TG-CVI Process**
A.V. KULIK, M.V. BOGDANOV, STR Group, Inc. - Soft-Impact, Ltd., St. Petersburg, Russia; V.I. KULIK, Baltic State Technical University "VOENMEH", St. Petersburg, Russia

CQ-3:L08 **Thermoset Injection Moulding with Subsequent LSI for C/C-SiC Series Production: Process Analysis and Material Properties**
J. STILLER, D. NESTLER, L. KROLL, Department of Lightweight Structures / Polymer Technology, Chemnitz University of Technology, Chemnitz, Germany

CQ-3:L09 **The Production of Fire-resistant Fibre Metal Laminate (FML) Components for Transport Applications**
C. MINGAZZINI[1], S. BASSI[2], E. LEONI[1], M. SCAFÈ[1], [1]ENEA TEMAF, Faenza, Italy; [2]CNR-ISTEC, Faenza, Italy

Session CQ-4
Property, modeling and characterization

CQ-4:IL01 **Tensile Properties of Fiber-reinforced Ceramic Composites: New Insights from Analysis of Concurrent Fragmentation of Frictionally-coupled Phases**
F.W. ZOK, Materials Department, University of California, Santa Barbara, CA, USA

CQ-4:IL02 **High Temperature Mechanical Testing of CMCs**
P. REYNAUD, N. GODIN, G. FANTOZZI, INSA Lyon - MATEIS, Villeurbanne, France

CQ-4:L03 **Wet Oxidation Behavior of C/SiC–Si(Hf)(B)CN Composites at High Temperature**
XINGANG LUAN, J. ZHANG, L. WANG, Y. ZOU, L. CHENG, R. RIEDEL, Science and Technology on Thermostructural Composite Materials Laboratory, Northwestern Polytechnical University, Xi'an, Shaanxi, China

CQ-4:IL04 **Mechanical and Thermal Properties of Silicon Nitride Ceramics with Fibrous Microstructure**
TATSUKI OHJI, K. HIRAO, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan

CQ-4:IL05 **Image-based Modeling of Woven Ceramic Matrix Composites**
G. COUÉGNAT, J. BÉNÉZECH, V. MAZARS, O. CATY, G.L. VIGNOLES, Laboratoire des Composites Thermostructuraux (CNRS/Univ.Bordeaux/Safran/CEA), Pessac, France

CQ-4:IL06 **Mechanical Properties and Ablation Behavior of Cf/SiBCN Composites at Elevated Temperatures**
DE-WEI NI, QI DING, SHAO-MING DONG, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China

CQ-4:IL07 **Characterization and Modeling of High Temperature Mechanical Properties of CMCs with Silicon Carbide Matrix**
YUAN SHI, F. KESSEL, F. SÜSS, Institute of Structures and Design, German Aerospace Center Stuttgart, Stuttgart, Germany; K. TUSHTEV, Advanced Ceramics, University of Bremen, Bremen, Germany

CQ-4:IL08 **The Mechanical and Thermal Properties of RMI SiC/SiC Composites with Varied Free Silicon Content**
JIANBAO HU, X. ZHANG, J. YANG, S. DONG, State Key Laboratory of High Performance Ceramics and Superfine Microstructure, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China

CQ-4:IL09 **Influence of Interphases on the Thermomechanical Behavior of CVI SiC/SiC Composites**
C. SAUDER, J. BRAUN, C. FELLAH, M-H. BERGER, E. BUET, CEA SACLAY, Gif-Sur-Yvette, France

CQ-4:L10 **Thermophysical and Thermomechanical Characterization of Ceramic Matrix Composites for the Energy-intensive Industry**
L. LAGHI[1], **G. DE ALOYSIO**[1], C. MINGAZZINI[2], S. BASSI[3], M. SCAFÈ[2], A. NOETH[4], J. MAIER[4], [1]Certimac soc.cons.ar.l., Faenza - RA, Italy; [2]ENEA SSPT-PROMAS-TEMAF, Faenza - RA, Italy; [3]CNR-ISTEC, Faenza - RA, Italy; [4]Fraunhofer-Institute for Silicate Research ISC/Fraunhofer, Center for High Temperature Materials and Design, Bayreuth, Germany

Session CQ-5
Composites for thermal management

CQ-5:IL01 **Damage-thermal Diffusivity Relationship in Unidirectional Fibre-reinforced Composites during Axial Tensile Test**
J. LAMON[1, 3], J. EL YAGOUBI[1, 2], [1]Laboratoire des Composites Thermo-structuraux, UMR 5801, Bordeaux University, Pessac, France; [2]Univ. Bordeaux, I2M, UMR 5295, Talence, France; [3]LMT, CNRS/Ecole Normale Superieure Paris-Saclay/University Paris-Saclay, Cachan, France

CQ-5:IL02 **Microstructure-properties Relationships for the Machining of CMCs**
R. GOLLER, A. RÖSIER, P. LEON-PEREZ, Augsburg University of Applied Sciences, Augsburg, Germany

CQ-5:IL03 **Studies on Carbon Fibrous Ablators: From Image-based Modeling to Experimental Determination of Reaction Constants from Plasma Jet Tests**
G.L. VIGNOLES, X. LAMBOLEY, P. BLAINEAU, C. LEVET, O. CATY, University of Bordeaux - CNRS - CEA - Safran : LCTS, Pessac, France; A. TURCHI, D. LE QUANG HUY, O. CHAZOT, Von Karman Institute, Rhode-Saint-Genèse, Belgium; D. BIANCHI, Università La Sapienza, Roma, Italy

CQ-5:IL04 **Progress in Coatings on Ceramic Matrix Composites**
LAIFEI CHENG, Science and Technology on Thermostructural Composite Materials Laboratory, Northwestern Polytechnical University, Xi'an, China

Session CQ-6
Applications

CQ-6:IL01 **C/C-SiC Composites for Next-generation Brake Disks**
W. KRENKEL, T. OPEL, N. LANGHOF, University of Bayreuth, Bayreuth, Germany

CQ-6:IL02 **Silicon carbide and Silicon carbide based Fiber Composites for Fusion**
M. FERRARIS, Politecnico di Torino, Torino, Italy

CQ-6:IL03 **HB-Cesic Mirrors and Telescopes - From Design to Alignment**
M.R. KROEDEL, Y. BASKARAN, ECM Engineered Ceramic Materials GmbH, Moosinning, Germany

CQ-6:IL04 **SiC/SiC Composites in Nuclear Applications**
TATSUYA HINOKI, Kyoto University, Uji, Japan

CR - 9th International Conference
SCIENCE AND ENGINEERING OF NOVEL SUPERCONDUCTORS

Session CR-1
Materials, structure, physical chemistry and general properties

CR-1:IL01 **High TC Superconductivity in Interacting Quasi-2D Sheets at Oxide Interfaces**
D. DI CASTRO, Dipartimento di Ingegneria Civile e Ingegneria Informatica, Università di Roma Tor Vergata, Roma, Italy

CR-1:IL02 **Probing the Structural and Electronic Properties of Materials with Electron and Photon Spectroscopies**
G. BOTTON, McMaster University and Canadian Light Source, Hamilton, Canada

CR-1:IL03 **Superconductivity in Fe(1-x)Se with Different Fe-vacancy Orders**
KUNG-YU YEH, CHI-PIN YAN, YEN-RAI CHEN, TUNG-SHENG LO, PHILLIP WU, MING-JYE WANG, **MAW-KUEN WU**, Institute of Physics, Academia Sinica, Taipei, Taiwan

CR-1:IL04 **ARPES Study of High-Tc Superconductors**
XINGJIANG ZHOU, Institute of Physics, CAS, Beijing, China

CR-1:IL05 **Exploring the Relation between Microstructure and Performance of Superconducting Ceramics**
A. KOBLISCHKA-VENEVA[1,2], M.R. KOBLISCHKA[1,2], [1]Experimental Physics, Saarland University, Saarbrücken, Germany; [2]Shibaura Institute of Technology, Tokyo, Japan

Session CR-2
New superconductors of the pnictides and related families

CR-2:IL01 **Nodal Multigap Superconductivity in the Iron-based Compound RbCa2Fe4As4F2**
D. DAGHERO[1], D. TORSELLO[1,2], E. PIATTI[1], G.A. UMMARINO[1,3], X. YI[4], X. XING[4], Z. SHI[4], G. GHIGO[1,2], [1]Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy; [2]Istituto Nazionale di Fisica Nucleare, Sezione di Torino, Torino, Italy; [3]National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moskva, Russia; [4]School of Physics, Southeast University, Nanjing, China

CR-2:IL02 **Murunskite - Interpolation Compound between Cuprates and Pnictides**
D. TOLJ[1], T. IVŠIĆ[1], I. ŽIVKOVIĆ[1], K. SEMENIUK[1], E. MARTINO[1], A. AKRAP[2], P. REDDY[3], B. KLEBEL-KNOBLOCH[4], I. LONČARIĆ[5], L. FORRÓ[1], N. BARIŠIĆ[4,3], H. RONNOW[1], D.K. SUNKO[3], [1]EPFL, Lausanne, Switzerland; [2]University of Fribourg, Switzerland; [3]University of Zagreb, Croatia; [4]TU Wien, Austria; [5]Rudjer Boskovic Institute, Croatia

CR-2:IL03 **Touching the Ultimate Superconducting Properties of (Ba,K) Fe2As2 Epitaxial Thin Films by Low-angle Grain Boundary Networks**
KAZUMASA IIDA, T. HATANO, Nagoya University, Nagoya, Japan; D. QIN, M. NAITO, A. YAMAMOTO, Tokyo University of Agriculture and Technology, Tokyo, Japan; C. TARANTINI, National High Magnetic Field Laboratory, Florida State University, FL, USA; C. WANG, Z. GUO, H. GAO, H. SAITO, S. HATA, Kyushu University, Fukuoka, Japan

Session CR-3
Properties of superconductors

CR-3:IL01 **Charge-density-waves in a Magnetic Insulating Cuprate**
R. COMIN, Massachusetts Institute of Technology, Cambridge, MA, USA

CR-3:IL02 **Ultrasound Evidence for a Two-component Superconducting Order Parameter in Sr2RuO4**
S. BENHABIB, C. LUPIEN, I. PAUL, L. BERGES, M. DION, M. NARDONE, A. ZITOUNI, Z. Q. MAO, Y. MAENO, A. GEORGES, L. TAILLEFER, C. PROUST, LUMES- EPFL, Lausanne, Switzerland

CR-3:IL03 **Tuning Quantum Phases in Transition Metal Dichalcogenides via Ionic Liquid Gating-induced Protonation**
E. PIATTI, J. MONTAGNA BOZZONE, D. DAGHERO, R.S. GONNELLI, Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy; G. LAMURA, M. MEINERO, Dipartimento di Fisica, Università di Genova, Genova, Italy; S. RODDARO, Istituto Nanoscienze-CNR, NEST and Scuola Normale Superiore, Pisa, Italy; D. DE FAZIO, ICFO-The Institute of Photonic Sciences, Castelldefels, Spain; G. PROFETA, Department of Physical and Chemical Sciences, University of L'Aquila, L'Aquila, Italy; G. PRANDO, P. CARRETTA, Dipartimento di Fisica, Università di Pavia, Pavia, Italy

CR-3:IL04 **MgB2 Superconductors with High Critical Current Densities**
M. MIRYALA[1], S.S. ARVAPALLI[1], M. JIRSA[2], M. MURAKAMI[1], J. NOUDEM[3], [1]Materials for Energy and Environmental Laboratory, Superconducting Materials Group, College of Engineering, Shibaura Institute of Technology, Tokyo, Japan; [2]Institute of Physics ASCR, Praha, CZ; [3]CRISMAT-CNRS, ENSICAEN, Normandy University, Caen, France

CR-3:IL05 **Proximity Induced Superconductivity in Monolayer MoS2**
M. IAVARONE[1], D.J. TRAINER[1], B. WANG[2], F. BOBBA[1,3], N. SAMUELSON[4], X. XI[1], J. ZASADZINNSKI[4], J. NIEMINEN[5], A. BANSIL[2], [1]Physics Department, Temple University, Philadelphia, PA, USA; [2]Physics Department, Northeastern University, Boston, MA, USA; [3]Physics Department, University of Salerno, Fisciano (SA), Italy; [4]Physics Department, Illinois Institute of Technology, Chicago, IL, USA; [5]Computational Physics Laboratory, Tampere University, Tampere, Finland

CR-3:IL06 **Charge Correlations and Charge Fluctuations in Cuprate Superconductors**
W. TABIS, AGH University of Science and Technology in Krakow, Poland & Vienna University of Technology, Austria

CR-3:IL07 **Physical Limitations of the Hohenberg-Mermin-Wagner Argument**
G. PALLE, **D.K. SUNKO**, Department of Physics, Faculty of Science, University of Zagreb, Croatia

CR-3:IL08 **Ultranodal Pair State in FeSe1-xSx Superconductors**
TAKASADA SHIBAUCHI, Department of Advanced Materials Science, University of Tokyo, Kashiwa, Japan

CR-3:IL09 **Application of Metamaterial Nano-engineering for Increasing the Superconducting Critical Temperature**
M.S. OSOFSKY[1], V.N. SMOLYANINOVA[2], J.C. PRESTIGIACOM[1], J.W. LYNN[3], N.P. BUTCH[3], H. CHEN-MAYER[3], P.F. ROSEN[4], J.J. CALVIN[4], B. WOODFIELD[4], I.I. SMOLYANINOV[5], [1]Naval Research Laboratory, Washington, DC, USA; [2]Department of Physics Astronomy and Geosciences, Towson University, Towson, MD, USA; [3]NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, USA; [4]Department of Chemistry and Biochemistry, Brigham Young University, Provo, UT, USA; [5]Department of Electrical and Computer Engineering, University of Maryland, College Park, MD, USA

CR-3:IL10 **High-Tc Cuprates - Story of Two Electronic Subsystems**
N. BARIŠIĆ[1,2], [1]Institute of Solid State Physics, TU Wien, Wien, Austria; [2]Department of Physics, Faculty of Science, University of Zagreb, Zagreb, Croatia

CR-3:L11 **Possibility of Kosterlitz-Thouless in Weakly Coupled Superconducting Systems**
A.K. GHOSH, P. DAS, T. SK, S. HALDAR, Department of Physics, Jadavpur University, Kolkata, India

Session CR-4
Theory mechanisms and vortex lattice physics

CR-4:IL01 **Quantum Criticality and Unconventional Superconductivity in Heavy Fermion Systems**
QIMIAO SI, Rice Center for Quantum Materials, Rice University, Houston, TX, USA

CR-4:IL02 **Room-temperature Superconductivity in Hydrides**
G. PROFETA, University of L'Aquila, L'Aquila, Italy

Session CR-5
Synthesis and processing

CR-5:IL01 **Super-oxidized Phases in Cuprate and Iridate Thin Films**
JOHN WEI, Department of Physics, University of Toronto, Canada

CR-5:IL02 **New Generation of Superconducting Foams and their Applications**
M.R. KOBLISCHKA, A. KOBLISCHKA-VENEVA, Experimental Physics, Saarland University, Saarbrücken, Germany & Shibaura Institute of Technology, Tokyo, Japan

CR-5:IL03 **Superheating Property of REBa2Cu3O7-x Nanofilms and their Thermal Stability Acting as Seeds in the Growth of REBa2Cu3O7-x Superconductors**
XIN YAO, Shanghai Jiao Tong University, Shanghai, China

CR-5:IL04 **Status of Development of REBCO Superconductor Tapes and Wires for High Magnetic Field and Power Applications**
V. SELVAMANICKAM, Department of Mechanical Engineering Advanced Manufacturing Institute Texas Center for Superconductivity University of Houston, Houston, TX, USA

CR-5:IL05 **New Cu-based Density Wave Order in YBa2Cu3O7/Nd1-x(Ca,Sr)xMnO3 Multilayers**
R. GAINA[1, 2], C.W. NICHOLSON[1], M.RUMO[1], S. SARKAR[1], J. KHMALADZE[1], E. PARIS[3], Y. TSENG[3], W. ZHANG[3], T.C. ASMARA[3], D. MCNALLY[3], C. PIAMONTEZE[3], E. WESCHKE[4], T. SCHMITT[3], C. MONNEY[1], **C. BERNHARD**[1], [1]University of Fribourg, Department of Physics and Fribourg Center for Nanomaterials, Fribourg, Switzerland; [2]Laboratory for Neutron Scattering and Imaging, Paul Scherrer Institut, Villigen PSI, Switzerland; [3]Swiss Light Source, Photon Science Division, Paul Scherrer Institut, Villigen PSI, Switzerland; [4]Helmholtz-Zentrum Berlin für Materialen und Energie, BESSY II, Berlin, Germany

CR-5:IL06 **Polaronic High-temperature Superconductivity in Bismuth, Copper, and Iron-based Superconductors**
GUO-MENG ZHAO, Research Institute of Zhejinag University at Taizhou, China

Session CR-6
Applications

CR-6:IL01 **Energy & Material Efficiency: Liquid Hydrogen & HTS - A Perfect Fit**
T. ARNDT, KIT, ITEP, Eggenstein-Leopoldshafen, Germany

CR-6:IL02 **Use of Electromagnetic Potentials for the Modeling of Critical State and AC Losses in Superconducting Wires and Cables**
F. GÖMÖRY, M. SOLOVYOV, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia

Poster Presentations

C:P01 **Silicon Powder Recovery: From End-of-Life Photovoltaic Panels to Si-SiC Composites**
S. GRILLI, E. SALERNITANO, M. SCAFÈ, F. BURGIO, P. FABBRI, G. MAGNANI, ENEA SSPT-PROMAS-TEMAF, Laboratory of Materials Technologies Faenza, Faenza (RA), Italy

C:P02 **The Influence of Sm2O3 Additive on Microstructure and Electromagnetic Properties of Lithium Ferrite Ceramics**
A. SURZHIKOV, E. LYSENKO, V. VLASOV, Tomsk Polytechnic University, Tomsk, Russia

C:P03 **Effect of Zirconia Addition on the Microsrtucture and Electromagnetic properties of LiTiZn Ferrite Ceramics**
E. LYSENKO, A. SURZHIKOV, S. NIKOLAEVA, Tomsk Polytechnic University, Tomsk, Russia

C:P04 **Grain Boundary Mobility of Alumina as a Function of Varying Dopant Concentrations**
Y. SHALABI, R. MARDER, W.D. KAPLAN, Technion- Israel Institute of Technology, Iksal, Israel

C:P05 **The Influence of Anorthite Glass on Grain Boundary Mobility in Alumina**
N. FABRI[1], R. MARDER[1], R. ROVAI[2], W.D. KAPLAN[1], [1]Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa, Israel; [2]Industrie Bitossi S.P.A., Vinci, Italy

C:P06 **Influence of Dispersity, Concentration of Carbon Additive and Mechanical Processing of Composite Powders of Zirconium Dioxide - Carbon on the Compaction of Zirconium Ceramics during Sintering**
I.P. VASIL'EV, A.P. SURZHIKOV, **S.A. GHYNGAZOV**, National Research Tomsk Polytechnic University, Tomsk, Russia

C:P07 **Glass Injection Moulding; Investigation of the Complete Process Chain for a Commercial Glass Powder**
M. ZÜRN, T. HANEMANN, Karlsruhe Institute of Technology, Institute for Applied Materials, Eggenstein - Leopoldshafen, Germany

C:P08 **Densification Modeling for Hot Pressing of SiN**
KYONG JUN AN, D.S. JEON, Korea Institute of Industrial Technology, Gyeonggi-do, South Korea

C:P09 **Green and Sintered Properties of Dry-pressed Alumina using a New Synthesized Copolymer able to act Simultaneously as a Dispersant, Binder and Plasticizer**
I. HAJRI[1], M.R. BEN ROMDHANE[1,3], N. TESSIER-DOYEN[2], E. SRASRA[1], T. CHARTIER[2], [1]Centre National de Recherche en Sciences des Matériaux (CNRSM), laboratoire des matériaux composites et des minéraux argileux, Soliman, Tunisie; [2]Laboratoire IRCER (Institut de recherche sur les céramiques), Limoges, France; [3]Institut supérieur des sciences et technologies de l'environnement de Borj Cedria, Hammam Lif, Tunisie

C:P10 **Inkjet Printing for Additive Manufacturing of Polymer-derived Ceramics based on Polysilazane Coatings for High-temperature Applications**
A. QAZZAZIE-HAUSER[1], K. HONNEF[1], T. HANEMANN[1, 2], [1]Department of Microsystems Engineering, University of Freiburg, Freiburg, Germany; [2]Institute for Applied Materials IAM-WK, Karlsruhe Institute of Technology KIT, Eggenstein-Leopoldhafen, Germany

C:P11 **From Rapid to Flash Microwave Sintering of Zirconia**
C. COUDER, G. RIQUET, T. GARNAULT, C. HARNOIS, S. MARINEL, C. MANIÈRE, Normandie Université, ENSICAEN, UNICAEN, CNRS UMR 6508, CRISMAT, Caen, France

C:P12 **Structurally Well-controlled Metal Nanoparticle/Ceramic Composite as Superior Catalyst for VOC Elimination**
YUNZI XIN[1], T. NAGATA[2], T. SHIRAI[1, 2], [1]Advanced Ceramics Research Center, Nagoya Institute of Technology, Nagoya, Aichi, Japan; [2]Department of Life Science and Applied Chemistry, Graduate School of Engineering, Nagoya Institute of Technology, Nagoya, Aichi, Japan

C:P13 **Hard Alloys with Ultralow-cobalt Content Obtained by Spark Plasma Sintering**
E.A. LANTSEV, V.N. CHUVIL'DEEV, A.V. NOKHRIN, M.S. BOLDIN, Y.V. BLAGOVESHCHENSKII, N.V. ISAEVA, P.V. ANDREEV, K.E. SMETANINA, National Research Lobachevsky State University, Research and Development Institute of Physics and Technology, Nizhny Novgorod, Russia; Baikov Institute of Metallurgy and Materials Science, RAS, Moscow, Russia

C:P14 **Laser Ablation Behavior of B4C-Cf-GNPs Hybride High-temperature Composites Sintered by Spark Plasma Sintering**
P. HVIZDOŠ, V. PUCHÝ, Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia

C:P15 **Cool-SPS: From Classic Ferroelectrics to Transparent Ceramics?**
F. MOLINARI, V. MARY, A. ZUDAS, C. SANZ, A. FARGUES, U-C. CHUNG, M. JOSSE, CNRS, Univ. Bordeaux, Bordeaux INP, ICMCB, UMR 5026, Pessac, France

C:P16 **Vat Photopolymerization 3D Printing of Scaffold Structures Mimetic to Bone using Prepared Bovine Hydroxyapatite**
R. ERBERELI[1], I.L. DE CAMARGO[1, 2], C.A. FORTULAN[1], [1]Department of Mechanical Engineering, School of Engineering of São Carlos, University of São Paulo, São Carlos, SP, Brazil; [2]Federal Institute of Education, Science and Technology of São Paulo, Itaquaquecetuba, SP, Brazil

C:P17 **Fe2+ and Fe3+ Doped Calcium Phosphates for Bone Tissue Engineering**
E. ALSUBHE[1], **N. IQBAL**[1], A.D. ANASTASIOU[4], E.M. RAIF[2], P.V. GIANNOUDIS[3], A. JHA[1], [1]School of Chemical and Process Engineering, University of Leeds, UK; [2]Department of Oral Biology, Leeds Dental School, University of Leeds, UK; [3]Faculty of Medicine and Health, University of Leeds, UK; [4]Department of Chemical Engineering and Analytical Science, University of Manchester, UK

C:P18 **Design and Fabrication of Si3N4-based Functionally Graded Composite Ceramic Materials**
JUN-WEI HUANG, XIAO-AN LV, CHANG-CHUN GE, Institute of Powder Metallurgy and Advanced Ceramics (IPMAC), School of Materials Science and Engineering, University of Science and Technology Beijing (USTB), Beijing, China

C:P19 **Simulation of Heat Transfer on In-Situ Derived Alumina-TiB2 Composites**
E. DASKALAKIS, A. JHA, A. SCOTT, A. HASSANPOUR, School of Chemical and Process Engineering, University of Leeds, Leeds, UK

C:P20 **Kinetic Studies of High Entropy FeNiAlCo and FeNiAlCoCr Alloys Formation at High Heating Rates**
Kh. NAZARETYAN, M. TUMANYAN, A.B. Nalbandyan Institute of Chemical Physics, Yerevan, Armenia; D. MOSKOVSKIKH, A. NEPAPUSHEV, National University of Science and Technology MISIS; S. AYDINYAN, A.B. Nalbandyan Institute of Chemical Physics, Yerevan, Armenia and Tallinn University of Technology, Tallinn, Estonia; S. KHARATYAN, A.B. Nalbandyan Institute of Chemical Physics, Yerevan, Armenia

C:P21 **Formation of Ti2AlNx Max-phase by "Hydride Cycle" and SHS Methods**
A.G. ALEKSANYAN, S.K. DOLUKHANYAN, D.G. MAYILYAN, G.N.MURADYAN, O.P. TER-GALSTYAN, N.L. MNATSAKANYAN, A.B. Nalbandyan Institute of Chemical Physics of NAS of Armenia, Yerevan, Armenia

C:P22 **SHS/RMI Process for the Fabrication of Ti3SiC2/SiC Ceramic Matrix Composites using Non-powder Forms of Titanium Metal as a Reactant**
P. ISTOMIN, A. NADUTKIN, E. ISTOMINA, V. GRASS, Institute of Chemistry, FRC Komi SC UB, Russian Academy of Sciences, Syktyvkar, Russia

C:P23 **Self-propagating High-temperature Synthesis of MAX-phases in Ti-Zr-Al-C System**
N.N. AGHAJANYAN, S.K. DOLUKHANYAN, O.P. TER-GALSTYAN, G.N. MURADYAN, K.V. ASATRYAN, A.B. Nalbandyan Institute of Chemical Physics of Armenian National Academy of Sciences (IChPhNAS RA), Yerevan, Armenia

C:P24 **Synthesis of Nanoscale Antiperovskite Complex Nitrides for Catalytic and Magnetic Applications**
N.H. AMIRKHANYAN, M.K. ZAKARYAN, A.B. HARUTYUNYAN, A.B. Nalbandyan Institute of Chemical Physics, Yerevan, Armenia

C:P25 **Micro/Nano Multiscale Reinforcing Strategies for Composites Toward Extreme High-temperature Applications**
Q. FU[1], **PEI ZHANG**[1], L. ZHUANG[1], L. ZHOU[1], J. ZHANG[1], J. WANG[2], X. HOU[3], R. RIEDEL[1, 4], H. LI[1], [1]State Key Laboratory of Solidification Processing, Shaanxi Key Laboratory of Fiber Reinforced Light Composite Materials, Carbon/Carbon Composites Research Center, Northwestern Polytechnical University, Xi'an, China; [2]School of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai, China; [3]Faculty of Engineering, University of Nottingham, University Park, Nottingham, UK; [4]Institut für Materialwissenschaft, Technische Universität Darmstadt, Darmstadt, Germany

C:P26 **Impurity of ZrB2 Powder by Sol-gel Synergistic Carbon Thermal Reduction Route**
RUIXING LI, School of Materials Science and Engineering, Beihang University, Beijing, China

C:P27 **Carbosilicothermic Synthesis of New MAX Phases in the Zr-Ti-Si-C System**
P. ISTOMIN, E. ISTOMINA, A. NADUTKIN, **V. GRASS**, Institute of Chemistry, FRC Komi SC UB, Russian Academy of Sciences, Syktyvkar, Russia

C:P28 **Towards Increasing the Yield and Enhancing the Quality of In-plane Vacancy Ordered MXenes (Mo1.33CTz and W1.33CTz¬) Obtained from their In-plane Ordered i-MAX Phases (Mo2/3Y1/3)2AlC and (W2/3Y1/3)2AlC**
J. HALIM, J. ROSEN, Material Design Division, Department of Physics, Chemistry and Biology (IFM), Linköping, Linköping University, Linköping, Sweden

C:P29 **Ti3SiC2 MAX Phase Ceramics from Leucoxene (titania-silica) Concentrates**
I. BELYAEV, P. ISTOMIN, E. ISTOMINA, A. NADUTKIN, V. GRASS, Institute of Chemistry, FRC Komi SC UB, Russian Academy of Sciences, Syktyvkar, Russia

C:P30 **Sol-gel Assisted Synthesis of New Carbonitride MAX Phases V2GaC1-xNx and Cr2GaC1-xNx**
N. KUBITZA, Technische Universität Darmstadt, Darmstadt, Germany; C.S. BIRKEL, Arizona State University, Tempe, AZ, USA

C:P31 **Low-temperature Plasma Treatment in Designing the Morphology of Titania Nanofibers**
I. SHEPA, E. MUDRA, M. VOJTKO, O. MILKOVIC, J. DUSZA, Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovak Republic; D. PAVLINAK, Department of Physical Electronics, Masaryk University, Brno, Czechi Republic; P. TATARKO, Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava, Slovak Republic; V. ANTAL, J. BEDNARCIK, Institute of Experimental Physics, Slovak Academy of Sciences, Košice, Slovak Republic

C:P32 **Zinc Oxide Nanorods Photoelectrode Covered with Cuprous Oxide Thin Film for Photoelectrochemical Water Oxidation**
BYEONGGUK MIN, **HYOJIN KIM**, Department of Materials Science and Engineering, Chungnam National University, Daejeon, South Korea

C:P33 **Atomic Scale Platinum Deposition by Photo-illuminated Multiple Redox Cycles on Photocathodes for Enhanced Solar to Hydrogen Energy Conversion**
JI HOON CHOI, DONG SU KIM, SARKER SWAGOTOM, HAK HYEON LEE, HYUNG KOUN CHO, School of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon-si, South Korea

C:P34 **Optimal Al-doped ZnO Overlayers by Atomic Layer Deposition for Charge Transport Enhancement of Cu2O Photocathodes**
HAK HYEON LEE, DONG SU KIM, JI HOON CHOI, HYUNG KOUN CHO, Department of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon, South Korea

C:P35 **Photovoltaic Performance of Inverted Polymer Solar Cells using Semiconductor Quantum-dots Monolayer as Electron Transport Layer**
DONG ICK SON, JAEHYEON LEE, JOO SONG LEE, Institute of Advanced Composite Materials, Korea Institute of Science and Technology (KIST), Jeonbuk, South Korea

C:P36 **Production of Fe2O3/α-Al2O3 Luster Pigments by Wet Chemical Method and their Characterization**
B. GUNHAN, C. WEINEKÖTTER, M. KOK, Kutahya Dumlupinar University, Kutahya, Turkey; H.B. POYRAZ, Eskisehir Technical University, Eskisehir, Turkey; **G. KAYA**, Kutahya Dumlupinar University, Kutahya, Turkey

C:P37 **Influence of Solute and pH of Alkaline Etching Solution on Hierarchical Nanoporous Layer Formation**
MASAHITO SHIMAZAKI, A. NAKAMURA, T. FUJIMA, Department of Mechanical Engineering, Tokyo City University, Tokyo, Japan

C:P38 **The formation of Hierarchical Nanoporous Layer on a Silicate Glass : Effect of Simultaneous Etching of Oxide**
AI NAKAMURA, M. SHIMAZAKI, T. FUJIMA, Department of Mechanical Engineering, Tokyo City University, Tokyo, Japan

C:P39 **Silicon Carbide Thin Films Deposited by HiPIMS on Ti-6Al-4V Substrates to Improve the Adherence for Tribological Applications**
A.C.MERIJ[1], K.G.GRIGOROV[2], G.F.C.ALMEIDA[3], A.A.COUTO[3, 4], A.A. ARBEX[3], A.S. DA SILVA SOBRINHO[5], D.M.G. LEITE[5], C.A.M.OLIVEIRA[3], **M. MASSI**[3], [1]Federal University of São Paulo, ICT/UNIFESP, São José dos Campos / SP, Brazil; [2]Space Research and Technology Institute, Acad. G. Bonchev, Bl.1, Sofia, Sofia, Bulgaria; [3]Mackenzie Presbyterian University, School of Engineering-PPGEMN, São Paulo / SP, Brazil; [4]Nuclear and Energy Research Institute, IPEN/USP, São Paulo / SP, Brazil; [5]Technological Institute of Aeronautics, ITA/DCTA, São José dos Campos / SP, Brazil

C:P40 **Photonic Multilayer Structure for Near-infrared Blocking as Energy-saving Window**
JIWON KIM[1], **SANGWON BAEK**[1], JAE YONG PARK[1], KWANG HO KIM[2], JONG-LAM LEE[1], [1]Department of Materials Science and Engineering, Pohang University of Science and Technology, Pohang, South Korea; [2]Department of Materials Science and Engineering, Pusan National University, Pusan, South Korea

C:P41 **Studies on Structure, Redox Properties and Catalytic Activity of Cu-doped Strontium Titanates obtained from Modified Pechini Method**
A. MIZERA, E. DROZDZ, AGH University of Science and Technology, Kraków, Lesser Poland, Poland

C:P42 **Atenolol Oxidation using Ferrites Photoanodes grown on Ceramic SnO2 doped with Sb**
J. CARRILLO-ABAD, J. MORA-GÓMEZ, **M. GARCÍA-GABALDÓN**, M.T. MONTAÑÉS, S. MESTRE, V. PÉREZ-HERRANZ, IEC Group, Universitat Politècnica de València, València, Spain; Instituto de Tecnología Cerámica, Castelló, Spain

C:P43 **Performance of SnO2 doped with Sb coated with Different Photoactive Materials for the Depletion of Norfloxacin**
C. DOMINGO-TORNER, S. JIMÉNEZ-LOZOYA, J. CARRILLO-ABAD, J. MORA-GÓMEZ, M. GARCÍA-GABALDÓN, M. T. MONTAÑÉS, S. MESTRE, **V. PÉREZ-HERRANZ**, IEC Group, Universitat Politècnica de València, València, Spain; Instituto de Tecnología Cerámica, Castelló, Spain

C:P044 **The Influence of Humidity on Perovskite Niobate Dielectrics**
M. FREY[1], C.K. YANG[1], T. HANEMANN[1,2], [1]University of Freiburg, Department of Microsystems Engineering - Laboratory for Materials Processing, Freiburg, Germany; [2]Karlsruhe Institute of Technology, Institute of Applied Materials, Karlsruhe, Germany

C:P45 **Nanomechanical Probing of Lead-free Ferroelectrics**
K. ZIBERNA[1, 2], A. DRNOVŠEK[3], H. URŠIČ[1, 2], T. ROJAC[1, 2], A. BENČAN[1, 2], [1]Electronic Ceramics Department, Jožef Stefan Institute, Ljubljana, Slovenia; [2]Jožef Stefan International Postgraduate School, Ljubljana, Slovenia; [3]Department of Thin Films and Surfaces, Jožef Stefan Institute, Ljubljana, Slovenia

C:P46 **Ab Initio Study of Sodium Diffusion and Redox Mechanism in Polyanionic Molybdates**
N.I. MEDVEDEVA, A.V. SERDTSEV, D.V. SUETIN, Institute of Solid State Chemistry, Ekaterinburg, Russia

C:P47 **Innovative Sol-gel IV-VI Quantum Dots-doped Thin Films for Temperature Detection Instrumentation**
M. ELISA, S.M. IORDACHE, A-M. IORDACHE, I.C. VASILIU, I. PANA; M. ENCULESCU; C. ELOSUA AGUADO; F.J. ARREGUI, D. LOPEZ; D. ULIERU, X. VILA; J. CARIDAD HERNANÁNDEZ, M.Á. CASANOVA GONZÁLEZ; J.F. DE PAZ SANTANA; O. TOMA, A-M. VOICULESCU, A. ENACHI, National Institute of R & D for Optoelectronics-INOE 2000, Magurele, Jud. Ilfov, Romania; National Institute of Materials Physics, Magurele, Jud. Ilfov, Romania; Public University of Navarre, Pamplona, Navarre, Spain/Institute of Smart Cities (ISC), Public University of Navarre, Pamplona, Navarre, Spain; Public University of Navarre, Pamplona, Navarre, Spain; SITEX 45, Bucharest, Romania; Automation of The Internet of Things SL, AlfaIoT, Salamanca, Castilla y Leon, Spain; University of Salamanca, Salamanca, Castilla y Leon, Spain; National Institute of Lasers Plasma and Radiation Physics, Magurele, Jud. Ilfov, Romania

C:P48 **Anti-counterfeiting Security Inks using Colour Tuneable Rare-earth doped Sol-gel Nano-glass-ceramics for Codification of Luminescent Patterns**
C. HERNÁNDEZ-ÁLVAREZ, S. TORRES-GARCÍA, M. MEDINA-ALAYÓN, P. ACOSTA-MORA, A.C. YANES, J. DEL-CASTILLO, Universidad de La Laguna, La Laguna, Tenerife, Spain; A. MENÉNDEZ-VELÁZQUEZ, Centro IDONIAL, Oviedo, Asturias, Spain; J. MÉNDEZ-RAMOS, Universidad de La Laguna, La Laguna, Tenerife, Spain

C:P49 **Characterization of Twin Boundary Defects and Threading Dislocations by Both TEM and Etch Pit from (-201) beta-Ga2O3**
SOON-KU HONG, Chungnam National University, Daejeon, South Korea

C:P50 **Transparent InGaZnO based TFT Structures for Display Application**
A. SMIRNOV, B. KAZARKIN, A. STEPANOV, Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus

C:P51 **Carrier Transport Effect due to ZnO Layer in Quantum Dot Photodiodes**
S.Y. JEONG, S.K. CHA, J.S. PARK, J.H. KANG, **IL KI HAN**, Nanophotonics Research Center, Korea Institute of Science and Technology, Seoul, South Korea; J.H. KYHM, Quantum-functional Semiconductor Research Center, Dongguk University, Seoul, South Korea; S.J. KANG, Department of Advanced Materials Engineering Information and Electronics, Kyunghee University, Yongin, South Korea

C:P52 **High Performance P-Type Thin-film Transistor with Atomic-Layer-deposited SnO Channel Layer**
MYEONG GIL CHAE[1], BO KEUN PARK[2], TAKE-MO CHUNG[2], **JEONG HWAN HAN**[1], [1]Department of Materials Science and Engineering, Seoul National University of Science and Technology, Seoul, South Korea; [2]Division of Advanced Materials, Korea Research Institute of Chemical Technology, South Korea

C:P53 **High Performance β-Ga2O3 Solar-blind Photodetector grown by Plasma-assisted Pulsed Laser Deposition**
WONCHAE JEONG, TAEYOUNG KIM, YOONSOK KIM, **EUN KYU KIM**, Department of Physics, Hanyang University, Seoul, South Korea

C:P54 **Films of Conductive Oxides to Hydrogen Sulphide Detection in Air**
S.A. KRUTOVERTSEV, A.V. PISLYAKOV, L.S. KRUTOVERTSEVA, O.M. IVANOVA, JSC "Ecological sensors and systems", Zelenograd, Moscow, Russia

C:P55 **The Drava River Sediments as Precursors in the Production of Alkali Activated Materials (AAMs)**
K. TRAVEN, B. HORVAT, Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia; **M. BOŽIČ**, B. GREGORC, Dravske elektrarne Maribor, Maribor, Slovenia; V. DUCMAN, Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia

C:P56 **Alkali-activation of Fly-ash with Microwaves**
B. HORVAT, M. PAVLIN, V. DUCMAN, ZAG, Ljubljana, Slovenia

C:P57 **Reuse of Waste Glass Wool generated in the Process of Demolition and Restoration of Buildings for the Production of Artificial Lightweight Aggregates**
J.M MORENO-MAROTO, A.B LÓPEZ GARCÍA, S. LEÓN-GUTIERREZ, M.T. COTES-PALOMINO, C. COBO-CEACERO, M. UCEDA-RODRÍGUEZ, **C. MARTÍNEZ-GARCÍA**, Department of Chemical, Environmental and Materials Engineering, Higher Polytechnic School of Linares, University of Jaén, Linares (Jaén), Spain

C:P58 **Firing Transformations of Dredged Sediment used in the Manufacturing of Ceramic Bricks**
L. MESRAR[1], A. BENAMAR[1], R. JABRANE[2], [1]LOMC, University Le Harve Normandie, CNRS, France; [2]LGE, University Sidi Mohammed Ben Abdellah, Fez, Morocco

C:P59 **Study of Nepheline Crystallisation from Thermal Transformation of Zeolites**
M. ROMERO, I. PADILLA, A. LÓPEZ-DELGADO, Eduardo Torroja Institute of Construction Science, IETcc-CSIC, Madrid, Spain

C:P60 **Development and Study of MgO-C Refractories containing Al2O3 and/or TiO2 Nanoparticles**
S. GKIOUZEL[1], K.C. VASILOPOULOS[1], I. KITSOU[2], E. ROUSSI[2], E. KAGIARAS[3], A. TSETSEKOU[2], S. AGATHOPOULOS[1], **M.A. KARAKASSIDES**[1], [1]Department of Materials Science and Engineering, University of Ioannina, Ioannina, Greece; [2]School of Mining Engineering and Metallurgy, National Technical University of Athens, Athens, Greece; [3]Mathios Refractories S.A., Athens, Greece

C:P61 **C/SiC Core-shell Composite Fibers as a Source of Matrix Material in the Fabrication of Carbon fiber-reinforced Ceramic Matrix Composites**
E. ISTOMINA, P. ISTOMIN, A. NADUTKIN, V. GRASS, Institute of Chemistry, FRC Komi SC UB Russian Academy of Sciences, Syktyvkar, Russia

C:P62 **Influence of Different Micro-fiber Types on Tensile Behavior of Carbon Textile-reinforced Cementitious Composite**
KYOUNG-KYU CHOI, Soongsil University, Seoul, South Korea

C:P63 **MgB2 doped with Ge-polymer Additions and using SPS Technique**
D. BATALU, University POLITEHNICA of Bucharest, Bucharest, Romania; T. NAKAMURA, Asai Germanium Research Institute Co., Kawasaki, Kanagawa, Japan; N. CRETU, A.BEZERGHEANU, Transilvania University of Brasov, Brasov, Romania; G. ALDICA, M. BURDUSEL, M. GRIGOROSCUTA, S. POPA, I. PASUK, L. MIU, P. BADICA, National Institute of Materials Physics, Magurele, Romania

FORUM COMMITTEES

Chair

Pietro Vincenzini
National Research Council

Co-Chair

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

Advisory Boards

SYMPOSIUM FA - 3D Printing and Beyond: State-of-the-art and New Paradigms for Additive Manufacturing Technologies

Convener: Amit Bandyopadhyay, *USA* *Members:* Vamsi K. Balla, *India* Christophe Chaput, *France* Marco Domingos, *UK* Dongdong Gu, *China* John W. Halloran, *USA* Soshu Kirihara, *Japan* Yong Lin Kong, *USA* Christian Leinenbach, *Switzerland* Ming Leu, *USA* Gideon N. Levy, *Switzerland* Xiaochun Li, *USA* Fue Wen Liou, *USA* Tassilo Moritz, *Germany* Tobias Schaedler, *USA* Martin Schaefer, *Germany* Manfred Schmid, *Switzerland* Dileep Singh, *USA* Christopher M. Spadaccini, *USA* Albert Tarancon, *Spain* Nahum Travitzky, *Germany* Lorenzo Valdevit, *USA* Michael Zaeh, *Germany* Lijuan Zhang, *China*

SYMPOSIUM FB - Flexible and Stretchable Electronics: Materials, Devices and Applications

Conveners: Michele Muccini, *Italy* John A. Rogers, *USA* W. Hong Yeo, *USA* *Members:* Tricia Breen Carmichael, *Canada* Vladimir Dyakonov, *Germany* Guglielmo Fortunato, *Italy* Martin Heeney, *UK* Yonggang Huang, *USA* Olle Inganas, *Sweden* Jae-Woong Jeong, *South Korea* Martin Kaltenbrunner, *Austria* Dae-Hyeong Kim, *South Korea* Taek-Soo Kim, *South Korea* Virgilio Mattoli, *Italy* Ivan Minev, *Germany* Michele Muccini, *Italy* Christian Mueller, *Sweden* Arokia Nathan, *UK* Yong-Young Noh, *South Korea* Tsuyoshi Sekitani, *Japan* Xing Sheng, *China* Manos M. Tentzeris, *USA* Shizuo Tokito, *Japan* Luisa Torsi, *Italy* Junliang Yang, *China* Yang Yang, *USA*

SYMPOSIUM FC - Research Advances on Micro/Nano Systems and their Applications

Convener: Leandro Lorenzelli, *Italy* *Members:* Farrokh Ayazi, *USA* Joan Bausells, *Spain* Juergen Brugger, *Switzerland* Chang Beom Eom, *USA* Elvira Fortunato, *Portugal* Hiroshi Funakubo, *Japan* Christofer Hierold, *Switzerland* Andrew Holmes, *UK* James C.M. Hwang, *USA* Bernhard Jakoby, *Austria* Sang-Gook Kim, *USA* Chengkuo Lee, *Singapore* Wen Jung Li, *Hong Kong* Marc J. Madou, *USA* Sabina Merlo, *Italy* Yves-Alain Peter, *Canada* Jose-Luis Sanchez-Rojas, *Spain* Pietro Siciliano, *Italy* Osamu Tabata, *Japan* Haixia Zhang, *China*

SYMPOSIUM FD - Recent Achievements in Multiferroic and Magnetoelectric Materials

Convener: Gopalan Srinivasan, *USA* *Members:* Christian Binek, *USA* Ying-Hao Chu, *Taiwan* Josè Maria De Teresa, *Spain* Judith Driscoll, *UK* Atsushi Fujimori, *Japan* Tsuyoshi Kimura, *Japan* Neil D. Mathur, *UK* Yukitoshi Motome, *Japan* Alexandr Nosov, *Russia* Masanori Okuyama, *Japan* Natalia Poddubnaya, *Russia* Andreas Ruediger, *Canada* Jacobo Santamaria, *Spain* Susanne Stemmer, *USA* Evgeny Y. Tsymbal, *USA* Dwight Viehland, *USA* Melvin M. Vopson, *UK* Yonggang Zhao, *China*

SYMPOSIUM FE - Functional Nanomaterials for New Generation Solid State Chemical Sensors

Convener: Giovanni Neri, *Italy* *Members:* Chris Blackman, *UK* Salvatore Iannotta, *Italy* Ho Won Jang, *South Korea* Kourosh Kalantar-Zadeh, *Australia* Andrei Kolmakov, *USA* Jae-Joon Lee, *South Korea* Peter Alexander Lieberzeit, *Austria* Eduard Llobet, *Spain* Alessandro Martucci, *Italy* Stanislav A. Moshkalev, *Brazil* Luca Ottaviano, *Italy* Zafer Ziya Ozturk, *Turkey* Nicola Pinna, *Germany* Gustavo Rivas, *Argentina* Chinnathambi Sekar, *India* Youichi Shimizu, *Japan* Michael Tiemann, *Germany* Alfred Tok, *Singapore* Dimitris Tsoukalas, *Greece*

SYMPOSIUM FF - Electromagnetic Metamaterials and Metasurfaces: Recent Research Achievements and New Paradigms

Convener: Yuri S. Kivshar, *Australia* *Members:* Andrea Alu, *USA* Pavel Belov, *Russia* Tie Jun Cui, *China* Maria Kafesaki, *Greece* Eugene O. Kamenetskii, *Israel* Mikhail Lapine, *Australia* Andrei Lavrinenko, *Denmark* Guixin Li, *China* Masaya Notomi, *Japan* Willie John Padilla, *USA* Concita Sibilia, *Italy* Isabelle Staude, *Germany* Takuo Tanaka, *Japan* Sergei A. Tretyakov, *Finland* Din Ping Tsai, *Taiwan* Lei Zhou, *China*

FORUMC COMMITTEES

SYMPOSIUM FG - Advances in Inorganic Luminescent Materials

Convener: Giancarlo C. Righini, *Italy* *Members:* Marco Bettinelli, *Italy* Jean-Claude Bünzli, *Switzerland* Luis Carlos, *Portugal* Loic J. Charbonniere, *France* Xueyuan Chen, *China* Volkmar Dierolf, *USA* Guoping Dong, *China* Pieter Dorenbos, *Netherlands* Philippe Goldner, *France* H.T. (Bert) Hintzen, *Netherlands* Thomas Juestel, *Germany* Rosa Maria Montereali, *Italy* Shyue Ping Ong, *USA* Dirk Poelman, *Belgium* Federico Rosei, *Canada* Lauren Shea-Rohwer, *USA* Kiyoshi Shimamura, *Japan* Setsuhisa Tanabe, *Japan* Kenji Toda, *Japan* Xiao-Jun Wang, *USA*

FH - *4th International Conference* "Emerging Materials, Technologies and Applications for Non-volatile Memory and Memristive Devices"

Co-Chairs: Gennadi Bersuker, *USA* Hideo Ohno, *Japan* Sabina Spiga, *Italy (Convener)* Rainer Waser, *Germany* *Members:* Marco Bernasconi, *Italy* Stefano Brivio, *Italy* Regina Dittmann, *Germany* Alexei Gruverman, *USA* Tuo-Hung Hou, *Taiwan* Antony Kenyon, *UK* Alexander V. Kolobov, *Russia* Michael Kozicki, *USA* Blanka Magyari-Köpe, *USA* Thomas Mikolajick, *Germany* Pierre Noè, *France* Stuart Parkin, *Germany* Kin-Leong Pey, *Singapore* Dafinè Ravelosona, *France* Yakov Roizin, *Israel* Abu Sebastian, *Switzerland* Eisuke Tokumitsu, *Japan* Ilia Valov, *Germany* Christian Wenger, *Germany* Huaqiang Wu, *China* Qiangfei Xia, *USA* Eilam Yalon, *Israel* Andrei Zenkevich, *Russia*

SYMPOSIUM FI - Graphene and Other Emerging 2D-layered Nanomaterials: Synthesis, Properties and Potential Applications

Conveners: Yury Gogotsi, *USA* Valeria Nicolosi, *Ireland* *Members:* Maya Bar Sadan, *Israel* Cinzia Casiraghi, *UK* Chun-Wei Chen, *Taiwan* Manish Chhowalla, *UK* Toshiaki Enoki, *Japan* Klaus Ensslin, *Switzerland* Andrea C. Ferrari, *UK* Joshua Goldberger, *USA* Karsten Horn, *Germany* Antti-Pekka Jauho, *Denmark* Sang Ouk Kim, *South Korea* Zhongfan Liu, *China* Taiichi Otsuji, *Japan* Marcos Pimenta, *Brazil* Stephan Roche, *Spain* Takayoshi Sasaki, *Japan* Mauricio Terrones, *USA* Alla Zak, *Israel*

SYMPOSIUM FJ - Advanced Photocatalytic Materials for Energy and Chemistry in Transition and for the Environment

Conveners: Gabriele Centi, *Italy (Programme Chair)* Siglinda Perathoner, *Italy* *Members:* Detlef Bahnemann, *Germany* Radim Beranek, *Germany* Zhong Chen, *Singapore* Zhengxiao Guo, *Hong Kong* Ladislav Kavan, *Czech Rep.* Christel Laberty-Robert, *France* Wojciech Macyk, *Poland* Guido Mul, *Netherlands* Michael Nolan, *Ireland* Bunsho Ohtani, *Japan* David Ollis, *USA* Leonardo Palmisano, *Italy* Hyunwoong Park, *South Korea* Krishnan Rajeshwar, *USA* Gregory S. Rohrer, *USA* Dunwei Wang, *USA* Jinlong Yang, *China*

SYMPOSIUM FK - Thermoelectrics: Materials Research and Application Technologies

Convener: Jean-Pierre Fleurial, *USA* *Members:* Gang Chen, *USA* Lidong Chen, *China* Xavier Crispin, *Sweden* Frank Gascoin, *France* Juri Grin, *Germany* Bo B. Iversen, *Denmark* Woochul Kim, *South Korea* Holger Kleinke, *Canada* Jan König, *Germany* Bertrand Lenoir, *France* Chia-Jyi Liu, *Taiwan* Ole M. Lovvik, *Norway* Antoine Maignan, *France* Marisol Martin Gonzalez, *Spain* Yuzuru Miyazaki, *Japan* Takao Mori, *Japan* Dario Narducci, *Italy* George S. Nolas, *USA* Sascha Populoh, *Switzerland* Anthony Powell, *UK* Ichiro Terasaki, *Japan* Janusz Tobola, *Poland* Daniele Maria Trucchi, *Italy* Jeff Urban, *USA* Tiejun Zhu, *China*

SYMPOSIUM FL - Stimuli Responsive and Multifunctional Polymers: Progress in Materials and Applications

Convener: Andreas Lendlein, *Germany* *Members:* Guillermo Ameer, *USA* Leif Asp, *Sweden* Ray Baughman, *USA* Walter Caseri, *Switzerland* Ryan Hayward, *USA* James H. Henderson, *USA* Jinlian Hu, *Hong Kong* Jennifer Lu, *USA* Duncan J. Maitland, *USA* Eduardo Mendes, *Netherlands* Phillip B. Messersmith, *USA* Philippe Poulin, *France* Hans-Joachim Radusch, *Germany* Gianfranco Spizzirri, *Italy* Nicola Tirelli, *Italy* Marek W. Urban, *USA* Julius G. Vancso, *Netherlands* Tao Xie, *China* Ryo Yoshida, *Japan*

SYMPOSIUM FM - State-of-the-art Research and Applications of Shape Memory Alloys

Conveners: Franca Albertini, *Italy (Programme Chair)* Manfred Kohl, *Germany* Peter Mullner, *USA* *Members:* Ferdinando Auricchio, *Italy* Vasiliy D. Buchelnikov, *Russia* Francesca Casoli, *Italy* Eduard Cesari, *Spain* Volodymyr A. Chernenko, *Spain* Sebastian Faehler, *Germany* Markus E. Gruner, *Germany* Oliver Gutfleisch, *Germany* Simo-Pekka Hannula, *Finland* Oleg Heczko, *Czech Republic* Wei Min Huang, *Singapore* Yoichi Kishi, *Japan* Yasukazu Murakami, *Japan* Antoni Planes, *Spain* Xiaobing Ren, *Japan/China* Lara Righi, *Italy* Avadh B. Saxena, *USA* Petr Sittner, *Czech Republic* Minoru Taya, *USA* Rie Umetsu, *Japan* Elena Villa, *Italy*

SYMPOSIUM FN - Smart and Interactive Textiles - From Nano-engineered Textile Fibres to Integrated Wearable Systems

Convener: George K. Stylios, *UK* *Members:* Steve Beeby, *UK* Cosimo Carfagna, *Italy* Esma Ismailova, *France* Toshihiro Itoh, *Japan* Jess Jur, *USA* Fatma Kalaoglu, *Turkey* Byung Hoon Kim, *South Korea* Vladan Koncar, *France* Tong Lin, *Australia* Uwe Moehring, *Germany* Nils-Krister Persson, *Sweden* Jan Vanfleteren, *Belgium* Zhong Lin Wang, *USA* Kai Yang, *UK*

FORUMC COMMITTEES

SYMPOSIUM FO - Embodying Intelligence in Structures and Integrated Systems

Co-Chairs: Ray Baughman, *USA* Fabio Casciati, *Italy (Convener)* Akira Nishitani, *Japan* André Preumont, *Belgium* *Members:* Alexander Belyaev, *Russia* Ayech Benjeddou, *France* Sara Casciati, *Italy* Zhicong Chen, *China* Christis Chrysostomou, *Cyprus* Sascha Duczek, *Australia* Lucia Faravelli, *Italy* Daniel J. Inman, *USA* Hans Irschik, *Austria* Lukasz Jankowski, *Poland* Hyung-Jo Jung, *South Korea* Anne S. Kiremidjian, *USA* Agnessa Kovaleva, *Russia* Michael Krommer, *Austria* B.L. (Les) Lee, *USA* Ying Lei, *China* Yaozhi Luo, *China* Sami Masri, *USA* Akira Mita, *Japan* Satish Nagarajaiah, *USA* Yi Qing Ni, *Hong Kong* Costas Papadimitriou, *Greece* Francesc Pozo, *Spain* José Rodellar Benede, *Spain* Emanuela Speranzini, *Italy* David Wagg, *UK* Lijun Wu, *China* Yong Xia, *Hong Kong* Xiao-Wei Ye, *China* Songye Zhu, *Hong Kong*

SYMPOSIUM FP - Biological, Biohybrid and Bioinspired Materials: From Electronics and Photonics to Medicine

Convener: Gianluca Farinola, *Italy* *Members:* Maria A. Capozzi, *Italy* Luisa De Cola, *France* Jesus Martinez De La Fuente, *Spain* Malte C. Gather, *UK* Hendrik Hölscher, *Germany* Yasuhiro Ishida, *Japan* Mathias Kolle, *USA* Guglielmo Lanzani, *Italy* Raul J. Martin Palma, *Spain* Nicola Martino, *USA* Christian B. Nielsen, *UK* Sedat Nizamoglu, *Turkey* Alessandro Pezzella, *Italy* Maurizio Prato, *Italy* Angela Punzi, *Italy* Roberta Ragni, *Italy* Akira Saito, *Japan* Yury Shchipunov, *Russia* Daniel Simon, *Sweden* Eleni Stavrinidou, *Sweden* Natalie Stingelin, *USA & UK* Claudia Tortiglione, *Italy* Massimo Trotta, *Italy* Silvia Vignolini, *UK*

FQ - *13th International Conference* "Advanced Biomaterials and Nano-biotechnology for Medicine"

Conveners: Aldo Boccaccini, *Germany* Esmaiel Jabbari, *USA (Programme Chair)* Min Wang, *Hong Kong* *Members:* Serena Best, *UK* Marc Bohner, *Switzerland* Guoping Chen, *Japan* Peilin Chen, *Taiwan* Yakai Feng, *China* John Fisher, *USA* Changyou Gao, *China* Mingyuan Gao, *China* Masakazu Kawashita, *Japan* Sergei Kulkov, *Russia* Cato Laurencin, *USA* Doo Sung Lee, *South Korea* Jin Ho Lee, *South Korea* Pavel A. Levkin, *Germany* Jun Li, *Singapore* Patrick T. Mather, *USA* Ji Ho (Joe) Park, *South Korea* Pier Paolo Pompa, *Italy* Kurosch Rezwan, *Germany* Yasuhiko Tabata, *Japan* Maryam Tabrizian, *Canada* Vladimir P. Torchilin, *USA* Yuhuang Wang, *USA* Thomas J. Webster, *USA* Younan Xia, *USA* Nobuhiko Yui, *Japan* Lijie Grace Zhang, *USA*

Focused Session FQ-6 - Next Generation Implantable Neural Interfaces

Convener: Stefano Vassanelli, *Italy* *Members:* Fabio Biscarini, *Italy* Andreas Demosthenous, *UK* Dominique Durand, *USA* Dario Farina, UK Andreas Hierlemann, *Switzerland* Nigel Lovell, *Australia* Kip Ludwig, *USA* Luca Maiolo, *Italy* George G. Malliaras, *UK* Jun Ohta, *Japan* Christelle Prinz, *Sweden*

Focused Session FQ-7 - Wireless Body Sensor Networks for Healthcare Applications

Convener: Lorenzo Mucchi, *Italy* *Members:* Maria Teresa Arredondo W., *Spain* Matti Hamalainen, *Finland* Bin He, *USA* Robert Istepanian, *UK* Roozbeh Jafari, *USA* Benny Ping Lai Lo, *UK* Joel Rodrigues, *Portugal & Brazil* Mohamad Sawan, *China* Alessandro Tognetti, *Italy* Peter Veltink, *Netherlands* Guang-Zhong Yang, *UK* Mehmet R. Yuce, *Australia*

Focused Session FQ-8 - 3D Bioprinting of Soft Tissues and Organs

Convener: Giovanni Vozzi, *Italy* *Members:* Jason A. Burdick, *USA* Shaochen Chen, *USA* David Correa, *Canada* Kenneth Dalgarno, *UK* Bin Duan, *USA* Dietmar W. Hutmacher, *Australia* Leonid Ionov, *Germany* Ali Khademhosseini, *USA* Lorenzo Moroni, *Netherlands* Roger Narayan, *USA* Ibrahim Ozbolat, *USA* Wojciech Swieszkowski, *Poland* Shoufeng Yang, *Belgium* Amir A. Zadpoor, *Netherlands* Y. Shrike Zhang, *USA*

FR - *4th International Conference* "Materials Challenges for Sustainable Nuclear Fission and Fusion Technologies"

Conveners: Guo-Jun Zhang, *China* *Members:* Massimo Angiolini, *Italy* Vladimir Barabash, *France* Viacheslav Chernov, *Russia* Xavier Deschanels, *France* Sergei Dudarev, *UK* Gianfranco Federici, *Germany* Takeshi Hirai, *Japan* Qunying Huang, *China* Changheui Jang, *South Korea* Yutai Katoh, *USA* Weon-Ju Kim, *South Korea* Richard Kurtz, *USA* Hua-Tay Lin, *China* Christian Linsmeier, *Germany* Bing Liu, *China* Tong Liu, *China* Igor Mazul, *Russia* Takeo Muroga, *Japan* Yasuyoshi Nagai, *Japan* Marek Rubel, *Sweden* Lance Snead, *USA* Dmitry Terentyev, *Belgium* Jason Trelewicz, *USA* Thierry Wiss, *Germany* Yican Wu, *China* Michio Yamawaki, *Japan*

Focused Session FR-10 - Materials Issues in Radioactive Nuclear Waste Treatment and Disposal

Convener: Nadia Cherubini, *Italy* *Members:* Dirk Bosbach, *Germany* Kyle S. Brinkman, *USA* Jordi Bruno, *Spain* Rodney C. Ewing, *USA* Brady Hanson, *USA* Neil C. Hyatt, *UK* Diederik Jacques, *Belgium* Jie Lian, *USA* Sylvain Peuget, *France* Vincenzo Rondinella, *Germany* Hojin Ryu, *South Korea* Weiqun Shi, *China* Blas Uberuaga, *USA* Elie Valcke, *Belgium* Yuezhou Wei, *China*

Outline Forum

Symposium FA
3D Printing and Beyond: State-of-the-art and New Paradigms for Additive Manufacturing Technologies

Symposium FB
Flexible and Stretchable Electronics: Materials, Devices and Applications

Symposium FC
Research Advances on Micro/Nano Systems and their Applications

Symposium FD
Recent Achievements in Multiferroic and Magnetoelectric Materials

Symposium FE
Functional Nanomaterials for New Generation Solid State Chemical Sensors

Symposium FF
Electromagnetic Metamaterials and Metasurfaces: Recent Research Achievements and New Paradigms

Symposium FG
Advances in Inorganic Luminescent Materials

FH
4th International Conference
Emerging Materials, Technologies and Applications for Non-volatile Memory Devices

Symposium FI
Graphene and Other Emerging 2D-layered Nanomaterials: Synthesis, Properties and Potential Applications

Symposium FJ
Advanced Photocatalytic Materials for Energy and Chemistry in Transition and for the Environment

Symposium FK
Thermoelectrics: Materials Research and Application Technologies

Symposium FL
Stimuli Responsive and Multifunctional Polymers: Progress in Materials and Applications

Symposium FM
State-of-the-art Research and Applications of Shape Memory Alloys

Symposium FN
Smart and Interactive Textiles - From Nano-engineered Textile Fibres to Integrated Wearable Systems

Symposium FO
Embodying Intelligence in Structures and Integrated Systems

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

FQ
13th International Conference
Advanced Biomaterials and Nano-biotechnology for Medicine

Focused Session ***FQ-6***
Next Generation Implantable Neural Interfaces

Focused Session ***FQ-7***
Wireless Body Sensor Networks for Healthcare Applications

Focused Session ***FA-5/FQ-6***
3D Bioprinting of Soft Tissues and Organs

FR
4th International Conference
Materials Challenges for Sustainable Nuclear Fission and Fusion Technologies

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

Sessions Timetable

9th Forum on New Materials - June 25-29, 2022

Saturday June 25

15.00-19.00
REGISTRATION
Centro Congressi Hotel Quattrotorri
Via Corcianese, 260
Perugia, Italy

Sunday June 26

Morning: 9.30-13.00

Opening Session
Welcome Addresses
Plenary Lectures (F:PL1-PL3)

Afternoon: 14.30-19.00

Symposium FA	(FA-1:IL01 to IL04) (FA-5/FQ-8:IL01 to IL04)
Symposium FB	(FB-1:IL01 to IL03) (FB-1:IL04 to L06)
Symposium FC	(FC:KL1 to KL3) (FC-2:IL01 to IL02)
Symposium FD	(FD-1:IL01 to L03) (FD-1:IL04 to L06)
Symposium FF	(FF-1:IL01 to IL03) (FF-2:IL01 to IL02)
Symposium FG	(FG-1:IL01 to IL03) (FG-1:IL04 to IL06)
Conference FH	(FH-3:IL01 to L05) (FH-3:IL06 to L11)
Symposium FI	(FI-1:IL01 to IL03) (FI-1:IL04 to IL06)
Symposium FJ	(FJ-1:IL01 to IL03) (FJ-1:IL04 to L07)
Symposium FK	(FK-1:IL01 to IL03) (FK-1:IL04 to IL05)
Symposium FL	(FL-1:IL01 to IL02) (FL-1:IL03 to L05)
Symposium FM	(FM-1:IL01 to IL03) (FM-1:L04 to L06)
Symposium FN	(FN-2:KL+IL01) (FN-2:IL02 to IL03)
Symposium FO	(FO-5)
Symposium FP	(FP-1:IL01 to IL02) (FP-1:IL03 to L05)
Conference FQ	(FQ:KL+FQ-1:IL01 to IL03) (FQ-1:IL04 to L08)
Conference FR	(FR:KL+FR-2:IL01) (FR-2:IL02 to L04)

14.30-18.30
POSTER MOUNTING

20.30-22.00
Welcome Party

Monday June 27

Morning: 9.00-13.00

Symposium FA	(FA-1:IL05 to IL08) (FA-5/FQ-8:IL05 to L08)
Symposium FB	(FB-1:IL07 to L10) (FB-1:IL11 to L13)
Symposium FC	(FC-1:IL01 to IL03) (FC-1:IL04 to IL06)
Symposium FD	(FD-2:IL01 to L03) (FD-2:IL04 to L06)
Symposium FF	(FF-1:L04 to IL05) (FF-2:IL03 to L05)
Symposium FG	(FG-1:IL07 to L09) (FG-1:IL10 to L12)
Conference FH	(FH-1.1:IL01 to L08) (FH-1.1:IL09 to L14)
Symposium FI	(FI-2:IL01 to L03) (FI-2:IL04 to L06)
Symposium FJ	(FJ-2:IL01 to IL03) (FJ-2:IL04 to IL06)
Symposium FK	(FK-1:IL06 to L09) (FK-1:IL10 to IL12)
Symposium FL	(FL-2:IL01 to IL02) (FL-3:IL01 to L03) (FL-6:IL01)
Symposium FM	(FM-1:IL07 to IL09) (FM-1:IL10 to IL12)
Symposium FN	(FN-1:IL01 to L04) (FN-2:IL04 to IL05)
Symposium FO	(FO-5)
Symposium FP	(FP-1:IL06 to L07) (FP-2:IL01 to IL04)
Conference FQ	(FQ-1:IL09 to IL12) (FQ-2:IL01 to IL04)
Conference FR	(FR-1:IL01 to IL03) (FR-3:IL01 to IL03) (FR-10.1:IL01 to IL03) (FR-10.1:IL04 to IL06)

Afternoon: 14.30-19.00

Symposium FA	(FA-5/FQ-8:IL09 to L13) (FA-5/FQ-8:IL14 to IL17)
Symposium FB	(FB-1:IL14 to L17) (FB-2:L01 to L03)
Symposium FC	(FC-2:IL03 to IL05) (FC-3:IL01 to L02)
Symposium FD	(FD-3:IL01 to L03) (FD-3:IL04 to L06)
Symposium FE	(FE-1:IL01 to L04) (FE-2:IL01 to IL02)
Symposium FF	(FF-2:IL06 to L08) (FF-3:IL01 to IL03)
Symposium FG	(FG-2:IL01 to L04) (FG-1:L13 to L15)
Conference FH	(FH-2:IL01 to IL05) (FH-2:IL06 to L12)
Symposium FI	(FI-1:IL07 to L09) (FI-2:IL07 to L09)
Symposium FJ	(FJ-2:IL07 to IL09) (FJ-3:IL01 to L02)
Symposium FK	(FK-1:IL13 to IL15) (FK-1:IL16 to L19)
Symposium FL	(FL-3:IL04 to IL05) (FL-4:IL01 to IL03)
Symposium FM	(FM-1:L13 to L16) (FM-1:L17 to L20)
Symposium FN	(FN-2:IL06 to IL07) (FN-2:IL08 to IL09)
Symposium FO	(FO-5)
Symposium FP	(FP-2:IL05 to IL07) (FP-2:IL08 to IL09)
Conference FQ	(FQ-1:IL13 to L16) (FQ-2:IL05 to IL07)
Conference FR	(FR-1:L04 to L06) (FR-4:IL01 to IL04) (FR-10.1:IL07 to L11) (FR-10.2:IL01 to IL02)

Tuesday June 28

Morning: 9.00-13.00

Symposium FA	(FA-1:IL09 to IL15) (FA-2:IL01 to IL02)
Symposium FB	(FB-3:IL01 to L03) (FB-3:IL04 to L06)
Symposium FC	(FC-3:IL03 to L04) (FC-4:IL01 to IL03)
Symposium FD	(FD-3:IL07 to IL09) (FD-3:IL10 to IL11)
Symposium FE	(FE-2:IL03 to IL05) (FE-3:IL01 to IL03)
Symposium FF	(FF-4:IL01 to IL03) (FF-4:IL04 to IL05)
Symposium FG	(FG-3:IL01 to IL03) (FG-4:IL01 to IL02)
Conference FH	(FH-3:IL12 to L17) (FH-3:IL18 to L24)
Symposium FI	(FI-3:IL01 to L03) (FI-3:IL04 to L06)
Symposium FJ	(FJ-3:IL03 to L04) (FJ-3:L05 to L07)
Symposium FK	(FK-1:IL20 to IL22) (FK-1:IL23 to IL25)
Symposium FL	(FL-4:IL04 to L06) (FL-5:IL01 to IL03)
Symposium FM	(FM-1:IL21 to L23) (FM-1:IL24 to L25)
Symposium FN	(FN-3:IL01 to L04) (FN-2:IL10 to IL11)
Symposium FO	(FO-1:IL01 to L04) (FO-1:IL05 to IL07)
Symposium FP	(FP-2:IL10 to IL11) (FP-3:IL01 to L04)
Conference FQ	(FQ-3:IL01 to L05) (FQ-4:IL01 to L02) (FQ-5:IL01 to IL02)
Conference FR	(FR-3:IL04 to IL06) (FR-5:IL01 to L04) (FR-10.2:IL03 to L06) (FR-10.3:IL01 to IL03)

Afternoon: 14.30-19.00

Symposium FA	(FA-2:IL03 to L07) (FA-2:IL08 to L11)
Symposium FE	(FE-2:IL06 to L09) (FE-5:IL01 to L04)
Symposium FF	(FF-5:IL01 to IL03) (FF-5:IL04 to IL05)
Symposium FG	(FG-4:IL03 to L05) (FG-5:IL01 to IL02)
Conference FH	(FH-1.2:IL01 to L05) (FH-1.2:IL06 to L12)
Symposium FI	(FI-3:IL07 to L08) (FI-4:IL01 to IL04)
Symposium FJ	(FJ-2:IL10 to IL11) (FJ-2:IL12 to IL13)
Symposium FK	(FK-1:IL26 to IL28) (FK-2:IL01 to IL03)
Symposium FL	(FL-5:IL04 to IL05) (FL-6:IL02 to IL04)
Symposium FM	(FM-2:IL01 to IL02) (FM-2:IL03 to L06)
Symposium FN	(FN-3:IL05 to IL06) (FN-3:IL07 to IL08)
Symposium FO	(FO-2:IL01 to IL05) (FO-3:L01 to L03)
Symposium FP	(FP-3:IL05 to IL07) (FP-3:IL08 to IL09)
Conference FQ	(FQ-6:IL01 to IL04) (FQ-6:IL05 to IL07)
Conference FR	(FR-6:IL01 to L06) (FR-6:IL07 to L12) (FR-10.3:IL04 to IL06)

Wednesday June 29

Morning: 9.00-13.00

Symposium FA	(FA-2:IL12 to L17) (FA-3:IL01 to L03)
Symposium FB	(FB-3:IL07 to IL09) (FB-3:IL10 to IL11)
Symposium FD	(FD-4:IL01 to IL03) (FD-4:IL04 to L07)
Symposium FE	(FE-4:IL01 to IL03) (FE-5:IL05 to IL08)
Symposium FF	(FF-5:IL06 to IL08) (FF-6:IL01 to IL02)
Symposium FG	(FG-6:IL01 to L03) (FG-6:IL04 to L05)
Conference FH	(FH-1.2:IL13 to L17) (FH-3:IL25 to L31)
Symposium FI	(FI-6:IL01 to L04) (FI-6:IL05 to L08)
Symposium FK	(FK-2:IL04 to IL06) (FK-3:IL01 to L03)
Symposium FL	(FL-7:IL01 to L03) (FL-7:IL04 to IL06)
Symposium FM	(FM-3:IL01 to L03) (FM-3:L04 to L06)
Symposium FO	(FO-3:IL04 to L07) (FO-4:IL01 to IL02)
Symposium FP	(FP-4:IL01 to L03) (FP-4:IL04 to IL06)
Conference FQ	(FQ-3:L06 to L07) (FQ-7:IL01 to IL03) (FQ-7:IL04 to IL06)
Conference FR	(FR-6:IL13 to IL14) (FR-7:IL01 to L06) (FR-10.4:IL01 to L03) (FR-10.4:IL04 to IL05)

Afternoon: 14.30-18.30

Symposium FA	(FA-3:IL04 to IL05) (FA-4:IL01 to L02)
Symposium FB	(FB-3:IL12 to IL14)
Symposium FD	(FD-4:IL08 to IL10)
Symposium FF	(FF-6:IL03 to IL05)
Symposium FG	(FG-7:IL01 to IL04)
Conference FH	(FH-1.2:IL18 to L23)
Symposium FI	(FI-5:IL01 to IL04)
Symposium FK	(FK-3:IL04 to IL06)
Symposium FM	(FM-3:IL07 to IL09)
Symposium FO	(FO-4:L03 to IL07)
Conference FQ	(FQ-7:IL07 to IL09)
Conference FR	(FR-8:IL01 to IL04)

16.30-18.30
POSTER DISCUSSION

20.30-23.00
Closure Dinner

Code Number of contributions by Presenting Author
(in alphabetical order)

The Code Number XY-W:Z00 includes: XY Symposium; W Session; Z Type of presentation (PL, KL, IL, L, P)*; 00 Paper number

* PL Plenary KL Keynote Lecture IL Invited Lecture L Contributed Lecture P Poster presentation

NOTE: Due to the restructuring of some symposia, the session number included in the Code may differ from the one selected by the Presenting Author in the Abstract Submission Form.

Abdou Mohamed	FR-8:IL01	Ben Zineb Tarak	FM-3:IL01	Causse Jeremy	FG-4:L05
Abidian Mohammad Reza	FQ-6:IL01	Benfenati Valentina	FQ-6:IL02	Cecchini Raimondo	FH-1.1:L06
Accardo Angelo	FL-6:IL01	Berhault Gilles	FJ-3:L02	Cendula Peter	FJ-2:IL06
Acet Mehmet	FM-2:IL01	Bersuker Gennadi	FH-1.2:IL02	Centini Marco	FF-1:IL05
Adejube Blessing	F:P17	Bertacco Riccardo	FH-3:L05	Cesari Eduard	F:P24
Adenwalla Shireen	FD-3:IL05	Besland Marie-Paule	FH-3:IL12	Cesini Ilaria	FB-1:L06
Aguirre Fernando	FH-1.2;IL01	Bettini Paolo	FM-3:IL07	Chang Fu-Kuo	FO-5
Aiello Giacomo	FR-2:IL01	Bhaskaran Harish	FC-1:IL04	Chang Honglong	FC-4:IL02
Alff Lambert	FH-1.2:IL06	Bhatnagar Akash	FD-2:IL05	Chang Jiang	FQ-2:IL02
Alfieri Maria Laura	FP-1:L05	Bhattacharya Arun	FR-6:IL07	Chang Wen-Hao	FI-2:IL01
Alonso Julio	FI-5:IL01	Bhattacharya Shalleyee	FR-5:L03	Chaput Christophe	FA-1:IL08
Ameer Guillermo	FL-5:IL01	Bibes Manuel	FD-2:IL04	Chaput Laurent	FK-1:IL03
Amouyal Yaron	FK-1:IL22	Blackburn Lewis	FR-10.1:IL02	Chekol Solomon Amsalu	FH-3:L22
Anasori Babak	FI-3:IL04	Blackman Chris	FE-2:IL01	Chen Aiping	FD-2:IL01
Anderson Patrick	FA-2:IL03	Bloh Jonathan Z.	FJ-2:IL03	Chen Biqiong	FL-2:IL02
Andronic Luminita	FJ-1:L07	Blugan Gurdial	FQ-7:IL01	Chen Guoping	FQ-2:IL06
Angiolini Massimo Emilio	FR-1:L05	Bobnar Vid	FD-2:L03	Chen Li-Chyong	FI-2:IL07
Angioni Damiano	FQ-1:L14	Boccaccini Aldo R.	FQ-1:IL01	Chen Lidong	FK-1:IL15
Antognazza Maria Rosa	FQ-6:IL07	Bodner Sabine	FA-2:L07	Chen Xiang (Frank)	FR-6:IL08
Antolini Francesco	FG-2:IL02	Boghossian Ardemis	FP-2:IL07	Chen Yong	F:PL2
Arakawa Kazuto	FR-6:IL14	Bonadies Irene	FN-3:IL05	Chen Zhangwei	FA-1:IL11
Araya-Hermosilla Esteban	FL-4:L06	Bortoluzzi Daniele	FO-4:L03	Chernov Viacheslav	FR-6:IL02
Arenal Raul	FI-5:IL04	Bosbach Dirk	FR-10.3:IL06	Chevalier Jerome	FA-1:IL04
Arisaka Yoshinori	FQ-1:IL10	Bose Susmita	FA-1:IL09	Chiba Seiki	FB-3:L06
Ariza Tarazona Maria C.	FJ-3:L04	Bourell David	FA-4:IL01	Chizhik Alexander	FC-3:L02
Ascoli Alon	FH-3:L10	Bourges Cedric	FK-1:IL20	Choi Kyoung-Kyu	F:P26
Assoudi Nadia	FD-1:L06	Bovino Fabio Antonio	FF-5:IL02	Choi Seon-Jin	FE-1:IL02
Babicheva Viktoriia	FF-3:IL02	Brailovski Vladimir	FA-2:L11	Choi Seung-Ho	FE-5:L04
Babkina Anastasiia	FG-1:L13	Brik Mikhail	FG-1:IL11	Chrisey Doug	FA-5/FQ-8:IL14
Backe Carin	FN-3:L04	Brinkman Kyle S.	FR-10.1:IL04	Chrysostomou Christis	FO-4:IL01
Bae Chang-Jun	FA-1:IL12	Brivio Stefano	FH-3:L27	Chung In	FK-1:IL17
Baek Sangwon	FF-1:L04	Buchelnikov Vasiliy	FM-1:L13	Churakova Anna	FM-1:L25
Bailey Daniel	FR-10.1:IL07	Buzio Renato	FI-6:L02	Cicoira Fabio	FP-2:IL08
Baillard Adrien	FJ-3:L05	Cai Xingke	FI-4:IL04	Ciupinski Lukasz	F:P34
Baino Francesco	FQ-4:IL01	Caillat Thierry	FK-3:IL04	Claypole Tim	FN-3:IL07
Balke Benjamin	FK-1:IL08	Caironi Mario	FB-3:IL01	Cocca Mariacristina	FN-3:IL01
Balogh Zoltan	FH-1.2:L17	Çakir Asli	FH-2:L04	Coenen Jan Willem	FR-8:IL02
Bandyopadhyay Amit	FA-2:IL01	Calarco Raffaella	FH-1.1:L14	Colak Gamze	FR-10.2:L06
Bar Sadan Maya	FI-2:L03	Calzolari Arrigo	FH-1.1:L05	Coletti Camilla	FI-4:IL02
Barabash Vladimir	FR-4:IL02	Camilli Luca	FI-3:IL07	Comoretto Davide	FP-3:IL06
Bardet Laetitia	FB-1:L10	Campoy-Quiles Mariano	FK-1:IL24	Convertino Annalisa	FQ-6:IL03
Barg Suelen	FA-3:IL05	Candolfi Christophe	FK-1:IL25	Coppi Chiara	FD-1:L03
Barillaro Giuseppe	FC:KL-3	Cannillo Valeria	FQ-1:L07	Corinto Fernando	FH-3:L08
Barral Thomas	FR-10.1:L11	Capobianco John A.	FG-3:IL02	Costantini Marco	FA-5/FQ-8:IL06
Basu Bikramjit	FA-1:IL15	Capriotti Luca	FR-5:IL01	Coulais Corentin	FF-6:IL04
Baughman Ray	FO-5	Caps Valérie	FJ-3:L06	Craciun Monica	FQ-7:IL03
Baur Florian	FG-2:IL03	Carlos Luis	FG-7:IL01	Cunha Costa Miranda G.	FR-5:L04
Baur Jeffery	FO-5	Carlotti Marco	FA-3:L03	Curri Lucia	FC-2:IL01
Bausa Luisa	FG-1:IL05	Carstens Niko	FH-3:L20	D'Andrea Cosimo	FP-3:IL02
Baysal Hasan Emre	FB-1:L09	Casciati Sara	FO-1:IL05	Da Fonseca Daphné	FR-6:L06
Beeby Stephen	FN-2:IL10	Casilari Eduardo	F:P30	Daeneke Torben	FE-3:IL02
Bellucci Alessandro	FK-3:IL05	Casoli Francesca	FM-2:IL02	Dahiya Ravinder	FC:KL-2
Belyaev Sergey	F:P22	Cau Dit Coumes Céline	FR-10.1:IL05	Dalton Alan	FN-2:IL07

D'Arienzo Massimiliano FJ-2:IL10
De Angelis Costantino FF-5:IL05
De Camaret Clement FH-1.1:L12
De Camargo Andrea S.S. FG-7:IL04
De Lotto Roberto FO-4:IL02
De Maria Carmelo FA-5/FQ-8:IL04
De Santis Jessica FI-3:L08
Delaney Colm FP-3:L04
Delente Jason FA-2:L05
Delgado Teresa FG-2:L04
Delgado Notario Juan A. FI-4:IL03
Delmonte Davide FD-1:IL01
Demidov Dmitry FR-6:L04
Demkov Alex FD-4:L06
Denzer Ralf FB-2:L02
Derby Brian FA-5/FQ-8:IL15
Deschanels Xavier FR-10.4:IL05
Di Falco Andrea FF-4:IL05
Di Francesco Fabio FQ-7:IL02
Dickerson Matthew FA-1:IL06
Dimoulas Athanasios FH-2:L09
D'Isanto Fabiana FK-1:L09
Dittmann Regina FH-1.2:IL15
Dmitriyeva Anna F:P14
Doerr Kathrin FD-2:IL02
Domingos Marco FA-5/FQ-8:IL16
Donate-Buendia Carlos FA-2:IL04
Dong Kai FN-2:IL08
Dorow-Gerspach Daniel FR-3:IL05
Dozzi Maria Vittoria FJ-2:IL07
Dresvyanina Elena F:P28
Dudarev Sergei FR-1:IL02
Durand Dominique FQ-6:IL06
Dutta Mrinmoy FH-3:L23
Dzekan Daniel FM-3:IL08
Eliaz Noam FA-2:IL15
Ennis Alexa FA-3:L02
Enrichi Francesco FG-1:IL02
Escudero Lopez Manuel FH-3:L09
Evlyukhin Andrey FF-3:IL03
Fabbrici Simone FM-1:IL10
Falko Vladimir FI-2:IL05
Faravelli Lucia FO-2:IL02
Fare' Silvia FQ-2:IL03
Febvre Pascal FI-2:IL08
Felbacq Didier FF-5:IL07
Feng Xinliang FI-1:IL05
Fina Ignasi FH-2:IL06
Finkeldei Sarah FR-10.4:IL04
Fiori Gianluca FI-6:IL06
Fliegans Lionel FB-1:L16
Florea Larisa FL-7:L03
Fornari Marco FK-1:IL01
Friedrich Holger FA-1:IL05
Frisenda Riccardo FI-2:IL04
Frolov Timofey FR-7:IL01
Fu Chenguang FK-1:IL06
Fukami Shunsuke FH-3:IL03
Fukuda Kenjiro FB-3:IL11
Galdi Vincenzo FF-2:IL02
Galutskiy Valeriy F:P10
Ganesh Vishnu F:P32
Gao Changyou FQ-2:IL07
Gao Jie FR-6:L03
Garcia-Anton Jose F:P19
Gather Malte C. FP-3:IL01
Gebeshuber IIle C. FP-4:L03
Gelinsky Michael FA-5/FQ-8:IL09
Genovesi Simone FQ-7:IL09
Gentile Gennaro FN-2:IL02
Gerbi Andrea FI-6:L04
Germane Liva F:P20
Ghidini Massimo FD-3:IL02
Ghosh Somnath FO-5
Gilbert Mark FR-2:IL02
Gogotsi Yury FI-2:L09
Golberg Dmitry FI-1:IL03
Gonzalez-Velo Yago FH-1.2:IL21
Gordienko Yuriy F:P36
Gottlieb Oded FO-1:IL01
Gottschall Tino FM-1:IL22
Grabec Tomas FM-1:L16
Granberg Fredric FR-6:L05
Grancini Giulia FB-1:IL03
Grattieri Matteo FP-2:IL09
Gregg Daniel FR-10.2:IL04
Griffini Gianmarco FL-4:IL02
Gruner Markus E. FM-1:IL03
Gruverman Alexei FH-2:IL08
Güntner Andreas FE-2:IL06
Guo Chunlei FK-2:IL05
Gupta Rohit F:P16
Gutfleisch Oliver FM-1:IL01
Haase Markus FG-3:IL01
Haim Simon-Emmanuel F:P05
Hajj Muhammad FO-1:IL06
Halbritter Andras FH-3:L30
Haluska Miroslav FC-2:IL04
Hamid Mehdi FA-2:L16
Haukka Matti FB-1:IL07
Hautecouverture Anna FR-5:L02
Hayward Ryan FL-4:IL01
He Ximin FL-7:IL01
Hebert Sylvie FK-1:IL21
Heczko Oleg FM-1:IL08
Heine Thomas FI-1:IL02
Heinola Kalle FR-3:IL02
Hemadi Myriana FP-4:IL02
Hemmer Eva FG-4:IL02
Henderson James H. FL-6:IL04
Herrera Diez Liza FH-2:IL01
Hofmann Jan Philipp FJ-2:IL01
Hollerman William A. FG-5:IL01
Hõlscher Hendrik FP-1:IL06
Holtz Pia FI-6:L03
Hong Seungpyo FQ-3:IL02
Hu Xiao FF-5:IL03
Huang Guoliang FO-5
Hughes-Riley Theodore FN-2:IL01
Humar Matjaž FB-3:IL10
Humer Alexander FO-1:L03
Hwang Dong Gyu FA-5/FQ-8:L08
Iandolo Donata FP-4:IL06
Iida Tsutomu FK-2:IL03
Ingebrandt Sven FB-3:IL13
Ingrosso Chiara FI-6:IL05
Inman Daniel FO-5
Ionescu Rodica Elena FE-4:IL03
Ismailova Esma FN-2:IL05
Iversen Bo B. FK-1:IL04
Jabbari Esmaiel FQ-2:IL01
Jang Jinah FA-5/FQ-8:IL17
Jang Jinsung FR-1:L04
Jank Michael FQ-7:IL07
Jaque Daniel FG-7:IL03
Jaziri Nesrine FK-3:L03
Jeong Jae-Woong FQ-7:IL06
Jo Yeonggwon FA-5/FQ-8:L07
Joos Jonas FG-1:IL08
Joseph Joel FM-3:L04
Jozwik Bartosz F:P02
Jur Jesse FB-3:IL08
Jüstel Thomas FG-2:IL01
Kafadaryan Yevgenia F:P09
Kaiser Nico FH-1.2:L08
Kamperman Marleen FL-3:IL05
Kang Bin FG-4:IL04
Kang Hong Seok FI-2:L06
Kanno Isaku FC-4:IL03
Kanno Tsutomu FK-1:IL12
Karaman Ibrahim FM-1:IL02
Kareem Ahsan FO-3:IL05
Karg Siegfried F. FH-3:IL13
Kargul Joanna FP-2:IL05
Karpinsky Dmitry FD-2:L06
Kasada Ryuta FR-3:IL03
Katoh Yutai FR-1:IL01
Kaur Damandeep FQ-3:L07
Keckes Jozef FA-2:L06
Keller Nicolas FJ-1:IL02
Kenyon Anthony FH-1.2:IL14
Keplinger Christoph FL-7:IL04
Khuu Khanh FH-3:L15
Kiazadeh Asal FH-1.2:L16
Kikuchi Masanori FQ-1:IL13
Kim Myung-Gil FB-1:L15
Kim Myungji FA-5/FQ-8:L13
Kim Sang-Woo FN-1:IL03
Kim Sunghwan FP-2:IL04
Kim Tae-il FB-3:IL07
Kim Woochul FK-2:IL06
Kim Yong FN-3:IL02
Kimura Kenta FD-3:IL08
Kinloch Ian FI-2:IL02
Kiremidjian Anne S. FO-2:IL01
Kirihara Soshu FA-1:IL01
Kisailus David FO-5
Koizumi Yuichiro FA-2:IL09
Kolle Mathias FP-4:IL04
Kolobov Alexander V. FH-1.1:IL01
Komarov Victor FM-1:L20
Kong Yong Lin FA-3:IL04
Konopatsky Anton FQ-1:L15

Koo Chong Min	FI-1:IL06
Koroleva Aleksandra	F:P13
Kovaleva Agnessa	FO-2:IL03
Kovalevsky Andrei V.	FK-1:IL14
Kovnir Kirill	FK-1:IL27
Kowalska Ewa	FJ-2:IL13
Kozicki Michael	FH-1.2:IL19
Kozielski Kristen	FQ-6:IL04
Kozyukhin Sergey	FH-1.1:L08
Krijnen Gijs	FQ-7:IL05
Krol Konrad	F:P01
Krommer Michael	FO-1:IL02
Kuckling Dirk	FL-3:IL04
Kudva Jay	FO-5
Kumar Amritesh	FD-4:L07
Kumar Vinay	FG-6:L05
Kumi-Barimah Eric	FG-1:L09
Kutlesa Kevin	FA-2:L17
Kuwano Hiroki	FC-3:IL03
Kuznetsov Arseniy	FF-4:IL03
Laberty-Robert Christel	FJ-1:IL04
Laborie Leo	FH-3:L14
Lafarge Valentin	FB-2:L01
Lang Maik	FR-10.3:IL01
Langenberg Eric	FD-3:IL10
Lanzani Guglielmo	F:PL1
Lapine Mikhail	FF-1:IL01
Laurencin Cato	FQ-5:IL01
Lavanya Nehru	FE-5:IL06
Lavrinenko Andrei	FF-2:IL01
Le Gallo Manuel	FH-1.1:IL09
LeBlanc Saniya	FK-3:IL01
Lee B.L. (Les)	FO-5
Lee Jin Ho	FQ-2:IL04
Lee Joon-Seok	FE-1:L04
Lei Ying	FO-4:IL07
Leinders Gregory	FR-10.2:IL01
Lendlein Andreas	FL-1:IL03
Lenoir Bertrand	FK-2:IL04
Lentink David	FO-5
Li Guixin	FF-4:IL01
Li Jun	FQ-3:IL03
Li Zhenyu	FJ-3:IL01
Lian Jie	FR-10.1:L10
Linkenheil Anna	FH-1.2:L03
Lisenkov Sergey	FD-4:L05
Litchinitser Natalia M.	FF-5:IL01
Liu Nannan	FQ-1:L08
Liu Nian	FN-2:IL06
Livraghi Stefano	FJ-2:IL12
Llobet Eduard	FE-5:IL05
Loh Ken	FN-3:L03
Loidl Alois	FD-3:IL11
Longo Massimo	FH-1.1:L03
Lu Jennifer	FL-5:IL04
Luciani Giuseppina	FP-4:IL05
Lukatskaya Maria	FI-6:IL01
Lünser Klara	FM-2:IL03
Maas Michael	FQ-1:IL04
Maccaferri Nicolò	FF-6:IL03
Mach Tim	FB-1:L17
Magdassi Shlomo	FB-1:IL02
Maier Stefan	FF-6:IL01
Maijenburg Wouter	FJ-1:IL03
Maiolo Luca	FQ-6:IL05
Majd Sheereen	FQ-1:IL05
Majumder Mainak	FI-5:IL03
Makarov Denys	FD-3:IL01
Makarova Vladlena	F:P37
Manosa Lluís	FM-1:IL21
Maqsood Muhammad F.	FI-6:L08
Marcelli Romolo	FC-4:IL01
Marcu Aurelian	F:P04
Margolin Ilya	FH-2:L10
Marian Jaime	FR-7:IL03
Marinella Matthew	FH-3:IL26
Martinez Dosal Jorge	FA-1:L14
Martins Rodrigo	FC-1:IL03
Martsenyuk Vadim	F:P21
Maslovski Stanislav I.	FF-2:IL06
Massetti Chiara	FI-1:L07
Mather Patrick T.	FQ-1:IL11
Mattevi Cecilia	FI-4:IL01
Mattoli Virgilio	FC-3:L04
Maudet Florian	FH-1.2:L20
Mayer Matthew T.	FJ-1:IL01
Mazzotta Arianna	FB-1:L13
Mehraban Shahin	FR-1:L06
Mehraeen Shayan	FN-1:L04
Meli Antonino	F:P31
Melis Claudio	FK-1:IL02
Mennecart Thierry	FR-10.3:IL02
Menzel Stephan	FH-3:IL25
Mesa Camilo A.	FJ-2:IL09
Meslin Estelle	FR-6:L12
Messersmith Phillip B.	FL-4:IL04
Meuret Youri	FG-6:IL01
Meyners Dirk	FD-4:IL10
Milano Francesco	FP-2:IL03
Milano Gianluca	FH-3:L19
Mir Anamul Haq	FR-10.3:IL05
Miranda Bruno	FC-5:L02
Miro Sandrine	FR-10.3:IL03
Mishchenko Artem	FI-1:IL04
Mokwa Wilfried	FQ-7:IL08
Molle Alessandro	FI-3:IL01
Molnar Daniel	FH-3:L11
Monroe Mary Beth	FL-5:IL03
Monti Stefano	FR:KL
Moradi Farshad	FH-3:IL02
Morata Alex	FK-1:IL26
Moreels Iwan	FG-3:IL03
Moritz Tassilo	FA-2:IL02
Moroni Lorenzo	FA-5/FQ-8:IL02
Moros Caballero Maria	FP-1:IL02
Munzenrieder Niko	FN-2:IL11
Murakami Yasukazu	FM-1:IL15
Nagarajaiah Satish	FO-3:IL04
Nagasaka Takuya	FR-2:IL03
Nakashima Seiji	FD-1:IL02
Nakayama Koichi	FA-5/FQ-8:IL05
Nam Tae-hyun	FM-1:L06
Narayan Roger	FA-5/FQ-8:IL01
Nasriddinov Abulkosim	FE-5:L03
Nawrocki Robert	FB-3:IL02
Nazarov Andrei	FR-7:L05
Neumeier Stefan	FR-10.4:IL02
Nguyen Thuc-Quyen	FB-1:IL12
Ni Yi Qing	FO-4:IL05
Nie Yuefeng	FD-4:IL04
Nielsen Christian B.	FP-1:IL04
Nierstrasz Vincent	FN-3:IL06
Niewiadomska Justyna	FI-1:L09
Nishitani Akira	FO-4:IL04
Nizamoglu Sedat	FP-4:IL01
Noe Pierre	FH-1.1:IL10
Nogami Masanobu	FR-10.1:IL08
Noheda Beatriz	FH-2:IL07
Numata Shiyu	FH-2:L11
Nyary Anna	FH-3:L24
Oates William	FL-7:L02
Ohshima Kazuaki	FH-2:L12
Ohta Hiromichi	FK-2:IL01
Ohya Yuichi	FL-5:IL05
Okamoto Yoshihiko	FK-1:IL16
Okuzaki Hidenori	FL-4:IL03
Omenetto Fiorenzo	FP-1:IL01
Ong Shyue Ping	FG-1:IL01
Orlandi Fabio	FM-1:IL14
Orlovskiy Yury	FG-1:L15
Ostrikov Kostya (Ken)	FC:KL-1
Ostrowski Mariusz	FO-3:L01
Otsuji Taiichi	FF-6:IL02
Ottaviano Luca	FE-3:IL01
Ottomaniello Andrea	FF-2:L05
Pagounis Emmanouel	FM-1:IL09
Pandini Stefano	FL-1:L04
Paolucci Valentina	FE-3:IL03
Parent Matthieu	FO-1:L04
Park Hong-Gyu	FF-6:IL05
Park Hyunwoong	FJ-3:IL03
Parrino Francesco	FJ-2:IL02
Paternò Giuseppe	FP-3:IL08
Paterson Jessy	FH-1.1:L11
Patzke Greta	FG-6:IL04
Paz Yaron	FJ-2:IL11
Pei Qibing	FB-1:IL01
Peiner Erwin	FC-1:IL01
Perez-Bosch Quesada E.	FH-3:L17
Persson Nils-Krister	FN-1:IL01
Pertsch Thomas	FF-2:IL04
Petti Luisa	FB-3:IL09
Pey Kin-Leong	FH-2:IL03
Pezzella Alessandro	FP-2:IL11
Pham Minh-Son	FA-2:IL13
Piccinelli Fabio	FG-4:IL03
Pinna Nicola	FE-1:IL01
Pint Bruce A.	FR-6:IL09
Pinto Da Silva Luís	FG-5:IL02
Piros Eszter	FH-1.2:L07
Plesse Cedric	FL-1:IL02
Poddubnaya Natalia	FD-4:IL08
Poddubny Alexander N.	FF-5:IL08

Polini Alessandro	FA-5/FQ-8:IL10
Ponkratov Yuriy	F:P33
Poplawski Blazej	FO-3:L02
Posa Laszlo	FH-1.2:L05
Poulesquen Arnaud	FR-10.1:IL01
Poulin Philippe	FL-4:IL05
Prejbeanu Lucian	FH-2:IL02
Pryds Nini	FK-3:IL06
Pyun Jae Chul	FE-5:IL08
Raeis-Hosseini Niloufar	FH-3:L31
Ragni Roberta	FP-1:IL03
Rais-Zadeh Mina	FC-1:IL05
Rajendra Kumar R.T.	FE-5:IL01
Ramos-Barrado José	F:P06
Ramuz Marc	FB-3:IL12
Regev Amir	FH-1.2:IL13
Ren Xiaobing	FM-1:IL07
Resnina Natalia	FM-1:L19
Rey Cyrielle	FR-10-2:L05
Rezwan Kurosch	FQ-1:IL09
Rho Junsuk	FF-3:IL01
Ricciardi Carlo	FH-3:IL18
Ricco Raffaele	FP-1:L07
Righi Riva Flavia	FH-1.1:L04
Riminucci Alberto	FH-3:IL04
Rinaldi Christian	FH-2:IL05
Rinaldi Matteo	FC-3:IL01
Rivnay Jonathan	FB-1:IL04
Robertson Sara	FN-1:IL02
Roche Alison	FR-10.1:L09
Rodionova Valeria	FD-3:IL09
Rodriguez Fano Michael	F:P12
Rosenberger Matthew R.	FI-1:IL01
Rubel Marek	FR-4:IL01
Rumyantseva Marina	FE-2:IL04
Saddow Stephen E.	FC-2:IL02
Saffar Shamshirgar Ali	FF-2:L07
Safranski David	FL-1:L05
Salak Andrei	FD-1:IL05
Samal Sneha	FM-1:L18
Samarkhanov Kuanysh	F:P35
Samusev Anton	FF-5:IL04
Sánchez María José	FH-1.2:L11
Sanchez Velasquez Camilo	FB-1:L08
Sannomiya Takumi	FF-1:IL03
Santa Botond	FH-1.2:L12
Santamaria Jacobo	FD-3:IL04
Santoro Francesca	FP-2:IL01
Scalet Giulia	FA-3:IL01
Schmidt Oliver	FB-3:IL05
Schöning Michael J.	FE-4:IL02
Schwierz Frank	FH-1.2:L04
Scott Timothy F.	FA-2:IL08
Sedlak Petr	FM-1:IL12
Segantin Stefano	FR-7:L04
Seiner Hanus	FM-1:IL05
Seita Matteo	FA-2:IL10
Sekar Chinnathambi	FE-4:IL01
Selli Elena	FJ-2:IL04
Sergeev Grigoriy	F:P38
Serpe Michael J.	FL-2:IL01
Sharma Shruti	FB-2:L03
Shchipunov Yury	FP-3:IL03
Shi Weiqun	FR-10.1:IL06
Shimamura Kiyoshi	FG-1:IL10
Shimanoe Kengo	FE-2:IL02
Shimizu Yasuhiro	FE-2:IL03
Shin Byungha	FJ-3:L07
Shin Sunmi	FB-3:IL14
Short Michael	FR-1:IL03
Shuck Christopher	FI-3:L06
Shvartsman Vladimir	FD-3:IL07
Sibirev Aleksei	FM-3:L06
Silibin Maxim	F:P08
Singaravelu Chandra-M.	FG-1:L14
Singh Mahendra P.	FO-3:IL06
Sinitskii Alexander	FE-1:IL03
Sivak Aleksandr	FR-6:L11
Slesazeck Stefan	FH-3:IL01
Smeacetto Federico	FK-1:L18
Smirnov Aliaksandr	F:P11
Snead Lance	FR-4:IL04
Sokolovskiy Vladimir	FM-1:IL24
Solomon Constantin	FM-3:L03
Sort Jordi	FD-1:IL04
Sort-Montenegro Annael	FL-3:L02
Sottos Nancy	FO-5
Speck Thomas	FL-7:IL06
Speranzini Emanuela	FO-3:L03
Spratte Tobias	FL-3:L03
Sprouster David	FR-6:IL01
Srinivasan Gopalan	FD-4:IL01
Starikov Sergei	FR-7:L06
Stavrinidou Eleni	FP-2:IL02
Steckl Andrew	FQ-3:IL04
Stingelin Natalie	FP-3:IL05
Strukov Dmitri	FH-3:IL06
Studart André R.	FA-1:IL02
Stylios George K.	FN-2:IL04
Suh Dongseok	FN-2:IL09
Suta Markus	FG-1:IL04
Šutka Andris	FJ-2:IL05
Suzudo Tomoaki	FR-7:IL02
Svenskaya Yulia	FQ-3:L05
Sylvestre Alain	FB-3:L03
Tagandurdyeva Nurjemal	F:P29
Takahashi Youtarou	FD-4:IL03
Takai Madoka	FC-2:IL03
Takei Kuniharu	FL-7:IL05
Takhsha Milad	FM-2:L04
Tamura Shinji	FE-2:IL08
Tanabe Setsuhisa	FG-4:IL01
Tanaka Takuo	FF-4:IL04
Tang Ben Zhong	F:PL3
Tanigawa Hisashi	FR-3:IL06
Tao Xiaoming	FN-2:KL
Tarancon Albert	FA-1:IL03
Tassa Oriana	FR-2:L04
Tence Quentin	FR-6:L10
Tenne Reshef	FI-3:IL05
Terebenec Damien	FH-1.1:L02
Thygesen Kristian S.	FI-5:IL02
Tian Yuan	FK-3:L02
Tiemann Michael	FE-2:L09
Tirelli Nicola	FL-5:IL02
Toda Kenji	FG-1:IL03
Tognetti Alessandro	FQ-7:IL04
Tomelleri Martina	FH-1.1:L13
Tondu Bertrand	F:P25
Torah Russel	FN-2:IL03
Torchilin Vladimir P.	FQ-3:IL01
Török Timea Nora	FH-1.2:L23
Torrisi Felice	FB-1:IL11
Tortiglione Claudia	FP-2:IL10
Toufik El Mehdi	FQ-1:L06
Toury Bérangère	FI-3:L03
Tramontano Chiara	FQ-1:L16
Tran Thi Ngoc Lam	FG-1:IL06
Tratnjek Toni	FR-10.4:L03
Trelewicz Jason	FR-3:IL04
Tricinci Omar	FA-4:L02
Tricoli Antonio	FE-2:IL05
Trotta Massimo	FP-2:IL06
Troughton Joseph	FB-1:L05
Trucchi Daniele Maria	FF-2:L08
Tsakmakidis Kosmas	FF-2:IL03
Tseng Yu-Chih	FK-2:IL02
Tsoukalas Dimitris	FE-5:IL07
Turshatov Andrey	FG-1:L12
Tusek Jaka	FM-3:IL09
Ueda Hiroki	FD-4:IL02
Ulaganathan Rajesh Kumar	FI-6:L07
Undisz Andreas	FM-3:IL02
Urban Jeffrey	FK-1:IL23
Urban Marek W.	FL-1:IL01
Vaccaro Francesco	FH-3:L28
Vahl Alexander	FH-3:L21
Valdevit Lorenzo	FA-2:IL14
Valev Ventsislav K.	FF-1:IL02
Van De Burgt Yoeri	FB-3:IL04
Van Sark Wilfried	FG-6:L02
Van Vlierberghe Sandra	FL-6:IL03
Vancso Julius G.	FL-3:IL01
Vaqueiro Paz	FK-1:IL10
Veljovic Djordje	FQ-1:IL03
Verhagen Ewold	FF-5:IL06
Vetrone Fiorenzo	FG-7:IL02
Vignolini Silvia	FP-3:IL07
Vila Rafael	FR-4:IL03
Villa Elena	FM-1:L23
Villa Francesca	FM-3:L05
Vogel Tobias	FH-1.2:L22
Volkov Aleksandr	FO-2:IL05
Volodina Natalia	F:P15
Von Krshiwoblozki Malte	FN-3:IL08
Von Müller Alexander	FR-3:IL01
Vozzi Giovanni	FA-5/FQ-8:IL11
Wächtler Maria	FJ-2:IL08
Wang Chenxu	FR-10.4:IL01
Wang Jianwei	FR-10.3:IL04
Wang Min	FQ-2:IL05
Wang Xinpeng	FR-10.2:IL03
Wang Xuchen	FF-4:IL02

Ware Taylor	FL-6:IL02	Xu Dongyan	FK-1:IL28	Zega Valentina	FC-1:IL02
Warski Tymon	F:P03	Xu Xiao	FM-1:IL11	Zelený Martin	FM-1:L04
Was Gary S.	FR-8:IL03	Xu Xiaoshan	FD-4:IL09	Zenkevich Andrei	FD-3:L03
Waser Rainer	FH-1.2:IL18	Xu Yan	FC-2:IL05	Zhang Bokai	FK-1:L19
Webster Thomas	FQ:KL	Yang Junliang	FB-1:IL14	Zhang Guo-Jun	FR-10.1:IL03
Wei Yuezhou	FR-10.2:IL02	Yang Kuan	FH-3:L29	Zhang Xuexi	FM-2:IL05
Weitz Iris	FQ-4:L02	Yang Yunzhi Peter	FQ-5:IL02	Zhang Y. Shrike	FA-5/FQ-8:IL03
Wharry Janelle P.	FR-8:IL04	Yang Zhuoqing	FC-1:IL06	Zhou Lu	FO-3:L07
Wiemer Claudia	FH-1.1:L07	Yared Wadih	FA-1:L13	Zhou Peng	FD-3:L06
Wiendlocha Bartłomiej	FK-1:IL05	Ye Xiao-Wei	FO-2:IL04	Zhou Yujiao	FG-6:L03
Williams Christopher	FA-2:IL12	Yildizbakan Lemiha	F:P27	Zhu Songye	FO-1:IL07
Wilts Bodo	FP-3:IL09	Yong Uijung	FA-5/FQ-8:L12	Zhuk Maksim	FH-1.2:L10
Wördenweber Henrik	FI-1:L08	Yoshimura Masahiro	FQ-1:IL12	Ziebold Christian	FH-1.2:L09
Wu Jia-Min	FA-1:IL07	Yui Nobuhiko	FQ-1:IL02	Ziegler Martin	FH-3:IL16
Wu Ping	FM-1:L17	Yukihara Eduardo	FG-1:IL07	Ziegler Tobias	FH-3:IL07
Wu Xiaojun	FJ-1:IL05	Yun Hui-Suk	FA-1:IL10	Zinkle Steven	FR-6:IL13
Xia Yong	FO-4:IL06	Zak Alla	FI-3:IL02	Zollo Alessia	F:P18
Xie Wenjie	FK-1:IL11	Zakrzewska Katarzyna	FE-2:IL07	Zoubkova Kristyna	F:P23
Xiong Yujie	FJ-1:IL06	Zebarjadi Mona	FK-1:IL13	Zucolotto Valtencir	FQ-3:L06

Scientific Programme

9th FORUM ON NEW MATERIALS

OPENING SESSION

WELCOME ADDRESSES

Plenary Lectures

F:PL1 **Organic Actuators for Living Cell Opto Stimulation**
G. LANZANI, Center for Nano Science and Technology@PoliMi, Istituto Italiano di Tecnologia, and Department of Physics, Politecnico di Milano, Milano, Italy

F:PL2 **Brain-inspired Materials, Devices, and Circuits for Intelligent Systems**
YONG CHEN, University of California, Los Angeles, CA, USA

F:PL3 **Development of Conceptually New AIEgens for Biomedical Theranostics**
BEN ZHONG TANG, Department of Chemistry, The Hong Kong University of Science & Technology, Clear Water Bay, Kowloon, Hong Kong, China

SYMPOSIUM FA

3D PRINTING AND BEYOND: STATE-OF-THE-ART AND NEW PARADIGMS FOR ADDITIVE MANUFACTURING TECHNOLOGIES

Session FA-1

Additive manufacturing of ceramics and composites

FA-1:IL01 **Direct Ceramic Fabrication by Lithographic Additive Manufacturing for Energy Harvesting**
SOSHU KIRIHARA, Osaka University, Ibaraki City, Osaka, Japan

FA-1:IL02 **3D Printing of Hierarchical Porous Ceramics**
A.R. STUDART, ETH Zurich, Switzerland

FA-1:IL03 **Multimaterial 3D Printing of Functional Ceramics for Energy Applications**
M. TORRELL[1], A. PESCE[1], M. NUÑEZ[1], N. KOSTRETSOVA[1], A. MORATA[1], **A. TARANCÓN**[1, 2], [1]Catalonia Institute for Energy Research, Sant Adrià de Besòs, Barcelona, Spain; [2]ICREA, Barcelona, Spain

FA-1:IL04 **How can we Achieve High-strength and Tough 3D-printed Ceramics with Quite Simple Mechanistic Approaches?**
J. CHEVALIER[1], H. REVERON[1], M. SAADAOUI[2], M. MAILLARD[1], L. GREMILLARD[1], F. ZHANG[3], V. GARNIER[1], E. CAMPOSILVAN[4], J. ADRIEN[1], [1]Université de Lyon, INSA de Lyon, MATEIS CNRS UMR5510, Villeurbanne Cedex, France; [2]Université Mohamed V de Rabat, EMI, LERSIM, Rabat, Morocco; [3]KU Leuven (University of Leuven) and UZ Leuven (University Hospitals Leuven), Leuven, Belgium; [4]Mathym, Champagne-au-Mont-d'Or, France

FA-1:IL05 **Quality Aspects with Regard to 3D Printing of Ceramics**
H. FRIEDRICH, F. RAETHER, J. VOGT, Fraunhofer Zentrum für Hochtemperatur-Leichtbau HTL, Bayreuth, Germany

FA-1:IL06 **Additive Manufacturing of Ceramics and Ceramic Composites for Aerospace Applications**
J.J. BOWEN[1, 2], L.M. RUESCHHOFF[1], K.L. MARTIN[1, 2], D.P. STREET[1, 3], M.J.S. PARVELESCU[1, 2], **M.B. DICKERSON**[1], [1]Materials and Manufacturing Directorate, Air Force Research Laboratory, Wright-Patterson AFB, OH, USA; [2]UES Inc., Dayton, OH, USA; [3]NRC Research Associateship Programs, Washington, DC, USA

FA-1:IL07 **Additive Manufacturing and Properties of Silica Ceramic Cores**
JIA-MIN WU[1, 2], WEN ZHENG[1, 2], JIE ZHANG[1, 2], KANG-BO YU[1, 2], YU-SHENG SHI[1, 2]; [1]State Key Laboratory of Materials Processing and Die &Mould Technology, School of Materials Science and Engineering, Huazhong University of Science and Technology, Wuhan, China; [2]Engineering Research Center of Ceramic Materials for Additive Manufacturing, Ministry of Education, Wuhan, China

FA-1:IL08 **Innovative Zirconia-based Material Shaped by SLA 3D Printing**
C. CHAPUT, C. SCHICK, 3DCERAM-SINTO, Bonnac La Cote, France

FA-1:IL09 **Clinical Significance of 3D Printing in Bone Disorder**
S. BOSE, PH.D. HERMAN, B. LINDHOLM, School of Mechanical and Materials Engineering, Department of Chemistry, Elson Floyd College of Medicine, Washington State University, Pullman, WA, USA

FA-1:IL10 **Stereolithography of Ceramic Components using Binary Materials**
HUI-SUK YUN, Korea Institute of Materials Science, Changwon, South Korea

FA-1:IL11 **Integrated Design and 3D Printing of Porous Ceramics**
ZHANGWEI CHEN, Additive Manufacturing Institute, Shenzhen University, China

FA-1:IL12 **A Segregation Model Study of Suspension-based Additive Manufacturing**
CHANG-JUN BAE[1], J.W. Halloran[2], [1]3D Printing Materials Center, Korea Institute of Materials Science (KIMS), Changwon, South Korea; [2]Dept. of Materials Science and Engineering, University of Michigan, Ann Arbor, USA

FA-1:L13 **A Guide for Selecting Dispersants for Ceramic Filled Resins for Stereolithography**
W. YARED, University of Stuttgart, GSaME, Graduate School of Excellence advanced Manufacturing Engineering, Stuttgart, Germany

FA-1:L14 **Eutectic Ceramic Microstructures using Laser Powder Bed Fusion (L-PBF)**
J.E. MARTINEZ DOSAL, C. COLIN, M.H. BERGER, MINES Paris, PSL, Centre de Matériaux, UMR CNRS 7633, Evry, France

FA-1:IL15 **Additive Manufacturing of Implantable Biomaterials: Processing Challenges, Biocompatibility Assessment and Clinical Translation**
B. BASU, Materials Research Centre & Center for BioSystems Science and Engineering, Indian Institute of Science, Bangalore, India

Session FA-2

Additive manufacturing of polymeric, metallic and multi-material structures

FA-2:IL01 **Additive Manufacturing of Multi-material Structures**
A. BANDYOPADHYAY, School of Mechanical and Materials Engineering, Washington State University, Pullman, WA, USA

FA-2:IL02 **Multimaterial Components by Additive Manufacturing Technologies**
T. MORITZ, S. WEINGARTEN, J. ABEL, E. SCHWARZER, U. SCHEITHAUER, A. GÜNTHER, J. SCHILM, K. WÄTZIG, Fraunhofer Institute for Ceramic Technologies and Systems, Dresden, Germany

FA-2:IL03 **The Role of Rheology in Laser Sintering of Polymer Particles**
P. ANDERSON, Polymer Technology Group, Eindhoven University of Technology, Eindhoven, Noord-Brabant, The Netherlands

FA-2:IL04 **Nanoparticle Additivation of Polymer Powders for Powder Bed Fusion of Parts with Novel Optical and Magnetic Properties**
C. DONATE-BUENDIA, B. GÖKCE, Materials Science and Additive Manufacturing, University of Wuppertal, Wuppertal, Germany

FA-2:L05 **Two-photon Polymerisation of 3D PEDOT:PSS Composite Microstructures**
J.M. DELENTE, S. KOLAGATLA, L. FLOREA, School of Chemistry & AMBER, The SFI Research Centre for Advanced Materials and BioEngineering Research, Trinity College Dublin, Dublin 2, Ireland; N. LÓPEZ-LARREA, M. CRIADO-GONZALEZ, D. MECERREYES, POLYMAT University of the Basque Country UPV/EHU, Donostia-San Sebastián, Spain

FA-2:L06 **Residual Stress and Microstructure Gradients in Additively-manufactured Metallic Components Characterized by High-energy Synchrotron X-ray Diffraction**
J. KECKES, S.C. BODNER, J. TODT, Montanuniversität Leoben and Austrian Academy of Sciences, Leoben, Austria; N. SCHELL, Helmholtz Zentrum Geesthacht, Geesthacht, Germany

FA-2:L07 **Inconel-steel Multilayers by Liquid Dispersed Metal Powder Bed Fusion: Microstructure, Residual Stress and Property Gradients**
J. KECKES, **S.C. BODNER**, J. ZALESAK, J. TODT, J.F. KECKES, V. MAIER-KIENER, Montanuniversität Leoben and Austrian Academy of Sciences, Leoben, Austria; B. SARTORY, Materials Center Leoben, Leoben, Austria; N. SCHELL, Helmholtz Zentrum Geesthacht, Geesthacht, Germany; L.T.G. VAN DE VORST, The Netherlands Organisation for Applied Scientific Research, Eindhoven, The Netherlands; J.W. HOOIJMANS, J.J. SAURWALT, Admatec Europe BV, Moergestel, The Netherlands; S. MIRZAEI, Central European Institute of Technology CEITEC, Brno, Czech Republic

FA-2:IL08 **Two-color Irradiation for Volumetric Photopolymerization Confinement**
T.F. SCOTT[1,2], H.L. VAN DER LAAN[3], MARK A. BURNS[4,5], [1]Department of Chemical Engineering, Monash University, Clayton, VIC, Australia; [2]Department of Materials Science and Engineering, Monash University, Clayton, VIC, Australia; [3]Macromolecular Science and Engineering Program, University of Michigan, Ann Arbor, MI, USA; [4]Department of Chemical Engineering, University of Michigan, Ann Arbor, MI, USA; [5]Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI, USA

FA-2:IL09 **Selection of Microstructure under Extreme Solidification Conditions in Powder Bed Fusion type Additive Manufacturing of Metals**
YUICHIRO KOIZUMI, M. OKUGAWA, T. MAEDA, H. YOSHIMA, Y. MIYATA, N. KAZUFUMI, T. NAKANO, Osaka University, Suita, Osaka, Japan

FA-2:IL10 **Microstructure Control of Metals via Additive Manufacturing Processes**
M. SEITA, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

FA-2:L11 **Control of Density and Grain Structure of Laser Powder Bed-fused Nickel, Iron, Titanium and Aluminum Alloys: Simulation-driven Process Mapping**
V. BRAILOVSKI, Ecole de Technologie Superieure, Montreal, Canada

FA-2:IL12 **Multi- Material / Modality / Scale / Axis: Realizing Multi-Functional Products with Next-Generation AM Processes**
C.B. WILLIAMS, Virginia Tech, Blacksburg, VA, USA

FA-2:IL13 **High-strength and Programmable Meta-crystals**
MINH-SON PHAM, Imperial College London, London, UK

FA-2:IL14 **Additive Manufacturing of Architected Composites with Exceptional Energy Absorption**
L. VALDEVIT, J. BAUER, M. SALA CASANOVAS, University of California, Irvine, Irvine, CA, USA

FA-2:IL15 **Towards Additive Manufacturing of Novel Aluminum-based Self-healing Metal Matrix Composites by Directed Energy Deposition (DED)**
N. ELIAZ, D. SVETLIZKY, Department of Materials Science and Engineering, Tel-Aviv University, Ramat Aviv, Tel Aviv, Israel; B. ZHENG, S. JIANG, Y. ZHOU, L. VALDEVIT, J.M. SCHOENUNG, Department of Materials Science and Engineering, University of California at Irvine, CA, USA; E.J. LAVERNIA, US National Academy of Engineering, Irvine, CA, USA

FA-2:L16 **Numerical Analysis and Characterization of a 3D Printed Metallic Load Frame**
M. HAMID, KH. MCMILLAN, A.R. TIANO, K. OLSON, J. UTTER, J. TOROK, IBM, Rochester, MN, USA

FA-2:L17 **Mechanical Properties of a Case-hardened Low-alloyed Steel produced by PBF-LB**
K. KUTLEŠA, S.C. BODNER, J. KECKES, Montanuniversität Leoben, Leoben, Austria

Session FA-3
4D Printing

FA-3:IL01 **Moving 4D Printed Active Polymer Structures**
G. SCALET, Department of Civil Engineering and Architecture, University of Pavia - Italian Interuniversity Consortium on Materials Science and Technology (INSTM), Pavia, Italy

FA-3:L02 **4D Sugar Responsive Microstructures Fabricated via Two Photon Polymerisation**
A. ENNIS, D. NICADO, C. DELANEY, L. FLOREA, School of Chemistry & AMBER, the SFI Research Centre for Advanced Materials and BioEngineering Research, Trinity College Dublin, the University of Dublin, College Green, Dublin, Ireland

FA-3:L03 **Cyclic Ketene Acetals as Additives for the Formulation of Subtractive Manufacturing Resists: Properties and Applications**
M. CARLOTTI, O. TRICINCI, V. MATTOLI, Center for Materials Interfaces, Italian Institute of Technology, Pontedera, Italy

FA-3:IL04 **Multiscale 3D Printing of Active Electronics and Ingestible Devices**
YONG LIN KONG, Department of Mechanical Engineering, University of Utah, Salt Lake City, UT, USA

FA-3:IL05 **3D Printing of Functional Architectures built from Two-dimensional Materials**
S. BARG, University of Manchester, Manchester, UK

Session FA-4
Applications of additive manufacturing technologies

FA-4:IL01 **Additive Manufacturing - Recent Developments and Future Challenges**
D.L. BOURELL, The University of Texas at Austin, Austin, TX, USA

FA-4:L02 **Integration of 3D Laser Lithography and Micro-contact Printing for Bioinspired Surfaces with Advanced Wettability**
O. TRICINCI, F. PIGNATELLI, V. MATTOLI, Center for Materials Interfaces, Istituto Italiano di Tecnologia, Pontedera (PI), Italy

Focused Session FA-5 / FQ-8
3D Bioprinting of Soft Tissues and Organs
(Focused Joint Session with Conference FQ)

FA-5/FQ-8:IL01 **Two Photon Polymerization for Biofabrication**
R. NARAYAN, North Carolina State University, Raleigh, NC, USA

FA-5/FQ-8:IL02 **Biofabrication: From Additive Manufacturing to Bioprinting and Bioassembly for Regenerative Medicine Applications**
L. MORONI, Maastricht University, MERLN Institute for Technology-Inspired Regenerative Medicine, Complex Tissue Regeneration Department, Maastricht, The Netherlands

FA-5/FQ-8:IL03 **Putting 3D Bioprinting to the Use of Tissue Model Fabrication**
Y. SHRIKE ZHANG, Division of Engineering in Medicine, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA, USA

FA-5/FQ-8:IL04 **Multimaterial and Multiscale Biofabrication Approach**
C. DE MARIA, Research Center E. Piaggio and Dept. of Information Engineering at University of Pisa, Pisa, Italy

FA-5/FQ-8:IL05 **Scaffold-free Bio-3D Printing for Solid Organ Fabrication**
KOICHI NAKAYAMA, Department of Regenerative Medicine and Biomedical Engineering, Faculty of Medicine, Saga University, Saga, Japan

FA-5/FQ-8:IL06 **Biofabricating Murine and Human Myo-substitutes for Rapid Volumetric Muscle Loss Restoration**
M. COSTANTINI, Institute of Physical Chemistry - PAS, Warsaw, Poland; C. GARGIOLI, Università degli studi di Roma - Tor Vergata, Rome, Italy

FA-5/FQ-8:L07 **Nano-encapsulation of Stem Cell-derived β-cell Aggregates using 3D Bioprinting System**
YEONGGWON JO, D.G. HWANG, M. KIM, S. CHO, J. JANG, Pohang University of Science and Technology (POSTECH), Pohang, Gyeongbuk, South Korea

FA-5/FQ-8:L08 **Modular Assembly of 3D Bioprinted Engineered Heart Tissue to Reconstruct Contractile Direction to Mimic Myocardial Fiber Orientation**
DONG GYU HWANG, U. YONG, H. CHOI, J. JANG, POSTECH, Pohang, Gyeongbuk, South Korea

FA-5/FQ-8:IL09 **Strategies for Bioprinting of Volumetric Tissue Constructs**
M. GELINSKY, Centre for Translational Bone, Joint and Soft Tissue Research, TU Dresden, Dresden, Germany

FA-5/FQ-8:IL10 **Organ-on-chip Technology for the Study of Neuro-degenerative Disorders**
A. POLINI, CNR Nanotec, Lecce, Italy

FA-5/FQ-8:IL11 **3D in Vitro Model of the Microbiota-gut-bone Axys**
G. VOZZI, F. BIAGINI, F. MONTEMURRO, C. DE MARIA, Research Center "E. Piaggio" and Department of Information Engineering, University of Pisa, Pisa, Italy; M. CALVIGIONI, E. GHELARDI, Research and New Technologies in Medicine and Surgery, University of Pisa, Pisa, Italy; G. CERQUENI, S. MARCHI, M. MATTIOLI-BELMONTE, DISCLIMO, Università Politecnica delle Marche, Ancona Italy.

FA-5/FQ-8:L12 **A Biohybrid 3D-printed Tissue-sensor Platform for Continuous Monitoring of Cardiac Muscle Contractions**
UIJUNG YONG[1], D. KIM[1], H. KIM[2], D. G. HWANG[1], S. CHO[1], H. NAM[1], S. KIM[1], T. Y. KIM[1], U. JEONG[1], K. KIM[1], W. K. CHUNG[1], W.H. YEO[2], J. JANG[1], [1]POSTECH, Pohang, Gyeongsangbuk-do, South Korea; [2]Georgia Institute of Technology, Atlanta, GA, USA

FA-5/FQ-8:L13 **3D Bioprinting of Human Islet-like Cellular Aggregates-Vascular Platform for Modeling Diabetes**
MYUNGJI KIM, S. CHO, D.G. HWANG, J. JANG, POSTECH, Pohang, Gyeongbuk, South Korea

FA-5/FQ-8:IL14 **Engineering the Cellular Niche Via CAD/CAM Laser Processing**
J. SAKSENA[1], S.C. SKLARE[1], B.T. VINSON[1], Y. HUANG[2], **D.B. CHRISEY**[1], [1]Tulane University, New Orleans, LA, USA; [2]University of Florida, Gainesville, FL, USA

FA-5/FQ-8:IL15 **Implantable Bioprinted Devices for Vascularisation Studies**
B. DERBY, Department of Materials, University of Manchester, Manchester, UK

FA-5/FQ-8:IL16 **3D Bioprinted Models in Human Organogenesis and Disease**
M. DOMINGOS, Department of Mechanical, Aerospace and Civil Engineering, School of Engineering, Faculty of Science and Engineering & The Henry Royce Institute,The University of Manchester, Manchester, UK

FA-5/FQ-8:IL17 **Toward in vitro Tissue Modeling using Bioprinting Technology**
JINAH JANG, POSTECH, Pohang, Gyeongbuk, South Korea

SYMPOSIUM FB
FLEXIBLE AND STRETCHABLE ELECTRONICS: MATERIALS, DEVICES AND APPLICATIONS

Session FB-1
Materials and fabrication processes

FB-1:IL01 **Flexible and Stretchable Organic Electronics**
QIBING PEI, University of California at Los Angeles, Los Angeles, CA, USA

FB-1:IL02 **New Inks for 2D, 3D and 4D Eelectronics**
S. MAGDASSI, Institute of Chemistry, The Hebrew University of Jerusalem, Jerusalem, Israel

FB-1:IL03 **Hybrid Perovskite Solar Cells: A Game Changer for near future Photovoltaics**
G. GRANCINI, University of Pavia, Department of Chemistry, Pavia, Italy

FB-1:IL04 **Designing Biointegrated Polymer Electronics and Biocomposites**
J. RIVNAY, Northwestern University, Chicago, USA

FB-1:L05 **Laser Enhancement of Pristine PEDOT:PSS Conductivity and Applications in Organic Electronics**
J. TROUGHTON[1], J. RODRIGUEZ-PEREIRA[2], N. PEILLON[1], J. MACAK[2], T. DJENIZIAN[1, 3], M. RAMUZ[1], [1]Ecole des Mines de Sainte Etienne, Gardanne, France; [2]Center of Materials and Nanotechnologies, University of Pardubice, Pardubice, Czechia, [3]Center of Physical-Chemical Methods of Research and Analysis, Al-Farabi Kazakh National University, Almaty, Kazakhstan

FB-1:L06 **High Resolution Transfer Lithography for Conformable Circuits on Developable High-curvature Surfaces**
I. CESINI, A. OTTOMANIELLO, M. CARLOTTI, V. MATTOLI, Center for Materials Interfaces, Istituto Italiano di Tecnologia, Pontedera, Italy

FB-1:IL07 **Electrodes by Selective Laser Sintering**
M. HAUKKA, University of Jyväskylä, Department of Chemistry, Jyväskylä, Finland

FB-1:L08 **Benefits and Challenges Associated to Oxide Coating of Metallic Nanowire Networks**
C. SANCHEZ[1, 2], A. SEKKAT[1], M. AKBARI[1], C. CRIVELLO[1], D.T. PAPANASTSAIOU[1], L. BARDET[1], C. JIMÉNEZ[1], D. BELLET[1], D. MUÑOZ-ROJAS[1], [1]Univ. Grenoble Alpes, LMGP, CNRS, Grenoble INP, Grenoble, France; [2]Univ. Grenoble Alpes, CNRS, Grenoble INP, CERAG, Grenoble, France

FB-1:L09 **3D Printed Soft Organic Thermoelectric Generators**
H.E. BAYSAL, F. MOLINA-LOPEZ, KU Leuven, Leuven, Belgium

FB-1:L10 **Efficient and Stable Transparent Electrodes based on Silver Nanowire Networks**
L. BARDET[1, 2], M. AKBARI[1], C. CRIVELLO[1], L. RAPENNE[1] , H. ROUSSEL[1], M. WEBER[1], C. JIMÉNEZ[1], D. MUÑOZ-ROJAS[1], A. DENNEULIN[2], D. BELLET[1], [1]Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; [2]Univ. Grenoble Alpes, CNRS, Grenoble INP, LGP2, Grenoble, France

FB-1:IL11 **Printed and Flexible Electronics and Photonics with Graphene and 2D Materials for Sensing, Wearable Electronics and Bioelectronics**
F. TORRISI, Imperial College London, London, UK

FB-1:IL12 **High-detectivity Wearable Organic Photodetectors Processed from Green Solvent for Self-powered Pulse Rate and Oximetry Measurements**
THUC-QUYEN NGUYEN, Center for Polymers and Organic Solids, University of California Santa Barbara (UCSB), Santa Barbara, CA, USA

FB-1:L13 **Plasmonic ITO Nanoparticles' Ink for IR Thermo-enabled Applications on Flexible Substrates**
A. MAZZOTTA, M. CARLOTTI, A. OTTOMANIELLO, V. MATTOLI, Center for Materials Interfaces, Italian Institute of Technology, Pontedera, Italy; A. GABBANI, M. RUGGERI, E. FANTECHI, F. PINEIDER, A. PUCCI, Department of Chemistry, University of Pisa, Pisa, Italy

FB-1:IL14 **Flexible Organic and Perovskite Optoelectronics fabricated via Roll-to-Roll Printing Process**
JUNLIANG YANG, Central South University, Changsha, China

FB-1:L15 **Solution-processed CuI for p-type Transparent Electronics**
KYUNGHAN AHN[1], AO LIU[2], YONG-YOUNG NOH[2], **MYUNG-GIL KIM**[1], [1]School of Advanced Materials Science & Engineering, Sungkyunkwan University, Suwon, South Korea; [2]Dept. of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, South Korea

FB-1:L16 **Easy Fabrication of Stretchable Waveguide for E-skin Applications**
L. FLIEGANS, M. RAMUZ, S. BLAYAC, École des Mines de Saint-Étienne, Campus Georges Charpak Provence, Gardanne, France

FB-1:L17 **Fabrication of Inkjet Printed Tunable BST/P(VDF-TrFE) Dielectrics for Flexible Varactors**
T.P. MACH, J.R. BINDER, Institute for Applied Materials (IAM-ESS), Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

Session FB-2
Device physics, mechanics and design

FB-2:L01 **Study in Operando of Organic Semiconductor Stretchability**
V. LAFARGE, C. SERBUTOVIEZ, M. BENWADIH, A. REVAUX, Univ. Grenoble Alpes, CEA, Liten, DTNM, Grenoble, France

FB-2:L02 **Finite Element Models of Soft Energy Harvesters based on Piezoelectric Polymers**
R. DENZER, Division of Solid Mechanics, Lund University, Lund, Sweden

FB-2:L03 **Electro-mechanical Behaviour of Semiconducting Nanonets**
S. SHARMA[1], F. MORISOT[1], T. ARJMAND[1], M. BRACCINI[1], F. VOLPI[2], C. TERNON[1], [1]Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; [2]Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMaP, Grenoble, France

Session FB-3
Applications of flexible/stretchable electronics

FB-3:IL01 **Printed Polymer Field-effect Transistors Operating at Radio-Frequencies**
M. CAIRONI, Center for Nano Science and Technology @PoliMi, Istituto Italiano di Tecnologia, Milano, Italy

FB-3:IL02 **Soft Neuromorphic Computing**
M.J. MIRSHOJAEIAN HOSSEINI[1], YI YANG[1], E. DONATI[2], T. YOKOTA[3], S. LEE[3]; G. INDIVERI[2], T. SOMEYA[3], **R.A. NAWROCKI**[1], [1]School of Engineering Technology, Purdue University, West Lafayette, IN, USA; [2]Institute of Neuroinformatics, University of Zurich and ETH Zurich, Zurich, Switzerland; [3]Department of Electrical and Electronics Engineering, The University of Tokyo, Tokyo, Japan

FB-3:IL03 **Silver Nanowire Networks for Stretchable Energy Harvesters: Properties and Challenges**
D.T. PAPANASTASIOU[1], S.E. HAIM[2], **A. SYLVESTRE**[2], S. BASROUR[3], D. BELLET[1], [1]Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; [2]Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France; [3]Univ. Grenoble Alpes, CNRS, Grenoble INP, TIMA, Grenoble, France

FB-3:IL04 **Organic Neuromorphic Electronics and Biohybrid Systems**
Y. VAN DE BURGT, Eindhoven University of Technology, Eindhoven, Netherlands

FB-3:IL05 **Integrated Flexible Electronics and System-engineered Microrobotics**
O.G. SCHMIDT, Center for Materials, Architectures and Integration of Nanomembranes (MAIN), TU Chemnitz, Germany School of Science, TU Dresden, Germany

FB-3:L06 **Development and Application of SWCNT Spray and Sheets**
SEIKI CHIBA, Chiba Science Institute, CEO, Tokyo, Japan; M. WAKI, CEO, Wits Inc., Tochigi, Japan; M. TAKESHITA, M. UEJIMA, CNT Lab., Zeon Corporation, Kawasaki, Japan

FB-3:IL07 **Direct Assembly of Micro LEDs and their Thermal Management for Stretchable Display**
JU SEUNG LEE, HAELEEN HONG, **TAE-IL KIM**, School of Chemical Engineering, Sungkyunkwan University, Suwon, South Korea

FB-3:IL08 **Design Challenges toward Flexible E-Textiles Systems**
J.S. JUR, A.C. MILLS, I. KIM, B. LI, Z. ROSENBERG, E. COBARRUBIAS, C. KNOWLES, B. JU, Y. ZHOU, B. SENNIK, O. TURSCHAK, I. HINES, NC State University, Wilson College of Textiles, Department of Textile Engineering, Chemistry and Science, Raleigh, NC, USA

FB-3:IL09 **Flexible and Printed Sensors and Biosensors: From Materials and Processes to Systems and Applications**
L. PETTI, P. LUGLI, Free University of Bozen, Bolzano, Italy

FB-3:IL10 **Biomaterial Lasers for Sensing and Imaging**
M. HUMAR, J. Stefan Institute, Ljubljana, Slovenia; Faculty of Mathematics and Physics, University of Ljubljana, Ljubljana, Slovenia; CENN Nanocenter, Ljubljana, Slovenia

FB-3:IL11 **Flexible and Reliable Organic Solar Cell**
KENJIRO FUKUDA[1], T. SOMEYA[1,2], [1]RIKEN, Saitama, Japan; [2]The University of Tokyo, Japan

FB-3:IL12 **Computational and Physical Optical Models of the Eye for Medical Applications**
M. RAMUZ, S. REGAL, Flexible Electronics Department, Mines St Etienne, Gardanne, France

FB-3:IL13 **Wireless Epidermal Electronic System to Simultaneously Measure Electrocardiograms and Seismocardiograms from Human Body**
M.E. HESAR, N. SEYEDSADRKHANI, D. KHAN, **S. INGEBRANDT**, Institute of Materials in Electrical Engineering 1, RWTH Aachen University, Aachen, Germany

FB-3:IL14 **Thermoelectric-based Adjustable Wearable Camouflage Devices**
SUNMI SHIN, Department of Mechanical Engineering, National University of Singapore, Singapore

SYMPOSIUM FC
RESEARCH ADVANCES ON MICRO/NANO SYSTEMS AND THEIR APPLICATIONS

Keynote Lectures

FC:KL1 **Plasma Nanotechnology for New Materials and Devices**
K. OSTRIKOV, Queensland University of Technology, Brisbane, Australia

FC:KL2 **High Performance Flexible and Printed Electronics**
R. DAHIYA, Bendable Electronics and Sensing Technologies (BEST) Group, James Watt School of Engineering, University of Glasgow, Glasgow, UK

FC:KL3 **(Porous) Silicon NanoPhotonics: Applications, Opportunities and Challenges**
G. BARILLARO, Dipartimento di Ingegneria dell'Informazione, Università di Pisa, Pisa, Italy

Session FC-1
Physical MEMS/NEMS; MOEMS/NOEMS

FC-1:IL01 **MEMS Cantilever Sensors**
M. FAHRBACH, J. XU, **E. PEINER**, Technische Universität Braunschweig, Institute of Semiconductor Technology (IHT), and Laboratory for Emerging Nanometrology (LENA), Braunschweig, Germany

FC-1:IL02 **3D-printing and Wet-metallization for Sensors: a Coriolis Mass Flowmeter Operating in the Mode-split Conditions**
V. ZEGA[1], L. GAFFURI PAGANI[2], M. INVERNIZZI[3], C. CREDI[3], R. SURIANO[3], R. BERNASCONI[3], P. CARULLI[2], A. FRANGI[1], M. LEVI[3], L. MAGAGNIN[3], G. LANGFELDER[2], A. CORIGLIANO[1], [1]DICA, Politecnico di Milano; [2]DEIB, Politecnico di Milano; [3]CMIC, Politecnico di Milano, Milano, Italy

FC-1:IL03 **Multifunctional Platforms on Paper**
R. MARTINS[1,2], D. GASPAR[2], I.M. MENDES[1], A.C. MARQUES[1], A. PIMENTEL[1], D. NUNES[1], L. PEREIRA[1,2], E. FORTUNATO[1,2], [1]i3N/CENIMAT, Department of Materials Science, Faculty of Science and Technology, Universidade NOVA de Lisboa and CEMOP/UNINOVA, Caparica, Portugal; [2]AlmaScience, Caparica, Portugal

FC-1:IL04 **Tuneable Opto-NEMS Resonators**
U. EMRE ALI[1], G. MODI[2], R. AGARWAL[2], **H. BHASKARAN**[1], [1]University of Oxford, Oxford, UK; [2]University of Pennsylvania, USA

FC-1:IL05 **MEMS and Microsystems for Space Applications**
M. RAIS-ZADEH, NASA Jet Propulsion Laboratory, California Institute of Technology Pasadena, CA, USA

FC-1:IL06 **Non-silicon 3D Integrated Surface Micromachining for Near-zero-power and Flexible MEMS Devices Applications**
ZHUOQING YANG, Shanghai Jiao Tong University (SJTU), Shanghai, China

Session FC-2

Chemical micro/nano-sensors and systems; Bio-MEMS/NEMS; microfluidics, lab-on-a-chip

FC-2:IL01 **Integration of Colloidal Nanocrystals in Functional Superstructures: Emerging Opportunities for Micro- and Nanofabrication**
M.L. CURRI, Dipartimento di Chimica, Università degli Studi di Bari Aldo Moro, Bari, Italy

FC-2:IL02 **Monolithic Silicon Carbide Intracortical Neural Interfaces for Long-term Human Implantation**
C. FREWIN[1], M. BEYGI[2], E. BERNARDIN[2], C. FENG[2, 3], F. LA VIA[4], W. DOMINGUEZ-VIQUEIRA[5], **S.E. SADDOW**[2, 6], [1]NeuroNexus, LLC, Ann Arbor, MI, USA; [2]Dept. of Electrical Engineering, University of South Florida, Tampa, FL, USA; [3]Dept. of Mechanical Engineering, University of South Florida, Tampa, FL, USA; [4]IMM-CNR, Catania, Sicily, Italy; [5]Moffitt Cancer Center, Tampa, FL, USA; [6]Dept. of Medical Engineering, University of South Florida, Tampa, FL, USA

FC-2:IL03 **Rapid Protein and Cell Assay System by Polymeric Microfiber Membrane**
MADOKA TAKAI, The University of Tokyo, Tokyo, Japan

FC-2:IL04 **Monitoring Integration Processes of Individual Single-walled Carbon Nanotubes into Sensors by Raman Spectroscopy**
M. HALUSKA, S. JUNG, C. ROMAN, C. HIEROLD, Micro and Nanosystems ETH Zürich, Zurich, Switzerland

FC-2:IL05 **Nanofluidics: A New Arena for Materials Science**
YAN XU, Department of Chemical Engineering, Graduate School of Engineering, Osaka Prefecture University, Japan; Japan Science and Technology Agency (JST), PRESTO, Japan NanoSquare Research Institute, Osaka Prefecture University, Japan

Session FC-3

Smart micro-nano systems and components integration

FC-3:IL01 **Near-Zero Power Integrated Microsystems for the IoT**
M. RINALDI, SMART Center, Northeastern University, Boston, MA, USA

FC-3:L02 **Systematization of Magnetic Structures in Magnetistrictive Microwires for Sensor Application**
A. CHIZHIK, J. GONZALEZ, Universidad del País Vasco, UPV/EHU, San Sebastián, Spain; A. ZHUKOV, Universidad del País Vasco, UPV/EHU, San Sebastián, Spain & IKERBASQUE, Basque Foundation for Science, Bilbao, Spain; A. STUPAKIEWICZ, Laboratory of Magnetism, University of Bialystok, Bialystok, Poland; P. GAWRONSKI, AGH Univ. of Science and Technology, Faculty of Physics and Applied Computer Science, Krakow, Poland

FC-3:IL03 **On-site Energy using Piezoelectric Thin Films**
HIROKI KUWANO, Tohoku University, Sendai, Japan

FC-3:L04 **Handling of Direct Laser Written Micro-structures via Ultrathin Films for Controlled Placement on Complex Surfaces**
A. OTTOMANIELLO, M. CARLOTTI, O. TRICINCI, **V. MATTOLI**, Center for Materials Interfaces, Istituto Italiano di Tecnologia, Pontedera, Italy; F. VAN DEN HOED, P. RAFFA, Department of Chemical Engineering - Product Technology, University of Groningen, Groningen, The Netherlands

Session FC-4

Radio frequency MEMS, energy harvesting and power supply MEMS

FC-4:IL01 **Metamaterials Based RF Microsystems for Telecommunication Applications**
R. MARCELLI, E. PROIETTI, G.M. SARDI, G. CAPOCCIA, CNR-IMM, Roma, Italy; G. BARTOLUCCI, University of Roma "Tor Vergata", Roma, Italy

FC-4:IL02 **Electrical Measurements & Instruments using Weakly Coupled Micromechanical Resonators**
HONGLONG CHANG, Northwestern Polytechnical University, Xi'an, China

FC-4:IL03 **Deposition of Piezoelectric PZT Thin Films on a Variety of Substrates**
ISAKU KANNO, Kobe University, Kobe, Japan

SYMPOSIUM FD

RECENT ACHIEVEMENTS IN MULTIFERROIC AND MAGNETOELECTRIC MATERIALS

Session FD-1

Advances in materials synthesis and processing

FD-1:IL01 **Multiferroics and High Pressure, a Never Ending Story**
D. DELMONTE, E. GILIOLI, Institute of Materials for Electronics and Magnetism (IMEM), CNR, Parma, Italy

FD-1:IL02 **Preparation of Single Crystalline BiFeO3 Thin Films and their Electronic and Atomic Structures Studied by Synchrotron Radiation**
SEIJI NAKASHIMA, H. FUJISAWA, University of Hyogo, Himeji, Japan; T. Higuchi, Tokyo University of Science, Tokyo, Japan; N. HAPPO, Hiroshima City University, Hiroshima, Japan; A. YASUI, T. KINOSHITA, Japan Synchrotron Radiation Research Institute, Hyogo, Japan; Y. YAMAMOTO, R. MATSUMOTO, K. KIMURA, K. HAYASHI, Nagoya Institute of Technology, Nagoya, Japan

FD-1:L03 **HP/HT Synthesis and Characterization of Bi2CuMnO6, a RT Longe-range Ordered Magnetic Perovskite**
C. COPPI, D. DELMONTE, R. CABASSI, E. GILIOLI, Institute of Materials for Electronics and Magnetism (IMEM), CNR, Parma, Italy; F. MEZZADRI, Department of Chemical Sciences, Life and Environmental Sustainability, University of Parma, Parma, Italy; F. CUGINI, M. SOLZI, Department of Mathematical, Physical and Computer Sciences, University of Parma, Parma, Italy

FD-1:IL04 **Magneto-ionics in Transition Metal Nitrides and its Potential for Artificial Synapses**
Z. TAN[1], J. DE ROJAS[1], S. MARTINS[1], A. NICOLENCO[1], J.L. COSTA-KRÄMER[2], A. QUINTANA[3], E. MENÉNDEZ[1], **J. SORT**[1, 4], [1]Departament de Física, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, Spain; [2]IMN-Instituto de Micro y Nanotecnología (CNM-CSIC), Tres Cantos, Madrid, Spain; [3]Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus UAB, Barcelona, Spain; [4]Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain

FD-1:IL05 **Structural Transitions between Metastable Phases in Bismuth-containing Perovskite Multiferroics**
A.N. SALAK[1], J.P. CARDOSO[1], D. DELMONTE[2], E. GILIOLI[2], V.V. SHVARTSMAN[3], D.D. KHALYAVIN[4], [1]Department of Materials and Ceramics Engineering and CICECO - Aveiro Institute of Materials, University of Aveiro, Aveiro, Portugal; [2]Institute of Materials for Electronics and Magnetism, Parma, Italy; [3]Institute for Materials Science and CENIDE - Center for Nanointegration Duisburg-Essen, University of Duisburg-Essen, Essen, Germany; [4]ISIS Facility, Rutherford Appleton Laboratory, Chilton, Didcot, Oxfordshire, UK

FD-1:L06 **Structural, Magnetic and on Magnetocaloric Properties near the Paramagnetic to Ferromagnetic Phase Transition in La0.5o0.1Ca0.4MnO3 Oxide**
N. ASSOUDI, Université de Sfax, Kasserine, Tunisia

Session FD-2

Multiferroic nanostructures, self-assembly and nanocomposites

FD-2:IL01 **Growth and Functional Properties of Vertically Aligned Multiferroic Oxide Nanocomposites**
AIPING CHEN, Y. SHARMA, K.T. KANG, Center for Integrated Nanotechnologies (CINT), Los Alamos National Laboratory, Los Alamos, NM, USA

FD-2:IL02 **Switchable Spin Springs at Oxide Interfaces**
K. DÖRR, M.M. KOCH, L. BERGMANN, A.D. RATA, A. HERKLOTZ, Institute of Physics, MLU Halle-Wittenberg, Halle, Germany

FD-2:L03 **Nanostructured Multiferroic Pb(Zr,Ti)O3-NiFe2O4 Thin-film Composites**
A. MATAVŽ, P. KOŽELJ, **V. BOBNAR**, Condensed Matter Physics Dept., Jožef Stefan Institute, Ljubljana, Slovenia; M. WINKLER, K. GEIRHOS, P. LUNKENHEIMER, Experimental Physics V, Center for Electronic Correlations and Magnetism, University of Augsburg, Augsburg, Germany

FD-2:IL04 **A Journey into the Tunable Antiferromagnetic Spin Textures of BiFeO3**
J. FISCHER, S. FUSIL, **M. BIBES**, V. GARCIA, CNRS-Thales, Palaiseau, France; A. HAYKAL, V. JACQUES, Univ. Montpellier, France

FD-2:IL05 **Ferroelectric Photovoltaics**
A. BHATNAGAR, Zentrum für Innovationskompetenz (ZIK) SiLi-nano, Martin Luther Universität Halle-Wittenberg, Halle (Saale), Germany

FD-2:L06 **Crystal and Magnetic Structure of BiMnO3-based Ceramics**
D.V. KARPINSKY[1,2], D.V. ZHALUDKEVICH[2], S.I. LATUSHKA[2], M.V. SILIBIN[1], V.A. KHOMCHENKO[3], [1]National Research University of Electronic Technology "MIET", Zelenograd, Moscow, Russia; [2]Scientific-Practical Materials Research Centre of NAS of Belarus, Minsk, Belarus; [3]CFisUC, Department of Physics, University of Coimbra, Coimbra, Portugal

Session FD-3

Magnetoelectric characterization and electric field control of magnetization

FD-3:IL01 **Nanomagnetism of Magnetoelectric Granular Thin-film Antiferromagnets**
D. MAKAROV, Helmholtz-Zentrum Dresden-Rossendorf e.V., Institute of Ion Beam Physics and Materials Research, Dresden, Germany

FD-3:IL02 **Nanoscale Magnetoelectric Effects Revealed by High-resolution Imaging**
M. GHIDINI, University of Parma, Parma, Italy; Diamond Light Source, UK; University of Cambridge, UK

FD-3:L03 **Operando Synchrotron Measurements of Magnetoelectric Coupling Effects in bi-layered Composite Multiferroics Comprising Ferroelectric HfO2**
A. DMITRIYEVA, V. MIKHEEV, A. CHOUPRIK, **A. ZENKEVICH**, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow region, Russia; Yu. MATVEYEV, Deutsches Elektronen-Synchrotron, Hamburg, Germany; G. VINAI, V. POLEWCZYK, P. TORELLI, Istituto Officina dei Materiali, Trieste, Italy: E.Y. TSYMBAL, University of Nebraska-Lincoln, Lincoln, USA

FD-3:IL04 **Tailoring Interface States in Oxide Tunnel Devices by Ferro-ionic Resistive Switching**
J. SANTAMARIA, GFMC, Departamento de Física de Materiales, Universidad Complutense de Madrid, Madrid, Spain

FD-3:IL05 **Local Writing of Exchange Biased Domains in a Heterostructure of Co/Pd pinned by Magnetoelectric Chromia**
U. SINGH, presently at XWave; M. STREET, presently at Seagate; W. ECHTENKAMP, C. BINEK, **S. ADENWALLA**, University of Nebraska-Lincoln, NE, USA

FD-3:L06 **Electric Field Control of Spin Pumping in Y3Fe5O12 Thin Film**
PENG ZHOU, Y. QI, T. ZHANG, Key Laboratory of Green Preparation and Application for Materials, Ministry of Education, Hubei Provincial Key Laboratory of Polymers, Dept. of Materials Science and Engineering, Hubei University, Wuhan, China; J. ZHANG, College of Electrical and Information Engineering, Zhengzhou University of Light Industry, Zhengzhou, China; G. SRINIVASAN, Physics Dept., Oakland University, Rochester, MI, USA

FD-3:IL07 **Magnetoelectric Effect in Composite Ferrite-perovskite Ceramics at Macro- and Microscopic Scales**
V.V. SHVARTSMAN[1], M. NAVEED UL-HAQ[2], D. LEWIN[1], D.C. LUPASCU[1], [1]Institute for Materials Science, University of Duisburg-Essen, Essen, Germany; [2]Department of Physics, COMSATS University Islamabad, Chak Shahzad, Islamabad, Pakistan

FD-3:IL08 **Discovery of Magnetoelectric Quadrupole Order and Visualization of their Domain Structure via Nonreciprocal Linear Dichroism**
KENTA KIMURA, T. KATSUYOSHI, T. KIMURA, Department of Advanced Materials Science, The University of Tokyo, Kashiwa, Japan; P. BABKEVICH, H.M. RONNOW, Laboratory for Quantum Magnetism, Institute of Physics, École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland; M. TOYODA, Department of Physics, Tokyo Institute of Technology, Meguro-ku, Tokyo, Japan; K. YAMAUCHI, ISIR-SANKEN, Osaka University, Ibaraki, Japan; Y. SAWADA, Center for Advanced High Magnetic Field Science (AHMF), Osaka University, Osaka, Japan; S. KIMURA, Institute for Materials Research, Tohoku University, Sendai, Japan

FD-3:IL09 **Composite Material for Multiferroic Applications**
A. OMELYANCHIK[1,2], V. ANTIPOVA[1], C. GRITSENKO[1], V. KOLESNIKOVA[1], L. MAKAROVA[1,3], D. PEDDIS[2,4], K. LEVADA[1], A. AMIROV[1,5], **V. RODIONOVA**[1], [1]Immanuel Kant Baltic Federal University, Kaliningrad, Russia; [2]Department of Chemistry and Industrial Chemistry (DCIC), University of Genova, Genova, Italy; [3]Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia; [4]Institute of Structure of Matter-CNR, Monterotondo Stazione, Rome, Italy; [5]Amirkhanov Institute of Physics of Dagestan Federal Research Center, Russian Academy of Sciences, Makhachkala, Russia

FD-3:IL10 **Controlling the Electrical, Magnetoelectric and Thermal Properties in Epitaxial-strain-engineered Ferroic Films**
E. LANGENBERG, Department of Condensed Matter Physics, Universitat de Barcelona, Barcelona, Spain

FD-3:IL11 **Multiferroics: Recent Developments and Trends**
A. LOIDL, Center for Electronic Correlations and Magnetism, University of Augsburg, Augsburg, Germany

Session FD-4

Multiferroics dynamics, new effects, devices and applications

FD-4:IL01 **Non-linear Magnetoelectric Interactions and Electric Field Control of Magnetism in Ferrimagnetic Oxides**
Y. LIU, HONGWEI QU, **G. SRINIVASAN**, Oakland University, Rochester, MI, USA; M. POPOV, I.V. ZAVISLYAK, Taras Shevchenko National University of Kyiv, Ukraine; P. ZHOU, T. ZHANG, Hubei University, Hubei, China; M. PAGE, Air Force Research Lab., Dayton, OH, USA

FD-4:IL02 **Room-temperature Magnetoelectric Effect in a Liquid Crystal**
H. UEDA, Paul Scherrer Institut, Villigen, Switzerland; T. AKITA, Y. UCHIDA, T. KIMURA, University of Tokyo, Kashiwa, Chiba, Japan

FD-4:IL03 **Optical Magnetoelectric Effect in Multiferroics**
YOUTAROU TAKAHASHI, Department of Applied Physics and Quantum Phase Electronics Center (QPEC), University of Tokyo, Tokyo, Japan; RIKEN Center for Emergent Matter Science (CEMS), Saitama, Japan

FD-4:IL04 **Giant Thermal Transport Tuning at a Metal/Ferroelectric Interface**
Y. ZANG, C. DI, Z. GENG, X. YAN, D. JI, X. JIANG, H. FU, J. WANG, W. GUO, H. SUN, L. HAN, Y. ZHOU, Z. GU, D. KONG, H. ARAMBERRI, C. CAZORLA, J. ÍÑIGUEZ, R. RURALI, L. CHEN, J. ZHOU, D. WU, M. LU, **YUEFENG NIE**, Y. CHEN, X. PAN, Nanjing University, Nanjing, China

FD-4:L05 **High-frequency Molecular Dynamics Simulations of the Electrocaloric Effect in Ferroelectric PbTiO3**
S. LISENKOV, University of South Florida, Tampa, FL, USA

FD-4:L06 **Microstructure and Electro-optic Response of Thick Epitaxial BaTiO3 Films Integrated on Silicon (001) for Applications in Silicon Photonics**
M. REYNAUD[1], W. LI[1], A.B. POSADAS[1], **A.A. DEMKOV**[1], Z. DONG[2], D. WASSERMAN[2], H. PARK[3,4], J.H. WARNER[3,4], W. CAO[5], G.Z. MASHANOVICH[5], [1]Department of Physics, University of Texas at Austin; [2]Department of Electrical and Computer Engineering, University of Texas at Austin; [3]Materials Science and Engineering Program and Texas Materials Institute, The University of Texas at Austin, Austin, TX, USA; [4]Walker Department of Mechanical Engineering, The University of Texas at Austin, Austin, TX, USA; [5]Optoelectronics Research Centre, Faculty of Engineering and Physical Sciences, University of Southampton, Southampton, UK

FD-4:L07 **Manoeuvring Phase Connectivity to Realise Enhanced Magnetoelectric Effect in distributed Disc structured Ni/PZT Composite**
A. KUMAR[1], A. AROCKIARAJAN[1,2], [1]Department of Applied Mechanics, Indian Institute of Technology Madras, Chennai, India; [2]Ceramic Technologies Group-Centre of Excellence in Materials and Manufacturing for Futuristic Mobility, Indian Institute of Technology Madras, Chennai, India

FD-4:IL08 **Ferroelectric - Magnetoelectric: Known Structures - Unknown Properties**
N.N. PODDUBNAYA, V.M. LALETSIN, Institute of Technical Acoustics of the National Academy of Sciences of Belarus, Vitebsk, Belarus

FD-4:IL09 **Multiferroicity in Hexagonal Rare Earth Ferrites**
XIAOSHAN XU, University of Nebraska-Lincoln, Lincoln, NE, USA

FD-4:IL10 **Taylored Magnetostrictive Multilayers for Magnetoelectric Sensors**
D. MEYNERS, Inorganic Functional Materials, Institute of Materials Science, Faculty of Engineering, Kiel University, Kiel, Germany

SYMPOSIUM FE
FUNCTIONAL NANOMATERIALS FOR NEW GENERATION SOLID STATE CHEMICAL SENSORS

Session FE-1
Carbon nanostructures (CNTs, graphene)-based gas sensors

FE-1:IL01 **Gas Sensing of NiO-SCCNTs Core-shell Heterostructures: Optimization by Radial Modulation of the Hole-accumulation Layer**
M.H. RAZA[1], K. MOVLAEE[2,3], S.G. LEONARDI[3], N. BARSAN[4], G. NERI[3], **N. PINNA**[1], [1]Institut für Chemie and IRIS Adlershof, Humboldt-Universität zu Berlin, Berlin, Germany; [2]Center of Excellence in Electrochemistry, School of Chemistry, College of Science, University of Tehran, Iran; [3]Department of Engineering, University of Messina, Messina, Italy; [4]Institute of Physical and Theoretical Chemistry, University of Tübingen, Tübingen, Germany

FE-1:IL02 **High-performance Flexible Gas Sensors based on Carbon-based Nanostructures**
SEON-JIN CHOI, Division of Materials of Science and Engineering, Hanyang University, Seoul, South Korea

FE-1:IL03 **Chemical Design of Carbon-based Nanostructures for Sensing Applications**
A. SINITSKII, University of Nebraska-Lincoln, Lincoln, NE, USA

FE-1:L04 **Dual-hydrogen Bond Donor Functionalized Single-walled Carbon Nanotubes for improved NO2 Sensing**
JOON-SEOK LEE, S.H. CHOI, W.J. CHOI, J.W. SEO, S.J. CHOI, Division of Materials of Science and Engineering, Hanyang University, Seoul, South Korea

Session FE-2
Semiconductor metal oxides-based gas sensors

FE-2:IL01 **Vapour Deposition of Functional Semiconductor Nanomaterials for Gas Sensing**
C.S. BLACKMAN, Department of Chemistry, University College London, UK

FE-2:IL02 **Solid-state Micro Gas Sensors for Detection of Oxygen and Acidic Gases**
KENGO SHIMANOE[1], S. IDE[2], K. WATANABE[1], K. SUEMATSU[1], [1]Faculty of Engineering Sciences, Kyushu University, Japan; [2]Mitsui-Mining & Smelting Co., Ltd., Japan

FE-2:IL03 **Improvement of Sensing Properties of Semiconductor Gas Sensors by Controlling Gas Diffusivity and Reactivity**
YASUHIRO SHIMIZU, T. HYODO, Graduate School of Engineering, Nagasaki University, Nagasaki, Japan

FE-2:IL04 **Light-activated Semiconductor Gas Sensors: Achievements and Challenges**
M.N. RUMYANTSEVA[1], A.F. NASRIDDINOV[1, 2], A.S. CHIZHOV[1], R.B. VASILIEV[1, 2], S.D. TOKAREV[3], O.A. FEDOROVA[3], A.M. GASKOV[1], [1]Chemistry Department, Moscow State University, Moscow, Russia; [2]Department of Materials Science, Moscow State University, Moscow, Russia; [3]A.N. Nesmeyanov Institute of Organoelement Compounds of Russian Academy of Sciences, Moscow, Russia

FE-2:IL05 **Multi-scale Structuring of Nanoparticle Networks for Enhanced Chemical Sensing**
A. TRICOLI, Nanotechnology Research Laboratory, Australian National University, Canberra, Australia

FE-2:IL06 **High Selective Catalyst-filtered Chemoresistive Gas Sensors**
A. GÜNTNER, Department of Endocrinology, Diabetology, and Clinical Nutrition, University Hospital Zurich (USZ) and University of Zurich (UZH), Zurich, Switzerland

FE-2:IL07 **Recent Advances in Thin Films of Metal Oxides as Gas Sensing Materials**
K. ZAKRZEWSKA, AGH-University of Science and Technology, Faculty of Computer Science, Electronics and Telecommunications, Institute of Electronics, Kraków, Poland

FE-2:IL08 **Precious Metal-free Catalytic Combustion-type CO Gas Sensor Based on CeO2-ZrO2-ZnO Solid Solution**
SHINJI TAMURA, Osaka University, Suita, Osaka, Japan

FE-2:L09 **A CuO/SiO2 Nanocomposite for Highly Selective H2S Gas Sensing**
A. PAUL, C. WEINBERGER, T. WAGNER, **M. TIEMANN**, Paderborn University, Department of Chemistry, Paderborn, Germany

Session FE-3
Novel 2D inorganic materials-based gas sensors

FE-3:IL01 **2D Materials for Gas Sensors**
L. OTTAVIANO, Dipartimento di Scienze Fisiche e Chimiche, Università dell'Aquila, L'Aquila, Italy

FE-3:IL02 **Liquid Metal Facilitated Synthesis of 2D Materials**
T. DAENEKE, RMIT University, Melbourne, Victoria, Australia

FE-3:IL03 **Layered Amorphous Metal Oxide Gas Sensors by Controlled Oxidation of 2D-MDs**
V. PAOLUCCI[1], J. DE SANTIS[1], G. GIORGI[2, 3], C. CANTALINI[1], [1]Department of Industrial and Information Engineering and Economics, University of L'Aquila, Italy; [2]Department of Civil and Environmental Engineering (DICA), University of Perugia, Italy; [3]CNR-SCITEC, Perugia, Italy

Session FE-4
Enzyme-free sensors based on functional nanomaterials

FE-4:IL01 **Gamma Rays Irradiated WO3 for Electrochemical Sensing of Depressive Biomarkers**
C. SEKAR, N. LAVANYA, A.C. ANITHAA, Dept. of Bioelectronics & Biosensors, Alagappa University, Karaikudi, TN, India

FE-4:IL02 **Capacitive Field-effect Devices for Biosensor Applications**
M.J. SCHOENING, FH Aachen, Institute of Nano- and Biotechnologies, Juelich, Germany

FE-4:IL03 **Optical Detection of Chemicals and Biological Entities on Gold Nanostructured Solid Supports**
R.E. IONESCU, Laboratoire Lumière, Nanomatériaux et Nanotechnologies-L2n, CNRS ERL 7004, Université de Technologie de Troyes, Troyes, France

Session FE-5
Nanocomposite/hybrid/heterostructure-based chemical- and bio-sensors

FE-5:IL01 **MWCNTs Based Smart Fabrics for Wearable Gas Sensors**
R.T. RAJENDRA KUMAR, Advanced Materials and Devices Laboratory (AMDL), Dept. of Nanoscience and Technology, Bharathiar University, Coimbatore, India

FE-5:L02 **Flexible Plasmonic PEGDA Hydrogels for Biosensing Applications**
B. MIRANDA[1, 2], S. DE MARTINO[3], R. MORETTA[1], P. DARDANO[1], I. REA[1], C. FORESTIERE[2], L. DE STEFANO[1], [1]Institute of Applied Sciences and Intelligent Systems, Napoli, Italy; [2]DIETI, Università degli Studi di Napoli "Federico II", Napoli, Italy; [3]Materias s.r.l., Napoli, Italy

FE-5:L03 **Organic-inorganic Hybrid Materials: NO and NO2 Sensing Properties and Surface Reactivity**
A. NASRIDDINOV[1], S. TOKAREV[2], O. FEDOROVA[2], M. RUMYANTSEVA[1], [1]Chemistry Department, Lomonosov Moscow State University, Moscow, Russia; [2]A.N. Nesmeyanov Institute of Organoelement Compounds RAS, Moscow, Russia

FE-5:L04 **Single Walled Carbon Nanotube-polymer Composite for Real-time Wireless Heavy Metal Ion Sensing**
SEUNG-HO CHOI, J.S. LEE, W.J. CHOI, J.W. SEO, S.J. CHOI, Hanyang University, Seoul, South Korea

FE-5:IL05 **Gas Sensors based on Metal Oxide Nano-heterojuntions**
E. LLOBET, E. NAVARRETE, Universitat Rovira i Virgili, MINOS, Tarragona, Spain

FE-5:IL06 **Tin Dioxide Based Nanocomposite for Electrochemical and Gas Sensing Applications**
N. LAVANYA, Dept. of Electronic Engineering, University of Messina, Messina, Italy; Dept. of Bioelectronics & Biosensors, Alagappa University, Karaikudi, TN, India

FE-5:IL07 **Nanoparticle Networks for Label-free Biosensing**
D. TSOUKALAS, E. SKOTADIS, M. KAINOURGAKI, Dept. of Applied Physics, National Technical University of Athens, Greece; G. TSEKENIS, Biomedical Research Foundation of the Academy of Athens, Athens, Greece

FE-5:IL08 **LDI-Mass Spectrometry based on Nanomaterials for Biomedical Applications**
JAE-CHUL PYUN, Department of Materials Science and Engineering, Yonsei University, Seoul, South Korea

SYMPOSIUM FF
ELECTROMAGNETIC METAMATERIALS AND METASURFACES: RECENT RESEARCH ACHIEVEMENTS AND NEW PARADIGMS

Session FF-1
Physics and modelling of metamaterials / metadevices

FF-1:IL01 **New Trends for Hybrid Metamaterials and Metasurfaces**
M. LAPINE, University of Technology Sydney, Ultimo, Australia

FF-1:IL02 **Around the Plasmonic Nanoparticle Cycle: From a New Chiral Optical Effect to Applications in Quantum Optics**
V.K. VALEV, Department of Physics, University of Bath, Bath, UK

FF-1:IL03 **Selective Visualization of Multipoles by Cathodoluminescence**
T. SANNOMIYA, Tokyo Institute of Technology, Yokohama, Japan

FF-1:L04 **Spatial Multiplexing Method for Multiwavelength Metalens**
SANGWON BAEK[1], J. KIM[2], Y. KIM[2], J. RHO[2], J.-L. LEE[1], [1]Department of Materials Science and Engineering, Pohang University of Science and Technology, South Korea; [2]Department of Mechanical Engineering, Pohang University of Science and Technology, South Korea

FF-1:IL05 **Thermal Radiation Management by Means of Nanoantennas**
M. CENTINI[1,2], M.C. LARCIPRETE[1], R. LI VOTI[1], M. BERTOLOTTI[1], C. SIBILIA[1], M. ANTEZZA[1,2,3], [1]Sapienza University of Rome, Department of Basic and Applied Sciences for Engineering, Rome, Italy; [2]Laboratoire Charles Coulomb (L2C), UMR 5221 CNRS-Université de Montpellier, Montpellier, France; [3]Institut Universitaire de France, Paris, France

Session FF-2
Novel concepts and new materials

FF-2:IL01 **Nanopillars Arrays as Anisotropic Metamaterials and Metasurfaces**
A.V. LAVRINENKO[1], E. SHKONDIN[1], O. TAKAYAMA[1], R. MALUREANU[1], M. E. ARYAEE PANAH[1], O.Y. YERMAKOV[2], A.A. BOGDANOV[2], S. CHATTERJEE[3], G. STRANGI[3], [1]Technical University of Denmark, Kgs. Lyngby, Denmark; [2]ITMO University, Saint Petersburg, Russia; [3]Case Western Reserve University, Cleveland, USA

FF-2:IL02 **Some Recent Advances in Non-Hermitian Metastructures**
V. GALDI, University of Sannio, Benevento, Italy

FF-2:IL03 **Topological Slow Light beyond the Time-bandwidth Limit**
K.L. TSAKMAKIDIS, K. BASKOURELOS, Department of Physics, National and Kapodistrian University of Athens, Panepistimioupolis, Athens, Greece

FF-2:IL04 **Lithium Niobate Metasurfaces for Nonlinear Light Sources**
T. PERTSCH, Abbe Center of Photonics, Friedrich Schiller University Jena, Jena, Germany

FF-2:L05 **Ultrathin Suspended Membrane Metasurfaces for Efficient Terahertz Light Absorption and Modulation**
A. OTTOMANIELLO, V. MATTOLI, Center for Materials Interfaces, Istituto Italiano di Tecnologia, Pontedera, Italy; P. VEZIO, A. TREDICUCCI, Dipartimento di Fisica, University of Pisa, Pisa, Italy; S. ZANOTTO, A. PITANTI, Laboratorio NEST Scuola Normale Superiore, and Istituto Nanoscienze CNR, Pisa, Italy

FF-2:IL06 **Superemission and Superabsorption Effects in Metamaterials**
S.I. MASLOVSKI, Instituto de Telecomunicações and Department of Electronics, Telecommunications and Informatics, University of Aveiro, Aveiro, Portugal

FF-2:L07 **Hierarchically Structured Functional Ceramic Composites for Microwave Absorption using Graphene Augmented Inorganic Nanofibers**
A. SAFFAR SHAMSHIRGAR[1], R.E. ROJAS HERNÁNDEZ[1], G.C. TEWARI[2], J.F. FERNÁNDEZ[3], R. IVANOV[1], M. KARPPINEN[2], I. HUSSAINOVA[1], [1]Department of Mechanical and Industrial Engineering, Tallinn University of Technology, Tallinn, Estonia; [2]Department of Chemistry and Materials Science, Aalto University, Aalto, Finland; [3]Institute of Ceramics and Glass (ICV-CSIC), Madrid, Spain

FF-2:L08 **Ultrashort Pulse Laser-fabricated Metasurfaces and Optoelectronic Platforms on Diamond**
A. BELLUCCI, M. MASTELLONE, M. GIROLAMI, V. SERPENTE, R. POLINI, S. ORLANDO, A. SANTAGATA, **D.M. TRUCCHI**, Institute for Structure of Matter ISM-CNR, Monterotondo (RM), Italy

Session FF-3
Mie-resonant nanophotonics

FF-3:IL01 **Artificial Chirality Evolution in Micro-/Nano-scale 3D Plasmonic Metamaterials**
JUNSUK RHO, Pohang University of Science and Technology (POSTECH), Pohang, South Korea

FF-3:IL02 **Mie Metasurfaces with van der Waals Antennas and Nanostructures**
V. BABICHEVA, Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, USA

FF-3:IL03 **Multipole Analysis and Tuning of All-dielectric Metasurfaces Supporting High-quality Optical Resonances and Quasi-trapped Mode Responses**
A.B. EVLYUKHIN, Institute of Quantum Optics, Leibniz Universität Hannover, Hannover, Germany

Session FF-4
Functional metasurfaces

FF-4:IL01 **Geometric Phase and Nonlinear Photonic Metasurfaces**
GUIXIN LI, Department of Materials Science and Engineering, Southern University of Science and Technology, Shenzhen, China

FF-4:IL02 **Temporally Modulated Metasurfaces for Extreme Control of Light and Electromagnetic Radiation**
XUCHEN WANG, A. DÍAZ RUBIO, V. ASADCHY, G. PTITCYN, M. MIRMOOSA, S. TRETYAKOV, Department of Electronics and Nanoengineering, Aalto University, Espoo, Finland

FF-4:IL03 **Novel Devices based on Active and Tunable Dielectric Nanoantennas**
A.I. KUZNETSOV, Institute of Materials Research and Engineering, A*STAR (Agency for Science, Technology and Research), Singapore

FF-4:IL04 **Metamaterials for Ultra-sensitive IR Spectroscopy**
TAKUO TANAKA, Metamaterials Laboratory, RIKEN Cluster for Pioneering Research Innovative Photon Manipulation Research Team, RIKEN Center for Advanced Photonics Institute of Post-LED Photonics, Tokushima University, Wako, Saitama, Japan

FF-4:IL05 **Conformable Holographic Metasurfaces**
A. DI FALCO, School of Physics and Astronomy, University of St Andrews, UK

Session FF-5
Quantum and topological meta-optics

FF-5:IL01 **Topologically Protected Transport in Photonic Crystals**
M.I. SHALAEV, W. WALASIK, **N.M. LITCHINITSER**, Duke University, Durham, NC, USA

FF-5:IL02 **Quantum Circuit**
F.A. BOVINO, Dipt. SBAI, University of Rome "La Sapienza", Rome, Italy

FF-5:IL03 **High-performance Topological Cavity Surface Emitting Laser (TCSEL)**
XIAO HU, International Center for Materials Nanoarchitectonics (WPI-MANA), National Institute for Materials Science (NIMS), Tsukuba, Japan

FF-5:IL04 **Probing Leaky and Guided Polaritonic Modes in Planar Dielectric Structures Coupled to 2D Semiconductors**
A. SAMUSEV, School of Physics and Engineering, ITMO University, St. Petersburg, Russia

FF-5:IL05 **Nonlinear Optical Switching and Tunability in AlGaAs Nanoantennas and Metasurfaces**
C. DE ANGELIS, D. ROCCO, Department of Information Engineering, University of Brescia, Brescia, Italy

FF-5:IL06 **Topological Photons and Phonons in Nanophotonic Architectures**
E. VERHAGEN, Center for Nanophotonics, AMOLF, Amsterdam, The Netherlands

FF-5:IL07 **Topological Phase Transition in Photonic Crystals and Metamaterials**
D. FELBACQ, University of Montpellier, Montpellier, France

FF-5:IL08 **Quantum Topological Edge States induced by Photon-photon Interactions**
A.N. PODDUBNY, Ioffe Institute, St. Petersburg, Russia; Australian National University, Canberra ACT, Australia

Session FF-6

Active metamaterials

FF-6:IL01 **Metasurfaces for Holography and Light Harvesting: New Approaches with Orbital Angular Moment Modes and Tailored Disorder**
S.A. MAIER, Nanoinstitute Munich, LMU Munich, Germany

FF-6:IL02 **Controlling the Parity and Time-reversal Symmetry of Metasurfaces in Current-driven Graphene Dirac Plasmons**
TAIICHI OTSUJI, Research Institute of Electrical Communication, Tohoku University, Sendai, Japan

FF-6:IL03 **Broadband Active Control of Light-matter Interactions with Metal-dielectric Nanocavities**
N. MACCAFERRI, Department of Physics and Materials Science, University of Luxembourg, Luxembourg, & Department of Physics, Umeå University, Umeå, Sweden

FF-6:IL04 **Non-Hermitian Mechanics**
C. COULAIS, University of Amsterdam, The Netherlands

FF-6:IL05 **Low-threshold Topological Nanolasers**
HONG-GYU PARK, Department of Physics at Korea University, Seoul, South Korea

SYMPOSIUM FG

ADVANCES IN INORGANIC LUMINESCENT MATERIALS

Session FG-1

Physics, modelling, processing and characterization of luminescent materials

FG-1:IL01 **Accelerating Phosphor Discovery and Development through Data Science**
M. Amachraa[1], Z. Wang[1], C. Chen[1], S. Hariyani[2], J. Brgoch[2], **SHYUE PING ONG**[1], [1]Materials Science and Engineering Program, University of California San Diego, La Jolla, CA, USA; [2]Department of Chemistry, University of Houston, College of Natural Sciences and Mathematics, Houston, TX, United States

FG-1:IL02 **Ag-Sensitized Tb3+/Yb3+ Codoped Silica-Zirconia Glasses and Glass-Ceramics**
F. ENRICHI, Department of Computer Science, University of Verona, Verona, Italy

FG-1:IL03 **Rapid Screening of New Phosphor Compositions using Novel Soft Chemical Technique**
KENJI TODA, Niigata University, Niigata, Japan

FG-1:IL04 **The Principles of Luminescence Thermometry – From Applications to Fundamental Questions**
M. SUTA, Inorganic Photoactive Materials, Institute of Inorganic Chemistry, Heinrich Heine University Düsseldorf, Düsseldorf, Germany

FG-1:IL05 **Plasmon Mediated Directionality and Spatial Coherence in Rare Earth Quantum Emitters**
J. FERNÁNDEZ-MARTÍNEZ[1], L. SANCHEZ-GARCIA[1], S. CARRETERO-PALACIOS[1], J. BRAVO-ABAD[2], P. MOLINA[1], N.J.J. VAN HOOF[3], J. GÓMEZ RIVAS[3], M.O RAMÍREZ[1], **L.E. BAUSÁ**[1], [1]Dept. Física de Materiales, Instituto de Materiales Nicolás Cabrera and Condensed Matter Physics Center (IFIMAC), Universidad Autónoma de Madrid, Madrid, Spain; [2]Dept. Física Teórica de la Materia Condensada and Condensed Matter Physics Center (IFIMAC), Universidad Autónoma de Madrid, Madrid, Spain; [3]Dutch Institute for Fundamental Energy Research, DIFFER, and Eindhoven University of Technology, AE Eindhoven, The Netherlands

FG-1:IL06 **Rare-earth Activated SiO2-SnO2 Photonic Glass-ceramics**
THI NGOC LAM TRAN[1, 2, 3], A. SZCZUREK[1], S. VARAS[1], C. ARMELLINI[1], A. CARPENTIERO[1], A. CHIAPPINI[1], E. IACOB[4], G. ISCHIA[5], S. BERNESCHI[6], G. NUNZI CONTI[6], G.C. RIGHINI[6], M. BOLLANI[7], F. SCOTOGNELLA[2, 8], P. GŁUCHOWSKI[9], A. LUKOWIAK[9], A. CHIASERA[1], M. FERRARI[1], [1]IFN-CNR CSMFO Lab. and FBK Photonics Unit, Povo, Trento, Italy; [2]Department of Physics, Politecnico di Milano, Milano, Italy; [3]Department of Materials Technology, Faculty of Applied Science, Ho Chi Minh City University of Technology and Education, Thu Duc District, Ho Chi Minh City, Vietnam; [4]Fondazione Bruno Kessler, Centre for Materials and Microsystems, Micro Nano Facility, Povo, Trento, Italy; [5]Department of Industrial Engineering, University of Trento, Povo, Trento, Italy; [6]MiPLab, IFAC-CNR, Sesto Fiorentino, Italy; [7]IFN-CNR, P.zza Leonardo da Vinci, Milano, Italy; [8]Center for Nano Science and Technology@PoliMi, Istituto Italiano di Tecnologia (IIT), Milan, Italy; [9]Institute of Low Temperature and Structure Research, PAS, Wroclaw, Poland

FG-1:IL07 **TL and OSL as Research Tools in Luminescence: Possibilities and Limitations**
E.G. YUKIHARA, Department of Radiation Safety and Security, Paul Scherrer Institute, Villigen PSI, Switzerland

FG-1:IL08 **Electron Transfer between Lanthanide Impurities: Insights from Multiconfigurational Calculations**
J.J. JOOS, LumiLab, Department of Solid State Sciences, Ghent University, Gent, Belgium; Z. BARANDIARÁN, L. SEIJO, Departamento de Química, Instituto Universitario de Ciencia de Materiales Nicolás Cabrera, and Condensed Matter Physics Center (IFIMAC), Universidad Autónoma de Madrid, Madrid, Spain

FG-1:L09 **New Near-IR Optical Transitions in Sm3+ and Sm3+-Yb3+ doped Tellurite Glasses and Application in Tissue Transmission Spectroscopy**
E. KUMI-BARIMAH, G. SHARMA, Y. CHEN, R. TENWICK, M. EL-MURISH, A. JHA. School of Chemical and Process Engineering, University of Leeds, Woodhouse, Leeds, UK

FG-1:IL10 **Growth and Characteristics of Novel Single Crystals for Electro-optical Applications**
KIYOSHI SHIMAMURA, E.G. VÍLLORA, Optical Single Crystals Group, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

FG-1:IL11 **Theoretical Discussion of Mn4+ Luminescence**
M.G. BRIK[1, 2, 3], A.M. SRIVASTAVA[4], M. PIASECKI[3], [1]College of Sciences, Chongqing University of Posts and Telecommunications, Chongqing, China; [2]Institute of Physics, University of Tartu, Tartu, Estonia; [3]Institute of Physics, Jan Dlugosz University, Czestochowa, Poland; [4]Srivastava consulting LLC, Niskayuna, NY, USA

FG-1:L12 **Delineating the Effects of Metal Co-doping for Improved Upconversion in Inorganic Phosphors: A Case Study in Gadolinium Vanadate**
A. CHAUHAN[1], S. KATARIA[1], D. BUSKO[1], F.A. CARDONA[1], **A. TURSHATOV**[1], B.S. RICHARDS[1, 2], [1]Institute of Microstructure Technology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany; [2]Light Technology Institute, Karlsruhe Institute of Technology, Karlsruhe, Germany

FG-1:L13 **Alkaline-alumina-borate Glass-ceramics with Chromium: the Effect of the Matrix Components Ratio on the Luminescent Properties**
A. BABKINA, E. KULPINA, K. ZYRYANOVA, A. BUKHVOSTOV, N. NIKONOROV, ITMO University, Saint-Petersburg, Russia

FG-1:L14 **Carbon Dots Impregnated Transparent Fluorescent Polymer Materials**
C.-M. SINGARAVELU[1], X. DESCHANELS, C. REY, J. CAUSSE, ICSM, University of Montpellier, CEA, CNRS, ENSCM, Marcoule, France

FG-1:L15 **Stable Aqueous Colloidal Solutions of Nd3+: LaF3 Nanocrystals with Bright Luminescence in the Near IR Spectral Range**
YU.V. ORLOVSKII, E.A. VAGAPOVA, A.S. VANETSEV, Institute of Physics, University of Tartu, Tartu, Estonia; YU.V. ORLOVSKII, A.V. POPOV, E.O. ORLOVSKAYA, E.A. VAGAPOVA, A.T. SHAIDULIN, E.E. TIMOFEEVA, O.V. UVAROV, Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; A.T. SHAIDULIN, D. MENDELEEV, University of Chemical Technology of Russia, Moscow, Russia; S.G. FEDORENKO, Voevodsky Institute of Chemical Kinetics and Combustion SB RAS, Novosibirsk, Russia

Session FG-2

Phosphors, quantum dots and low dimensional materials for lighting and displays

FG-2:IL01 **Sensitization of Ceramic Eu3+ Activated Luminescent Materials for Solid State Lighting**
T. JÜSTEL, F. BAUR, Münster University of Applied Sciences, Steinfurt, Germany

FG-2:IL02 **Direct Laser Patterning as a Possible Strategy for Spatially Controlled QDs Formation**
F. ANTOLINI, F. LIMOSANI, R. CARCIONE, ENEA C.R. Frascati, Fusion and Technologies for Nuclear Safety and Security Department, Physical Technologies for Safety and Health Division, Micro and Nanostructure Laboratory, Italy; L. ORAZI, Department of Science and Methods for Engineering, University of Modena and Reggio Emilia, Reggio Emilia, Italy; R. GILLANDERS, I.D.W. SAMUEL, University of St. Andrews, St. Andrews, UK

FG-2:IL03 **Utilizing Deep-red Emitting Mn4+ Phosphors for Horticultural Lighting**
F. BAUR, T. JÜSTEL, Münster University of Applied Sciences, Steinfurt, Germany

FG-2:L04 **Large Size Persistent Luminescence Materials**
T. DELGADO, B. VIANA, PSL University, Chimie ParisTech, IRCP-CNRS, Paris, France; D. RYTZ BREVALOR, Sarl, Les Sciernes-d'Albeuve, Switzerland; E. VÉRON, M. ALLIX, CNRS, CEMHTI UPR 3079, Univ. Orléans, Orléans, France

Session FG-3

Advances in scintillator development and upconversion materials

FG-3:IL01 **Tailored Upconversion Nanocrystals Optimized for High Quantum Yield or Efficient Energy Transfer**
C. HOMANN, C. DREES, A.N. RAJ, R. KURRE, J. PIEHLER, **M. HAASE**, University of Osnabrück, Osnabrück, Germany; K. BUSCH, University of Münster, Germany; L. KRUKEWITT, F. FRENZEL, B. GRAUEL, C. WÜRTH, U. RESCH-GENGER, BAM, Berlin, Germany; J. BOLZE, Panalytical, Almelo, The Netherlands

FG-3:IL02 **Upconversion Nanoparticles in Nanobiomedicine**
J.A. CAPOBIANCO, Concordia University, Department of Chemistry and Biochemistry and Centre for Nanoscience Research, Montreal, Quebec, Canada

FG-3:IL03 **Multiphoton Fluorescence Upconversion with Hetero-structured 2D Colloidal Nanocrystals**
A.H. KHAN[1,2], G.H.V. BERTRAND[2], A. TEITELBOIM[3], A. POLOVITSYN[2], J. PLANELLES[4], J.I. CLIMENTE[4], D. ORON[3], **I. MOREELS**[1,2], [1]Department of Chemistry, Ghent University, Ghent, Belgium; [2]Istituto Italiano di Tecnologia, Genova, Italy; [3]Department of Physics of Complex Systems, Weizmann Institute of Science, Rehovot, Israel; [4]Departament de Química Física i Analítica, Universitat Jaume I, Castelló de la Plana, Spain

Session FG-4

Sensing and imaging

FG-4:IL01 **Ultra-sensitive Luminescent Thermometry by Cr3+ Doped Materials**
SETSUHISA TANABE, M. BACK Graduate School of Human & Environmental Studies, Kyoto University, Kyoto, Japan

FG-4:IL02 **Multi-wavelength Lanthanide-based Nanoparticles for Biomedical and Beyond Applications**
E. HEMMER, University of Ottawa, Department of Chemistry and Biomolecular Sciences, Ottawa, Ontario, Canada

FG-4:IL03 **Eu(III) and Tb(III) Complexes for Biosensing Applications**
F. PICCINELLI, C. NARDON, M. BETTINELLI, Luminescent Materials Laboratory, University of Verona, Verona, Italy

FG-4:IL04 **Single-cell Thermodynamics: Measurement of Cellular Heat Dissipation via Transient Imaging**
P. SONG, H. GAO, Z. GAO, **BIN KANG**, State Key Laboratory of Analytical Chemistry for Life Science, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing, China

FG-4:L05 **Facile Fabrication of Carbon Dots based Fluorescent Strips for Florimetric ON-OFF Sensor**
C.M. SINGARAVELU, X. DESCHANELS, C. REY, **J. CAUSSE**, ICSM, University of Montpellier, CEA, CNRS, ENSCM, Marcoule, France

Session FG-5

Chemi-, bio-, sono-, thermo- and mechano-luminescence

FG-5:IL01 **Using EuD4TEA to Detect Impacts, Radiation Exposure, and Surface Temperatures in Adverse Environments**
W.A. HOLLERMAN, Department of Physics, University of Louisiana at Lafayette, Lafayette, LA, USA

FG-5:IL02 **Development of Novel Chemiluminescent Materials for Cancer Treatment**
C.M. MAGALHÃES, P.G. BERDULLAS, J.C.G. ESTEVES DA SILVA, **L. PINTO DA SILVA**, Chemistry Research Unit of University of Porto, Porto, Portugal

Session FG-6

Light management for active applications and luminescent materials integration in devices

FG-6:IL01 **Simulating Out-coupling and Radiation Patterns from Luminescent Materials in Lighting Applications**
Y. MEURET, B. KARADZA, A. CORREIA, KU Leuven, ESAT, Light and Lighting Laboratory, Ghent, Belgium

FG-6:L02 **Optimal Quantum Dot Luminescent Solar Concentrator Double and Triple Tandem Structures Based on Ray Tracing Simulations**
T. DE BRUIN, **W. VAN SARK**, Copernicus Institute of Sustainable Development, Utrecht University, Utrecht, The Netherlands

FG-6:L03 **Thermometric and Pressure Independent Nano-probe via Upconversion Photoluminescence: Application to Temperature Measurement in Tribological Contacts**
YUJIAO ZHOU, L. BOIS, C. JOURNET-GAUTIER, Lab. des Multimatériaux et Interfaces, UMR CNRS 5615, Université Lyon1-CNRS, Villeurbanne, France; S. DESCARTES, D. PHILIPPON. Univ Lyon, INSA Lyon, CNRS, LaMCoS - UMR5259, Villeurbanne, France; G. LEDOUX, Institut Lumière Matière, UMR CNRS 5306, Université Lyon1-CNRS, Villeurbanne, France

FG-6:IL04 **Nanomaterials and Molecular Photoanodes for Light-driven Water Splitting**
J. LI, H. CHEN, C.A. TRIANA, **G.R. PATZKE**, University of Zurich, Department of Chemistry, Zurich, Switzerland

FG-6:L05 **Unclonable Anti-counterfeiting Based on Randomly Distributed Microphosphor Particles under Microlens Arrays**
V. KUMAR, S. DOTTERMUSCH, A. CHAUHAN, N. KATUMO, B.S. RICHARDS, I.A. HOWARD, Institute of Microstructure Technology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany Light Technology Institute, Karlsruhe Institute of Technology, Karlsruhe, Germany

Session FG-7

Medical applications and bioimaging

FG-7:IL01 **It's Getting Hot in Here: Intracellular Luminescent Thermometers**
L.D. CARLOS, Phantom-g, CICECO-Aveiro Institute of Materials, Physics Department, University of Aveiro, Campus Universitário de Santiago, Aveiro, Portugal

FG-7:IL02 **Lanthanide-doped Nanoparticles for Applications in Theranostics**
F. VETRONE, Institut National de la Recherche Scientifique, Centre Énergie, Matériaux et Télécommunications, Université du Québec, Varennes, Canada

FG-7:IL03 **Ultrafast Photochemistry produces Superbright Short-wave Infrared Dots for Low-dose in Vivo Imaging**
H.D.A. SANTOS[1,2], I. ZABALA[3], Y. SHEN[1], J. LIFANTE[4,5], E. XIMENDES[1,4], M. LAURENTI[3,4], D. MENDEZ-GONZALEZ[3], S. MELLE[6], O.G. CALDERON[6], E. LOPEZ CABARCOS[3], N. FERNANDEZ[4,5], I. CHAVES-COIRA[7], D. LUCENA-AGELL[10], L. MONGE[4,6], M.D. MACKENZIE[8], J. MARQUES-HUESO[9], C.M.S. JONES[9], C. JACINTO[2], B. DEL ROSAL[11], A.A. KAR[9], J. RUBIO RETAMA[3,4], **D. JAQUE**[1,4], [1]Fluorescence Imaging Group, Depto de Física de Materiales, Facultad de Ciencias, Universidad Autónoma de Madrid, Madrid, Spain; [2]Group of Nano-Photonics and Imaging, Instituto de Física, Universidade Federal de Alagoas, Maceió, Brazil; [3]Depto de Química en Ciencias Farmacéuticas, Universidad Complutense de Madrid, Spain; [4]Nanobiology Group, Instituto Ramón y Cajal de Investigación Sanitaria, Hospital Ramón y Cajal, Madrid, Spain; [5]Fluorescence Imaging Group, Depto de Fisiología, Facultad de Medicina, Universidad Autónoma de Madrid, Madrid, Spain; [6]Dept. of Optics, Complutense University of Madrid, Madrid, Spain; [7]Dept. of Anatomy, Histology and Neuroscience, Facultad de Medicina, Universidad Autónoma de Madrid, Madrid, Spain; [8]Institute of Photonics and Quantum Sciences, School of Physics, Heriot-Watt University, Edinburgh, UK; [9]Institute of Sensors, Signals and Systems (ISSS), School of Engineering & Physical Sciences (EPS), Heriot-Watt University, Edinburgh, UK; [10]Chemical and Physical Biology, Centro de Investigaciones Biologicas, Consejo Superior de Investigaciones Cientificas CIB–CSIC, Madrid, Spain; [11]Centre for Micro-Photonics, Faculty of Science, Engineering and Technology, Swinburne University of Technology, Hawthorn, VIC, Australia

FG-7:IL04 **Photoactive Nanoclay Carriers and Functionalized Upconverting Nanoparticles for Biophotonic Applications**
A. DE CAMARGO, São Carlos Institute of Physics, University of São Paulo, São Carlos, SP, Brazil

FH - 4th International Conference
EMERGING MATERIALS, TECHNOLOGIES AND APPLICATIONS FOR NON-VOLATILE MEMORY AND MEMRISTIVE DEVICES

Session FH-1.1
Phase Change Memories (PCM): materials, devices and applications

FH-1.1:IL01 **Two-dimensional Chalcogenides for Advanced Memory Applications**
A.V. KOLOBOV[1,2], P. FONS[2], Y. SAITO[2], J. TOMINAGA[2], [1]Herzen University, St. Petersburg, Russia; [2]AIST, Japan

FH-1.1:L02 **New Insight into the Origin of the Resistive Switching Mechanism and the Low Power Consumption of GeTe/Sb2Te3 Superlattices in Phase-change Memory Devices**
D. TEREBENEC[1], N. CASTELLANI[1], N. BERNIER[1], V. SEVER[1], P. KOWALCZYK[1], M. BERNARD[1], M.-C. CYRILLE[1], N.-P. TRAN[1], J.-Y. RATY[1,2], F. D'ACAPITO[3], F. HIPPERT[4], P. NOÉ[1], [1]Université Grenoble Alpes, CEA, LETI, Grenoble, France; [2]CESAM-Physics of Solids Interfaces and Nanostructures, B5, Université de Liège, Belgium; [3]CNR-IOM-OGG c/o ESRF - The European Synchrotron, Grenoble, France; [4]Université Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France

FH-1.1:L03 **Analysis of Ge-incorporation and Crystallization Study in GexSbyTez Phase Change Alloys for Automotive Applications**
A. DIAZ FATTORINI, F. DE NICOLA, M. BERTELLI, S. DE SIMONE, V. MUSSI, R. CALARCO, **M. LONGO**, CNR-IMM Unit of Rome, Rome, Italy

FH-1.1:L04 **Electronic Properties of Phase Change Material Heterostructures based on Ge-rich Ge-Sb-Te Alloys**
F. RIGHI RIVA[1], C. CHÈZE[1], E. PLACIDI[2], G. DI BELLA[2], S. PRILI[1], A. DIAZ FATTORINI[3], S. CECCHI[4], V. MUSSI[3], S. DE SIMONE[3], M. LONGO[3], R. CALARCO[3], M. BERNASCONI[5], O. ABOU EL KHEIR[5], F. ARCIPRETE[1], [1]Department of Physics, University of Rome Tor Vergata, Roma, Italy; [2]Department of Physics, Sapienza University of Rome, Rome, Italy; [3]CNR Institute for Microelectronics and Microsystems-IMM, Consiglio Nazionale delle Ricerche, Roma, Italy; [4]Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; [5]Department of Materials Science, University of Milano-Bicocca, Milan, Italy

FH-1.1:L05 **The Role of (dis)Order on the Structural-electronic Interplay in Amporphous GexSe1-x: A Microscopic Investigation**
F. TAVANTI, A. SLASSI, **A. CALZOLARI**, CNR-NANO Istituto Nanoscienze, Modena, Italy

FH-1.1:L06 **Selective MOCVD Growth of Sb-Te and In-Ge-Te Nanostructures on Templated Substrates for Phase Change Memories**
R. CECCHINI[1,2], M. LONGO[1,3], C. MARTELLA[1], A. LAMPERTI[1], S. BRIVIO[1], F. ROSSI[4], L. LAZZARINI[4], E. VARESI[5], [1]CNR-IMM, Unit of Agrate Brianza, Agrate Brianza (MB), Italy; [2]CNR-IMM, Bologna, Italy; [3]CNR-IMM, Rome, Italy; [4]CNR-IMEM, Parma, Italy; [5]Micron Technology Inc., Vimercate (MB), Italy

FH-1.1:L07 **Shape Controlled Self-assembly of Core Shell Ge-Sb-Te/Sb2Te3 Nanowires by MOCVD**
A. KUMAR, **C. WIEMER**, CNR-IMM Unit of Agrate Brianza, Agrate Brianza, Italy; R. CECCHINI. CNR-IMM Unit of Bologna, Bologna, Italy; M. SCUDERI, G. NICOTRA, CNR-IMM Unit of Catania, Catania, Italy; V. MUSSI, S.D. SIMONE, R. CALARCO, M. LONGO, CNR-IMM Unit of Rome, Rome, Italy

FH-1.1:L08 **Femtosecond Laser Modification of GST225 Amorphous Thin Films: Crystallization and LIPSS Formation**
S. KOZYUKHIN, T. KUNKEL, Kurnakov Institute of General and Inorganic Chemistry, RAS, Moscow, Russia; P. LAZARENKO, National Research University of Electronic Technology, Zelenograd, Russia; M. SMAYEV, Mendeleev University of Chemical Technology of Russia, Moscow, Russia; YU. VOROBYEV, Ryazan State Radio Engineering University, Ryazan, Russia

FH-1.1:IL09 **Deep Learning Inference and Training using Computational Phase-change Memory**
M. LE GALLO, A. SEBASTIAN, IBM Research Europe, Rueschlikon, Switzerland

FH-1.1:IL10 **Chalcogenide Materials for Innovative Phase-Change Memories, Ovonic Threshold Switching Selectors and Photonic Devices**
P. NOE[1], M. TOMELLERI[1,2], D. TÉRÉBENEC[1], A. ALBANESE[1], J. PATERSON[1], A. VERDY[1], J.-B. DORY[1], J.-B. JAGER[3], V. M. GIORDANO[4], D. BENOIT[2], F. D'ACAPITO[5], B. CLUZEL[6], F. HIPPERT[7], J.-Y. RATY[1,8], [1]Univ. Grenoble Alpes, CEA, LETI, MINATEC campus, Grenoble, France; [2]STMicroelectronics, Crolles, France; [3]Univ. Grenoble Alpes, CEA, IRIG, MINATEC campus, Grenoble, France; [4]ILM, UMR 5306 Univ. Lyon 1-CNRS, Villeurbanne Cedex, France; [5]CNR-IOM-OGG c/o ESRF – The European Synchrotron, Grenoble, France; [6]ICB, UMR CNRS 6303, Université Bourgogne Franche-Comté, Dijon cedex, France; [7]Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; [8]CESAM-Physics of Solids Interfaces and Nanostructures, B5, Université de Liège, Belgium

FH-1.1:L11 **C-based Phase-change Material Nanocomposites for Improved Phase-change Memory**
J. PATERSON[1], M. TOMELLERI[1,2], D.TÉRÉBENEC[1], R.R. CHAHINE[1], M. BERNARD[1], N. BERNIER[1], N. CASTELLANI[1], M.-C. CYRILLE[1], N.-P. TRAN[1], R. CRAVERO[3], O. BOURGEOIS[3], V.M. GIORDANO[4], J.-Y. RATY[1,5], F. D'ACAPITO[6], D. BENOIT[2], F. HIPPERT[7], P. NOÉ[1], [1]Univ. Grenoble Alpes, CEA, LETI, Grenoble, France; [2]STMicroelectronics, Crolles, France; [3]Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France; [4]ILM, UMR5306 Université Lyon 1-CNRS, Villeurbanne, France; [5]Physics of Solids Interfaces and Nanostructures, B5, Université de Liège, Sart-Tilman, Belgium; [6]CNR-IOM-OGG c/o ESRF - The European Synchrotron, Grenoble, France; [7]Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France

FH-1.1:L12 **Thermal Engineering Targeting Low Power Consumption for Next Generation Phase-change Memory**
C. DE CAMARET, Y. LE-FRIEC, STMicroelectronics, Crolles, France; G. BOURGEOIS, O. CUETO, V. MELI, V. BEUGIN, N. CASTELLANI, M.C. CYRILLE, F. ANDRIEU, J. ARCAMONE, G. NAVARRO, CEA-LETI, Grenoble, France

FH-1.1:L13 **Overcoming the Thermal Stability Limit of Chalcogenide Phase-change Materials for High-temperature Applications**
M. TOMELLERI[1,2], F. HIPPERT[3], A. ALBANESE[1], F. D'ACAPITO[4], T. FARJOT[1], C. SABBIONE[1], M. TESSAIRE[1], D. TEREBENEC[1], N. CASTELLANI[1], V.M. GIORDANO[5], D. BENOIT[2], P. NOÉ[1], [1]Univ. Grenoble Alpes, CEA, LETI, Grenoble, France; [2]STMicroelectronics, Crolles, France; [3]Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; [4]CNR-IOM-OGG c/o ESRF - The European Synchrotron, Grenoble, France; [5]ILM, UMR 5306 Univ. Lyon 1-CNRS, Villeurbanne, France

FH-1.1:L14 **A Novel Sb2Te3/Ge2Sb2Te5/Ge Heterostructure with Enhanced Stability for PCM Application**
A. DIAZ FATTORINI, F. DE NICOLA, M. BERTELLI, S. DE SIMONE, V. MUSSI, M. LONGO, **R. CALARCO**, CNR-IMM Unit of Rome, Rome, Italy; G. D'ARRIGO, I. LOPEZ GARCIA, G. MAIDA, S.M.S. PRIVITERA, CNR-IMM Headquarters, Catania, Italy; M. BORGHI, A. REDAELLI, STMicroelectronics, Agrate B.za (MB), Italy; M.-C. CYRILLE, CEA, LETI, Univ. Grenoble Alpes, Grenoble, France

Session FH-1.2
Resistance switching memories and advanced memristive devices

FH-1.2:IL01 **Memristors for Artificial Neural Networks: From Device Compact Modelling to Circuit and System Level Simulations**
F.L. AGUIRRE, Universitat Autònoma de Barcelona, Spain

FH-1.2:IL02 **Evaluation Framework Assessing Memristor Technologies for Neural Network Implementations**
G. BERSUKER, J. FARMER, M. LUENGO-KOVAC, D. VEKSLER, The Aerospace Corporation, Los Angeles, USA; D.Z. GAO, A.-M. EL-SAYED, T. DURRANT, A. SHLUGER, Nanolayers Research Computing LTD, London, UK; T. RUECKES, L. CLEVELAND, H. LUAN, R. SEN, Nantero Inc., Woburn, USA

FH-1.2:L03 **Resistive Switching in Sputtered MoS2 Memristive Devices**
A. LINKENHEIL[1,3], T. SCHELER[2,3], S. PARK[1,3], P. SCHAAF[2,3], F. SCHWIERZ[1], M. ZIEGLER[1,3], [1]Micro- and Nanoelectronic Systems, Department of Electrical Engineering and Information Technology, TU Ilmenau, Ilmenau, Germany; [2]Materials for Electrical Engineering and Electronics, Department of Electrical Engineering and Information Technology, TU Ilmenau, Ilmenau, Germany; [3]Institute of Micro- and Nanotechnologies MacroNano®, TU Ilmenau, Ilmenau, Germany

FH-1.2:L04 **Resistive Switching Behavior of Lateral TMDC Devices**
Z. GENG[1], C. ZHANG[1], S. PARK[1], C. ZIEBOLD[1], S. SHARMA[1], **F. SCHWIERZ**[1], K. ROSSNAGEL[2], M. ZIEGLER[1], [1]Micro- and Nanoelectronic Systems, Department of Electrical Engineering and Information Technology, Technische Universität Ilmenau, Germany; [2]Institute of Experimental and Applied Physics, Kiel University, Germany, and Ruprecht Haensel Laboratory, Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany

FH-1.2:L05 **Multiple Physical Time Scales in Few-nanometers Sized Graphene-SiOx-graphene Memristors**
L. PÓSA, Department of Physics, Budapest University of Technology and Economics and MTA-BME Condensed Matter Research Group, Budapest, Hungary, Institute for Technical Physics and Materials Science, Centre for Energy Research, Budapest, Hungary; T. TÖRÖK, G. FEHÉRVÁRI, Z. BALOGH, A. HALBRITTER, Department of Physics, Budapest University of Technology and Economics and MTA-BME Condensed Matter Research Group, Budapest, Hungary

FH-1.2:IL06 **The Role of Materials Design for the Transition from Digital to Analog Memories**
L. ALFF, Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany

FH-1.2:L07 **Oxygen Engineering in Yttrium Oxide-based RRAM Devices: Suppressed Noise, Digital-to-Analog Switching Transition and Conductance Quantization for NVM, Multibit and Neuromorphic Applications**
E. PIROS[1], S. PETZOLD[1], R. EILHARDT[2], A. ZINTLER[2], M. LONSKY[3], N. KAISER[1], T. VOGEL[1], E. JALAGUIER[4], E. NOLOT[4], C. CHARPIN[4], C. WENGER[5], J. MÜLLER[3], E. MIRANDA[6], L. MOLINA-LUNA[2], L. ALFF[1], [1]Advanced Thin Film Technology, Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany; [2]Institute of Physics, Goethe-University Frankfurt, Frankfurt am Main, Germany; [3]Advanced Electron Microscopy Division, Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany; [4]CEA, LETI, Grenoble, France; [5]IHP, Leibniz-Institut fuer innovative Mikroelektronik, Frankfurt (Oder), Germany; [6]Departament d'Enginyeria Electrònica, Universitat Autònoma de Barcelona, Cerdanyola del Valles, Barcelona, Spain

FH-1.2:L08 **Substoichiometric Hafnium Oxide Polymorphs with Semiconducting Properties**
N. KAISER[1], T. VOGEL[1], A. ZINTLER[2], S. PETZOLD[1], A. ARZUMANOV[1], E. PIROS[1], R. EILHARDT[2], L. MOLINA-LUNA[2], L. ALFF[1], [1]Advanced Thin Film Technology Division, Institute of Materials Science, TU Darmstadt, Darmstadt, Germany; [2]Advanced Electron Microscopy Division, Institute of Materials Science, TU Darmstadt, Darmstadt, Germany

FH-1.2:L09 **Statistical Evaluation of Tailored Memristive Characteristics in TiOx-HfOx Bilayer System**
S. PARK, **C. ZIEBOLD**, S. KLETT, T. IVANOV, M. ZIEGLER, Department of Electrical Engineering and Information Technology, & Institute of Micro and Nanotechnologies MacroNano, TU Ilmenau, Germany

FH-1.2:L10 **Improving Functional Properties of Embedded Ta/TaOx/Pt Based Resistive Memory Devices via Nanopatterning of Bottom Electrode**
M. ZHUK, A. CHOUPRIK, D. KUZMICHEV, A. ZENKEVICH, Moscow Institute of Physics and Technology (National Research University), Dolgoprudny, Moscow region, Russia

FH-1.2:L11 **Selective Activation of Memristive Interfaces in TaOx-based Devices by Controlling Oxygen Vacancies Dynamics at the Nanoscale**
M.J. SÁNCHEZ[1], C. FERREYRA[2], M. AGUIRRE[3,4,5], C. ACHA[6], S. BENGIÓ[2], J. LECOURT[7], U. LUDERS[7], D. RUBI[2], [1]INN-Centro Atómico Bariloche and Instituto Balseiro, San Carlos de Bariloche, Argentina; [2]GlyA and INN-CONICET, CNEA, San Martín, Buenos Aires, Argentina.2INN-CONICET; [3]Depto de Fíisica de Materia Condensada, Universidad de Zaragoza, Zaragoza, Spain; [4]Lab. de Microscopías Avanzada (LMA), Instituto de Nanociencia de Aragón (INA)-Universidad de Zaragoza, Zaragoza, Spain; [5]Instituto de Ciencias de Materiales de Aragón (ICMA), Universidad de Zaragoza, Zaragoza, Spain; [6]Depto. de Física, FCEyN, Universidad de Buenos Aires and IFIBA,UBA-CONICET, Pab I, Ciudad Universitaria, Buenos Aires, Argentina.; [7]CRISMAT, CNRS UMR 6508, ENSICAEN, Caen, France

FH-1.2:L12 **Investigation of the Ultrafast Resistive Switching**
B. SANTA, D. MOLNÁR, A. HALBRITTER, Budapest University of Technology and Economics and MTA-BME Condensed Matter Research Group, Budapest, Hungary; M. CSONTOS, Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland

FH-1.2:IL13 **Oxide ReRAM Technology NVM Solution**
A. REGEV, Weebit-nano, Hod Hasharon, Israel

FH-1.2:IL14 **Structural Changes and Conductive Filament Formation in Silicon Oxide during Resistance Switching**
A.J. KENYON[1], A. MEHONIC[1], M. BUCKWELL[1], L. MONTESI[1], M. SINGH MUNDE[1,2], D. GAO[3], S. HUDZIAK[1], R.J CHATER[4], S. FEARN[4], D. MCPHAIL[4], M. BOSMAN[2], A.L. SHLUGER[3], [1]Department of Electronic & Electrical Engineering, UCL, London, UK; [2]Institute of Materials Research and Engineering, Singapore; [3]Department of Physics and Astronomy and London Centre for Nanotechnology, University College London, London, UK; [4]Department of Materials, Imperial College London, South Kensington Campus, London, UK

FH-1.2:IL15 **Prospects and Challenges of Area-dependent Memristive Devices for Neuromorphic Computing**
R. DITTMANN, Peter-Grünberg-Institute (PGI-7), Research Center Jülich, Jülich, Germany

FH-1.2:L16 **Memristor-based Artificial Neural Network (ANN) Hardware based on Flexible Semiconducting Technology**
A. KIAZADEH, J. DEUERMEIER, M. PEREIRA, R. MARTINS, E. FORTUNATO, i3N/CENIMAT, Department of Materials Science, NOVA School of Science and Technology, Universidade NOVA de Lisboa and CEMOP/UNINOVA, Campus de Caparica, Portugal

FH-1.2:L17 **Advanced Analysis of Current Noise in SiOx-based Phase-change Memories**
Z. BALOGH, A. HALBRITTER, Dept. of Physics, Budapest University of Technology and Economics, and MTA-BME Condensed Matter Research Group, Budapest, Hungary; P. BALÁZS, D. KRISZTIÁN, G. FEHÉRVÁRI, Dept. of Physics, Budapest University of Technology and Economics, Budapest, Hungary; L. PÓSA, Dept. of Physics, Budapest University of Technology and Economics, Budapest, Hungary and Institute for Technical Physics and Materials Science, Centre for Energy Research, Hungarian Academy of Sciences, Budapest, Hungary

FH-1.2:IL18 **Reliability of Redox-based Memristive Elements**
R. WASER[1,2], D. WOUTERS[1], S. MENZEL[2], [1]JARA-FIT & IWE2, RWTH Aachen University, Aachen, Germany; [2]JARA-FIT & PGI-7/-10, Forschungszentrum Jülich, Jülich, Germany

FH-1.2:IL19 **Analog Behavior in Programmable Metallization Cell Devices**
N. CHAMELE, M. BALABAN, A. RICKS, Y. GONZALEZ VELO, **M.N. KOZICKI**, School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, USA

FH-1.2:L20 **Influence of Different SiO2 Matrices on the Properties of Cu/SiO2/W Devices**
F. MAUDET[1], H. AMARI[2], D. MARLINA[1,3], V. DESHPANDE[1], C. DUBOURDIEU[1,3], [1]Institute Functional Oxides for Energy-Efficient Information Technology (QM-IFOX), Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; [2]Leibniz-Institut für Kristallzüchtung (IKZ), Berlin, Germany; [3]Freie Universität Berlin, Physical Chemistry, Berlin Germany

FH-1.2:IL21 **Radiation Effects on ReRAM/CBRAM Technology**
Y. GONZALEZ VELO, M.N. KOZICKI, School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, USA

FH-1.2:L22 **Swift Heavy Ion Irradiation Induced Effects on Emerging Memories - Correlation of Structural and Electrical Properties**
T. VOGEL[1], T. KÄMPFE[2], A.L. SERRA[3], N. KAISER[1], M. LEDERER[2], G. LEFÈVRE[3], N. GUILLAUME[3], R. OLIVO[2], T. ALI[2], D. LEHNINGER[2], E. PIROS[1], G. NAVARRO[3], C. CHARPIN-NICOLLE[3], S. PETZOLD[1], C. TRAUTMANN[4], L. ALFF[1], [1]Advanced Thin Film Technology Division, Institute of Materials Science, TU Darmstadt, Darmstadt, Germany; [2]Fraunhofer IPMS, Dresden, Germany; [3]CEA LETI, Grenoble, France; [4]GSI Helmholtzzentrum, Darmstadt, Germany & Institute of Materials Science, TU Darmstadt, Darmstadt, Germany

FH-1.2:L23 **Quantum Transport Phenomena in Transition Metal Oxide Memristors**
T.N. TÖRÖK, P. MAKK, A. HALBRITTER, Department of Physics, Budapest University of Technology and Economics, Budapest, Hungary; M. CSONTOS, Empa, Swiss Federal Laboratories for Materials Science and Technology, Transport at Nanoscale Interfaces Laboratory, Switzerland

Session FH-2

Magnetic and ferroelectric memories: materials, devices and applications

FH-2:IL01 **Magneto-ionics: using Ionic Motion to Control Magnetism in Spintronics Devices**
L. HERRERA DIEZ, CNRS - Université Paris-Saclay, Palaiseau, France

FH-2:IL02 **A Multifunctional Standardized Magnetic Tunnel Junction Stack Embedding Sensor, Memory and Oscillator Functionalities**
I.L. PREJBEANU[1], A. CHAVENT[1], V. IURCHUK[1], L.TILLIE[1], Y. BEL[1], N. LAMARD[1], L. VILA[1], U. EBELS[1], R.C. SOUSA[1], B. DIENY[1], G. DI PENDINA[1], G. PRENAT[1], J. LANGER[2], J. WRONA[2], [1]Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP*, IRIG-Spintec, Grenoble, France, *Institute of Engineering, Univ. Grenoble Alpes; [2]Singulus Technologies AG, Kahl am Main, Germany

FH-2:IL03 **New Insight of Degradation and TDDB of Super-thin MgO in STT-MRAM**
KIN-LEONG PEY, J.H. LIM, N. RAGHAVAN, Singapore University of Technology and Design, Singapore

FH-2:L04 **A High-coercivity Non-volatile Thin-film Magnet based on the Shell-FM Effect**
A. ÇAKIR, Department of Metallurgical and Materials Engineering, Mugla University, Mugla, Turkey; M. ACET, M. FARLE, Physics, Duisburg-Essen University, Duisburg, Germany

FH-2:IL05 **In-memory Computing with Ferroelectric Germanium Telluride**
C. RINALDI, L. NESSI, F. FAGIANI, M. CANTONI, R. BERTACCO, Politecnico di Milano, Milano, Italy; S. VAROTTO, M. BIBES, CNRS, Thales, Palaiseau, France; S. CECCHI, Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; R. CALARCO, CNR-IMM, Roma, Italy; J. SŁAWINSKA, University of Groningen, Groningen, Netherlands; M. BUONGIORNO NARDELLI, University of North Texas, Denton, TX, USA; S. PICOZZI, CNR-SPIN, Chieti, Italy; P. NOËL, J.-P. ATTANÉ, L. VILA, Université Grenoble Alpes, CEA, CNRS, Grenoble, France

FH-2:IL06 **Resistive Switching in Ferroelectric Perovskites**
I. FINA, Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus UAB, Bellaterra, Catalonia, Barcelona, Spain

FH-2:IL07 **Hafnia-based Ferroelectric Devices: A Singular Type of Switching**
P. NUKALA[1, 2], D. CARBONE[3], M. AHMADI[1], Y. WEI[1, 4], S. MATZEN[5], **B. NOHEDA**[1, 6], [1]Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands; [2]Center for Nanoscience and Engineering, Indian Institute of Science, Bengaluru, India; [3]MAX IV Laboratory, Lund University, Lund, Sweden; [4]Nanoelectronic Devices Laboratory (NANOLAB), École Polytechnique Fédérale de Lausanne, EPFL, Lausanne, Switzerland; [5]Center for Nanoscience and Nanotechnology, University Paris-Saclay, CNRS, Palaiseau, France; [6]CogniGron Centre, University of Groningen, Groningen, The Netherlands

FH-2:IL08 **Fluid Imprint in Ferroelectric La:HfO2 Capacitors**
A. GRUVERMAN[1], P. BURAGOHAIN[1], A. ERICKSON[2], T. MITTMANN[3], P. KARIUKI[3], C. RICHTER[3], T. SCHENK[4], T. MIKOLAJICK[3], U. SCHROEDER[3], [1]Dept. of Physics and Astronomy, University of Nebraska, Lincoln, NE, USA; [2]Dept. of Mechanical and Materials Engineering, University of Nebraska, Lincoln, NE, USA; [3]NaMLab gGmbH/TU Dresden, Dresden, Germany; [4]Materials Research and Technology Department, Luxembourg Institute of Science and Technology, Belvaux, Luxembourg

FH-2:L09 **HZO FTJ Analog NVM with Synaptic Plasticity**
N. SIANNAS, C. ZACHARAKI, P. TSIPAS, **A. DIMOULAS**, NCSR DEMOKRITOS, Athens, Greece

FH-2:L10 **Flexible HfO2-based Ferroelectric Tunnel Memristor on Mica**
I. MARGOLIN, A. CHOUPRIK, R. KIRTAEV, E. KOROSTYLEV, V. MIKHEEV, E. GUBERNA, D. NEGROV, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia

FH-2:L11 **Ferroelectric Devices on CAAC-OSLSI**
S. NUMATA, Y. EGI, F. ISAKA, Y. JIMBO, T. HAMADA, H. BABA, K. OHSHIMA, T. MURAKAWA, S. TEZUKA, H. KUNITAKE, S. YAMAZAKI, Semiconductor Energy Laboratory, Co, Ltd., Atsugi-shi, Kanagawa, Japan

FH-2:L12 **Evaluation of Ferroelectric Memory using CAAC-OSLSI Technology**
K. OHSHIMA, K. FURUTANI, T. MATSUZAKI, K. TSUDA, S. NUMATA, F. ISAKA, Y. JIMBO, H. KUNITAKE, T. ONUKI, S. YAMAZAKI, Semiconductor Energy Laboratory Co., Ltd., Atsugi-shi, Kanagawa, Japan

Session FH-3

Emerging applications for non-volatile memories and memristive devices

FH-3:IL01 **Ferroelectric Memories for Neuromorphic Computing**
S. SLESAZECK, NaMLab gGmbH, Dresden, Germany

FH-3:IL02 **Photonic-spintronic Neuromorphic Computing Systems**
F. MORADI, H. FARKHANI, J. PELLOUX-PRAYER, Aarhus University, Aarhus, Denmark

FH-3:IL03 **Spintronic Devices for Neuromorphic and Probabilistic Computing**
SHUNSUKE FUKAMI, Research Institute of Electrical Communication, Tohoku University, Sendai, Japan

FH-3:IL04 **Organic Spintronic Multilevel Resistive Switching Devices as Synapses for Neuromorphic Computing**
A. RIMINUCCI, CNR-ISMN, Bologna, Italy

FH-3:L05 **Spin-computing Devices for Edge Artificial Intelligence**
R. BERTACCO, Dipartimento di Fisica, Politecnico di Milano, Milano, Italy

FH-3:IL06 **Memory-based Neuromorphic Hardware for Advanced Neural Network Models**
D.B. STRUKOV, University of California Santa Barbara, Santa Barbara, CA, USA

FH-3:IL07 **Neuromorphic Computing with Redox-based Memristive Elements - Capacitive and Resistive Concepts**
T. ZIEGLER, D.J. WOUTERS, R. WASER, JARA-FIT and IWE2, RWTH Aachen University, Aachen, Germany; S. MENZEL, R. WASER, JARA-FIT and PGI-7/-10, Forschungszentrum Jülich GmbH, Jülich, Germany

FH-3:L08 **Nonlinear Dynamics of Chua's Circuits with Physical Memristor Model**
F. CORINTO, Politecnico di Torino, Torino, Italy; M. DI MARCO, M. FORTI, R. MORETTI, L. PANCIONI, University of Siena, Siena, Italy

FH-3:L09 **Resistive Switching-based Invariant Manifold Tunable Chua's Circuit Design**
M. ESCUDERO[1], L. PANCIONI[2], S. SPIGA[1], S. BRIVIO[1], [1]CNR-IMM, Unit of Agrate Brianza, Agrate Brianza, Italy; [2]Università degli Studi di Siena, Siena, Italy

FH-3:L10 **Storing and Retrieving Data in Mem-Processors**
A. ASCOLI[1], R. TETZLAFF[1], I. MESSARIS[1], S.-M. KANG[2], L.O. CHUA[3], [1]Faculty of Electrical and Computer Engineering, Technische Universitat Dresden, Dresden, Germany; [2]Jack Baskin School of Engineering, University of California Santa Cruz, Santa Cruz, CA, USA; [3]Dept. of Electrical Engineering and Computer Sciences, University of California Berkeley, Berkeley, CA, USA

FH-3:L11 **Autonomous Decision Making in Noisy Environment**
D. MOLNAR, T.N. TÖRÖK, L. PÓSA, A. HALBRITTER, Department of Physics, Budapest University of Technology and Economics and MTA-BME Condensed Matter Research Group, Budapest, Hungary

FH-1:IL12 **From Resistive Switching in Mott Insulators to Mott Memory and Artificial Neuron**
E. JANOD, B. CORRAZE, J. TRANCHANT, L. CARIO, **M.-P. BESLAND**, Nantes University, UMR CNRS, Institut des Matériaux Jean Rouxel (IMN), Nantes, France

FH-3:IL13 **VO2 Metal-insulator Devices for Energy Efficient Neuromorphic Computing**
S. KARG, E. CORTI, O. MAHER, IBM Research, Zurich, Switzerland

FH-3:L14 **Innovative V2O3:Cr Mott Insulator-based Resistive Memory**
L. LABORIE, N. CASTELLANI, G. BOURGEOIS, C. CASTELLANA, T. MAGIS, E. NOWAK, G. MOLAS, E. JALAGUIER, CEA, LETI, Univ. Grenoble Alpes, Grenoble, France; G. LEFEVRE, S. DAVID, C. VALLÉE, Univ. Grenoble Alpes, CNRS, CEA-LETI Minatec, LTM, Grenoble, France; J. TRANCHANT, B. CORRAZE, M.-P. BESLAND, E. JANOD, L. CARIO, Université de Nantes, CNRS, Institut des Matériaux Jean Rouxel, IMN, Nantes, France

FH-3:L15 **Silicon-integrated La2NiO4+δ-Based Valence-change Memristive Devices with Neuromorphic Programming Capabilities**
KHANH KHUU, C. JIMENEZ, M. BURRIEL, Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; G. LEFÈVRE, A. BSIESY, Univ. Grenoble Alpes, CNRS, CEA/LETI Minatec, LTM, Grenoble, France; S. BLONKOWSKI, E. JALAGUIER, Univ. Grenoble Alpes, CEA, LETI, Grenoble, France

FH-3:IL16 **Oscillator Computing based on Memristive Devices**
C. Lenk, L. Seeber, S. Durstewitz, S. Park, T. Ivanov, **M. ZIEGLER**, Micro- and Nanoelectronic Systems, Electrical Engineering and Information Technology, Ilmenau University of Technology, Ilmenau, Germany

FH-3:L17 **Implementation of an Electrical Set-up to enable RRAM-based Neural Network Operations**
E. PEREZ-BOSCH QUESADA, E. PEREZ, M. KALISHETTYHALLI MAHADEVAIAH, C.A. CHAVARIN, C. WENGER, IHP-Leibniz-Institut für innovative Mikroelektronik, Frankfurt (Oder), Germany; F. ZAHARI, H. KOHLSTEDT, Nanoelectronic, Faculty of Engineering, Kiel University, Kiel, Germany; M. ZIEGLER, Department of Micro- and Nanoelectronic Systems, TU Ilmenau, Ilmenau, Germany; C. WENGER, BTU Cottbus-Senftenberg, Cottbus, Germany

FH-3:IL18 **Nanowire based Memristive Devices**
G. MILANO, **C. RICCIARDI**, Advanced Materials Metrology and Life Science Division, INRiM (Istituto Nazionale di Ricerca Metrologica), Torino, Italy; Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy

FH-3:L19 **A Graph Theory-based Approach for Memristive Nanowire Networks**
G. MILANO[1], K. MONTANO[2], E. MIRANDA[3], C. RICCIARDI[2], [1]Advanced Materials Metrology and Life Science Division, INRiM (Istituto Nazionale di Ricerca Metrologica), Torino, Italy; [2]Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy; [3]Departament d'Enginyeria Electrònica, Universitat Autònoma de Barcelona (UAB), Cerdanyola del Valles, Spain

FH-3:L20 **Long-term Probing of Memristive Ag-based Nanostructures via an Unconventional cAFM Approach**
N. CARSTEN, R. GUPTA, T. STRUNSKUS, F. FAUPEL, A. VAHL, Institute for Materials Science, Chair for Multicomponent Materials, Kiel University, Kiel, Germany; A. HASSANIEN, Department of Condensed Matter Physics, J. Stefan Institut, Ljubljana, Slovenia

FH-3:L21 **Resistive Switching in Nanoparticle-based Systems: From Diffusive Switching towards Collective Dynamics**
N. CARSTENS[1], B. ADEJUBE[1], M. NOLL[2], T. BIRKOBEN[2], M. MIRIGLIANO[3], R. GUPTA[1], T. STRUNSKUS[1], F. FAUPEL[1], P. MILANI[3], H. KOHLSTEDT[2], **A. VAHL**[1], [1]Institute for Materials Science - Chair for Multicomponent Materials, Faculty of Engineering, Kiel University, Kiel, Germany; [2]Institute for Electrical Engineering and Information Engineering - Chair for Nanoelectronics, Faculty of Engineering, Kiel University, Kiel, Germany; [3]Dipartimento di Fisica & Cimaina, Universita degli Studi di Milano, Milano, Italy

FH-3:L22 **Correlation between the Threshold Kinetics and Relaxation Behavior of Ag/HfO2-based Diffusive Memristors**
S.A. CHEKOL, S. MENZEL, R. WASER, S. HOFFMANN-EIFERT; W.R. AHMAD, R. WASER, JARA-FIT and Peter Gruenberg Institute (PGI 7 & 10), Forschungszentrum Juelich GmbH, Juelich, Germany; JARA-FIT and Institute of Materials in Electrical Engineering and Information Technology II, RWTH Aachen University, Aachen, Germany

FH-3:L23 **Short Time Dynamics in SiO2 and HfO2-based Threshold Switching Devices**
M. DUTTA, S. BRIVIO, M. ALIA, S. SPIGA, CNR-IMM, Unit of Agrate Brianza, Agrate Brianza, Italy

FH-3:L24 **Voltage-time Dilemma of Current-driven Silver Single-atom Resistive Switches**
A. NYARY, B. SÁNTA, A. HALBRITTER, Budapest University of Technology and Economics, MTA-BME Condensed Matter Research Group, Budapest, Hungary

FH-3:IL25 **Physic Based Simulation of ReRAM for Neural Network Applications**
S. MENZEL, Forschungszentrum Jülich, Peter Grünberg Institut (PGI-7), Jülich, Germany

FH-3:IL26 **Energy Efficient Neuromorphic Computing using Resistive Switching Memories**
M. MARINELLA, S. AGARWAL, C. BENNETT, P. XIAO, R. JACOBS-GEDRIM, D. HUGHART, E. FULLER, A. TALIN, Sandia National Laboratories, Albuquerque, NM. USA

FH-3:L27 **Impact of Memristive Switching Dynamics on Spiking Neural Network Operation**
S. BRIVIO, S. SPIGA, CNR-IMM, Unit of Agrate Brianza, Agrate Brianza, Italy; D.R.B. LY, E. VIANELLO, Université Grenoble Alpes, Leti, Grenoble, France

FH-3:L28 **Modelling the Switching of RRAM Devices for Bio-inspired Computing**
F. VACCARO, S. BRIVIO, S. SPIGA, CNR-IMM, Unit of Agrate Brianza, Agrate Brianza, Italy; S. PEROTTO, Dipartimento di Matematica, Politecnico di Milano, Milano, Italy; A.G. MAURI

FH-3:L29 **A Comprehensive Stochastic Modeling for the Effect of Cu Ions and Oxygen Vacancies in Cu/ZnO/Pt RRAM**
KUAN YANG, Mathematical Institute, University of Oxford & Cuiying Honors College, Lanzhou University; S. ZHOU, School of Arts, Lanzhou University; J. CHEN, School of Mechanical Engineering, University of Leeds, Leeds, UK; J. HU, J. QI, Key Laboratory of Special Function Materials and Structure Design, Ministry of Education, School of Physical Science and Technology, Lanzhou University, Lanzhou, China

FH-3:L30 **1/f Noise Spectroscopy and Noise Tailoring of Resistive Switching Devices**
A. HALBRITTER, Z. BALOGH, B. SÁNTA, L. PÓSA, T.N. TÖRÖK, D. MOLNÁR, Department of Physics and MTA-BME Condensed Matter Research Group, Budapest University of Technology and Economics, Budapest, Hungary; M. CSONTOS, Transport at Nanoscale Interfaces Laboratory, Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland

FH-3:L31 **A Metal-Oxide-Based Memristor for Artificial Synapse**
N. RAEIS-HOSSEINI, C. PAPAVASSILIOU, Imperial College London, London, UK

SYMPOSIUM FI

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

Session FI-1

General physical and chemical properties, structural and electronic characterization of graphene, graphene oxide and of single and few-layered 2D compounds

FI-1:IL01 **Nanometer-scale Characterization and Control of Two-dimensional Materials with Atomic Force Microscopy**
M.R. ROSENBERGER, University of Notre Dame, Notre Dame, IN, USA

FI-1:IL02 **Two-dimensional Topological Polymers**
T.-J. LIU, M. SPRINGER, A. KUC, Y. JING, **T. HEINE**, TU Dresden, Dresden, Germany

FI-1:IL03 **In situ Transmission Electron Microscopy of 2D Nanomaterials**
D.V. GOLBERG, Queensland University of Technology (QLD), Brisbane, Australia

FI-1:IL04 **Quantum Hall Effect in Graphite Films**
A. MISHCHENKO, Department of Physics and Astronomy, The University of Manchester, Manchester, UK

FI-1:IL05 **Advances in Organic 2D Crystals**
XINLIANG FENG, Center for Advancing Electronics Dresden & Faculty of Chemistry and Food Chemistry, Technische Universitaet Dresden, Germany

FI-1:IL06 **2D MXene Organic Dispersions and their Electronic Applications**
CHONG MIN KOO, Materials Architecturing Research Center, Korea Institute of Science and Technology, Seoul, South Korea

FI-1:L07 **Mechanical Strain in Silicene Membranes**
C. MASSETTI[2], C. MARTELLA[1], D.S. DHUNGANA[1], C. GRAZIANETTI[1], A. MOLLE[1], E. BONERA[2], [1]CNR-IMM Agrate Brianza unit, Agrate Brianza (MB), Italy; [2]Università Milano-Bicocca, Milano, Italy

FI-1:L08 **Electronic Properties in MOCVD Mono- and Bilayer MoS2 on CVD Single-layer Graphene on Alpha-Al2O3 (0001) at Atomic Resolution**
H. WÖRDENWEBER[1, 2], S. KARTHÄUSER[1], A. GRUNDMANN[3], Z. WANG[1, 2], H. KALISCH[3], A. VESCAN[3], M. HEUKEN[3, 4], R. WASER[1, 2], S. HOFFMANN-EIFERT[1], [1]Peter Grünberg Institute 7&10, Forschungszentrum Jülich GmbH and JARA-FIT, Jülich, Germany; [2]RWTH Aachen University, Aachen, Germany; [3]Compound Semiconductor Technology, RWTH Aachen University, Aachen, Germany; [4]AIXTRON SE, Herzogenrath, Germany

FI-1:L09 **New Way of Conceiving the Structure of Graphene**
J. NIEWIADOMSKA-KAPLAR, Scientific Publishing House Tab, Rome, Italy

Session FI-2

Novel properties including spin, spin-orbit, magnetic, superconducting, thermal, thermoelectric, piezoelectric, excitonic, catalysis-related etc.

FI-2:IL01 **Synthesis and Novel Properties of 2D Layered Semiconductors and their Heterostructures**
WEN-HAO CHANG, Department of Electrophysics, National Chiao Tung Unversity, Hsinchu, Taiwan

FI-2:IL02 **Mechanical Properties of Graphene and 2D Material Reinforcements in Composites**
I.A. KINLOCH, Dept. of Materials and National Graphene Institute, University of Manchester, Manchester, UK

FI-2:L03 **A Place where Everyone Matters – Interfaces in 2D Functional Nanostructures**
M. BAR SADAN, Ben Gurion University, Beer Sheva, Israel

FI-2:IL04 **Revisiting the Buckling Metrology Method to Determine the Young's Modulus of 2D Materials**
R. FRISENDA, A. CASTELLANOS GOMEZ, Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Madrid, Spain

FI-2:IL05 **Ferroelectric Domains and Networks of Piezoelectric Domains in Twistronic Bilayers of Transition Metal Dichalcogenides (TMD)**
V. FALKO, National Graphene Institute, University of Manchester, Manchester, UK

FI-2:L06 **Phase Transition and Catalytic Activity toward Hydrogen Evolution Reaction of Mo1−xM'xSe2 Alloy Nanosheets**
T.T. DEBELA, **HONG SEOK KANG**, Institute for Application of Advanced Materials, Jeonju University, South Korea; Department of Nano & Advanced Materials, Jeonju University, South Korea

FI-2:IL07 **Functionalizing 2D-layered Nanomaterials for Artificial Photosynthesis: Turning CO2 into a Valuable Resource**
LI-CHYONG CHEN[1,2], I. SHOWN[3], YI-FAN HUANG[3], HE-YUN DU[1,2], HSIANG-TING LIEN[1,2], YU-CHUNG CHANG[1], KUEI-HSIEN CHEN[1,3], [1]Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; [2]Center of Atomic Initiative for New Materials, National Taiwan University, Taipei, Taiwan; [3]Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan

FI-2:IL08 **Josephson Junctions for Digital Applications**
P. FEBVRE, Université Savoie Mont Blanc, Le Bourget du Lac, France

FI-2:L09 **2D Materials Beyond Graphene**
Y. GOGOTSI, C.E. SHUCK, A.J. Drexel Nanomaterials Institute, Drexel University, Philadelphia, PA, USA

Session FI-3

Synthesis, processing and microstructure of graphene and other 2D layered compounds and their composites

FI-3:IL01 **The Xene Generations: Details, Methods and Perspectives of Epitaxial Single-element Two-dimensional Materials**
A. MOLLE, CNR-IMM, unit of Agrate Brianza, Agrate Brianza, Italy

FI-3:IL02 **Synthetic Route Towards Pure Phase of WS2 & MoS2 Inorganic Nanotubes and their Unusual Properties**
A. ZAK, S. GHOSH, C. PALLELLAPPA, HIT-Holon Institute of Technology, Holon, Israel; T. LIVNEH, Nuclear Research Center, Negev, Israel; I. KAPLAN-ASHIRI, Weizmann Institute of Science, Israel; Y. ZHANG, Max Planck Institute for Solid State Research, Stuttgart, Germany; Y. IWASA, The University of Tokyo, Japan; V. BRUSER, Leibnitz Institute of Plasma, Germany; A. DI BARTOLOMEO, University of Salerno, Italy

FI-3:IL03 **Boron Nitride Nanosheets from a New Source of Large hBN Single Crystals**
B. TOURY[1], C. MAESTRE[1, 2], V. GARNIER[2], P. STEYER[2], C. JOURNET[1], [1]Laboratoire des Multimatériaux et Interfaces, CNRS, UMR 5615, Université de Lyon, Villeurbanne, France; [2]Laboratoire Matériaux Ingénierie et Science, UMR CNRS 5510, INSA de Lyon, Villeurbanne, France

FI-3:IL04 **2D High-Entropy MXenes**
S.K. NEMANI, B. ZHANG, B.C. WYATT, **B. ANASORI**, Department of Mechanical and Energy Engineering, and Integrated Nanosystems Development Institute, Purdue School of Engineering and Technology, Indiana University-Purdue University Indianapolis, Indianapolis, IN, USA

FI-3:IL05 **2D Materials: Inorganic Nanotubes and Fullerene-like Nanoparticles, an Update**
R. TENNE, Weizmann Institute of Science, Rehovot, Israel

FI-3:L06 **Two-dimensional MXenes with 5 Atomic Layers of Transition Metals: Mo4VC4Tx and Beyond**
C.E. SHUCK, G. DEYSHER, K. HANTANASIRISAKUL, K. MALESKI, A. SARYCHEVA, B. ANASORI, Y. GOGOTSI, A.J. Drexel Nanomaterials Institute, Drexel University, Philadelphia, PA, USA; N.C. FREY, A. FOUCHER, V.B. SHENOY, E.A. STACH, Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA, USA

FI-3:IL07 **Thickness and Lateral Engineering of 2D Materials**
L. CAMILLI, Department of Physics, University of Rome "Tor Vergata", Rome, Italy

FI-3:L08 **Sustainable and Scalable Liquid-phase Exfoliation of Graphene-like Materials with Nontoxic Polarclean Solvent**
J. DE SANTIS[1], V. PAOLUCCI[1], G. DI IORIO[1], A. POLITANO[2], C. CANTALINI[1], [1]Department of Industrial and Information Engineering and Economics, University of L'Aquila, Italy; [2]Department of Physical and Chemical Sciences, University of L'Aquila, Italy

Session FI-4

Integration processes of graphene and other 2D layered materials in devices structures

FI-4:IL01 **Precise Synthesis of 2D Crystals for Energy Applications**
C. MATTEVI, Imperial College London, Department of Materials, London, UK

FI-4:IL02 **Graphene for Waveguide-integrated Optoelectronics**
C. COLETTI, Center for Nanotechnology Innovation @ NEST, Istituto Italiano di Tecnologia, Pisa, Italy; Graphene Labs, Istituto Italiano di Tecnologia, Genova, Italy

FI-4:IL03 **Integration Processes of Graphene-based Van der Waals Heterostructures and their Terahertz Device Applications**
J.A. DELGADO-NOTARIO, CENTERA Laboratories, Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland

FI-4:IL04 **Heteroassembly of Colloidal Graphene and Titania nanoseets and their Applications**
XINGKE CAI[1], Z. LU[2], Z. JIAN[3], R. MA[4], T. SASAKI[4], [1]Institute for Advanced Study, Shenzhen University, Shenzhen, Guangdong, China; [2]Shenzhen Institutes of Advanced Technology, CAS, Shenzhen, China; [3]Department of Materials Science and Engineering, Wuhan University of Technology, Wuhan, China; [4]International Center for Materials Nanoarchitectonics (WPI-MANA), National Institute for Materials Science (NIMS), Tsukuba, Ibaraki, Japan

Session FI-5

Novel characterizations routes

FI-5:IL01 **Modelling of WS2 Nanostructures: Optical Properties and Interaction with Hydrogen**
J.A. ALONSO, Dept. of Theoretical, Atomic and Optical Physics, University of Valladolid, Valladolid, Spain; A. ZAK, A. LAIKHTMAN, Physics Department, Faculty of Sciences, Holon Institute of Technlogy, Holon, Israel; J.I. MARTINEZ, ESISNA Group, Institute of Materials Science of Madrid (CSIC), Madrid, Spain

FI-5:IL02 **Computational Discovery of Novel 2D Materials**
K.S. THYGESEN, CAMD and Center for Nanostructured Graphene (CNG), Department of Physics, Technical University of Denmark, Lyngby, Denmark

FI-5:IL03 **A High Throughput and Unbiased Machine Learning Approach for Classification of Graphene Dispersions**
MD.J. ABEDIN, T. BARUA, M. SHAIBANI, **M. MAJUMDER**, Department of Mechanical & Aerospace Engineering, Monash University, Clayton, Australia

FI-5:IL04 **From the Atomic Structure to the Optoelectronic Properties Studies of 2D Materials via TEM**
R. ARENAL, Laboratorio Microscopias Avanzadas, U. Zaragoza, Zaragoza, Spain; Fundacion ARAID, Zaragoza, Spain; Instituto de Nanociencia y Materiales de Aragon (INMA), CSIC-U. Zaragoza, Zaragoza, Spain

Session FI-6

Application of graphene and other 2D layered materials and composites

FI-6:IL01 **Synergizing High Capacitance with Fast Charging: Pseudocapacitance in 2D Materials**
M.R. LUKATSKAYA, Department of the Mechanical and Process Engineering, ETH Zürich, Zürich, Switzerland

FI-6:L02 **Graphite Superlubricity Unabled by Triboinduced Nanocontacts**
R. BUZIO, A. GERBI, C. BERNINI, CNR-SPIN, Genova, Italy; L. REPETTO, Department of Physics, Università di Genova, Genova, Italy; A. VANOSSI, International School for Advanced Studies (SISSA) and CNR-IOM, Trieste, Italy

FI-6:L03 **Intercalation of Alkaline-ions in 3D-aeromaterial Consisting of MoS2**
P. HOLTZ, S. HANSEN, R. ADELUNG, Functional Nanomaterials, Department of Materials Science and Engineering, CAU Kiel, Kiel, Germany

FI-6:L04 **Nanotribology of AFM Probes Functionalized by Graphene**
A. GERBI, R. BUZIO, C. BERNINI, CNR-SPIN, Genova, Italy; L. REPETTO, Department of Physics, Università di Genova, Genova, Italy; A. VANOSSI, International School for Advanced Studies (SISSA) and CNR-IOM, Trieste, Italy

FI-6:IL05 **Surface Functionalization of Graphene Derivatives with Aromatic Ligands for Hybrid Nanocomposites with Inorganic Nanoparticles: Special Focus on Ag Nanoparticles Decorated Reduced Graphene Oxide for Thermally Conductive Textiles**
C. INGROSSO, G. MANDRIOTA, A. PANNIELLO, R. COMPARELLI, M. STRICCOLI, CNR-IPCF c/o Dept. of Chemistry, University of Bari, Bari, Italy; R. STRIANI, F. FERRARI, A. GRECO, C. ESPOSITO CORCIONE, Dept. of Innovation Engineering, University of Salento, Lecce, Italy; G.V. BIANCO, CNR-NANOTEC, c/o Dept. of Chemistry, University of Bari, Bari, Italy; A. MILELLA, M.L. CURRI, Dept. of Chemistry, University of Bari, Bari, Italy

FI-6:IL06 **Computational and Experimental Approaches for Printed 2D-based Devices**
G. FIORI, University of Pisa, Dipartimento Ingegneria Informazione, Pisa, Italy

FI-6:L07 **High-performance Flexible Broadband Photodetectors based on 2D Hafnium Selenosulfide Nanosheets**
R.K. ULAGANATHAN[1], R. SANKAR[1,2], F.-C. CHOU[1,3], [1]Center for Condensed Matter Sciences, National Taiwan University Taipei, Taiwan; [2]Institute of Physics, Academia Sinica, Taipei, Taiwan; [3]Taiwan Consortium of Emergent Crystalline Materials, Ministry of Science and Technology, Taipei, Taiwan

FI-6:L08 **Effect of Solvent on Corrosion Behavior of Graphene Oxide Coated AZ31B Magnesium Alloy**
M.F. MAQSOOD[1, 2], S.M. ZAIN MEHDI[3], U. LATIF[2], M.A. RAZA[2], Z.U. REHMAN[2], A. MAQSOOD[4], [1]Faculty of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, South Korea; [2]Institute of Metallurgy & Materials Engineering, Faculty of Chemical & Materials Engineering, University of the Punjab, Lahore, Pakistan; [3]Hybrid Materials Centre, Department of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, South Korea; [4]The School of Allied Health Sciences, The Children's Hospital & The Institute of Child Health, Lahore, Pakistan

SYMPOSIUM FJ

ADVANCED PHOTOCATALYTIC MATERIALS FOR ENERGY AND CHEMISTRY IN TRANSITION AND FOR THE ENVIRONMENT

Session FJ-1

Design elements and advanced concepts for photofunctional materials

FJ-1:IL01 **Phenomena Affecting the Carbon Dioxide Reduction Activity of Semiconductor Photoelectrodes**
M.T. MAYER, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany

FJ-1:IL02 **Dual Synergistic La1-xTixFeO3 Catalyst with Combined Photocatalytic and Photo-CWPO Catalytic Activity Under Visible Light for Water Treatment**
P. GARCÍA-MUÑOZ[1, 2], F. FRESNO[3], D. ROBERT[1], **N. KELLER**[1], [1]Institut de Chimie et Procédés pour l'Energie, l'Environnement et la Santé (ICPEES), CNRS/Strasbourg University, Strasbourg, France; [2]Escuela Técnica Superior de Ingenieros Industrial (ETSII), Universidad Politécnica de Madrid, Madrid, Spain; [3]Photoactivated Processes Unit, IMDEA Energy Institute, Móstoles, Madrid, Spain

FJ-1:IL03 **Nanostructure Design for Solar Water Splitting**
F. CADDEO, Z. DURMUS, B. MAHMOUDI, F. HIMMELSTEIN, D. EBERHART, T. LINDENBERG, H. ZHANG, R. NAUMANN, **A.W. MAIJENBURG**, Center for Innovation Competence SiLi-Nano, Martin-Luther-University Halle-Wittenberg, Halle (Saale), Germany

FJ-1:IL04 **How to Compare Photoelectrochemical Properties of TiO2 Polymorphs?**
A. DESWAZIERES, O. DURUPTHY, **C. LABERTY-ROBERT**, Laboratoire de Chimie de la Matière Condensée de Paris - UMR 7574, Sorbonne University, Paris, France

FJ-2:IL05 **Theoretical Design of Low-dimensional Metal-free Photocatalyst toward Overall Water Splitting under Visible Light**
XIAOJUN WU, University of Science and Technology of China, Hefei, Anhui, China

FJ-1:IL06 **Selective C1 Molecule Conversion for Solar-driven Artificial Carbon Cycle**
YUJIE XIONG, School of Chemistry and Materials Science, University of Science and Technology of China, Hefei, China

FJ-1:L07 **Synthesis, Characterisation and Photocatalytic Activity of Black Titanium Oxide Nanomaterials in Wastewater Treatment**
L. ANDRONIC, Transilvania University of Brasov, Department of Product Design, Mechatronics and Environment, Brasov, Romania

Session FJ-2

Understanding fundaments of photoinduced processes and charge transport

FJ-2:IL01 **Mechanistic Studies of Water Splitting Materials: Relation of Bulk and Surface Processes in Oxide Photoabsorbers**
J.P. HOFMANN, Surface Science Laboratory, Technical University of Darmstadt, Darmstadt, Germany

FJ-2:IL02 **Semiconductor Induced Nitrate Radicals Formation and Applications for Selective Photocatalytic Syntheses**
F. PARRINO, S. DIRÈ, R. CECCATO, Department of Industrial Engineering, University of Trento, Trento, Italy; L. PALMISANO, Department of Engineering, University of Palermo, Palermo, Italy; S. LIVRAGHI, E. GIAMELLO, Dipartimento di Chimica and NIS, University of Torino, Torino, Italy

FJ-2:IL03 **A Holistic Approach to Model the Kinetics of Photocatalytic Reactions**
J.Z. BLOH, DECHEMA-Forschungsinstitut, Frankfurt, Germany

FJ-1:IL04 **Charge Carriers Dynamics in WO3/BiVO4 Heterojunction Photoanodes**
I. GRIGIONI, M.V. DOZZI, **E. SELLI**, Dipartimento di Chimica, Università degli Studi di Milano, Milano, Italy

FJ-2:IL05 **Antibacterial Properties of Ca2Fe2O5 Brownmillerite for Water Disinfection**
A. ŠUTKA[1], M. VANAGS[1], L. MEZULE[2], [1]Institute of Materials and Surface Engineering, Faculty of Materials Science and Applied Chemistry, Riga Technical University, Riga, Latvia; [2]Water Research and Environmental Biotehnology Laboratory, Faculty of Civil Engineering, Riga Technical University, Riga, Latvia

FJ-2:IL06 **Quantifying Charge Transport and Recombination in Photoelectrodes**
P. CENDULA, A. SANCHETI, P. SIMON, G. CIBIRA, E. SERVICE, T. MOEHL, University of Zilina, Zilina, Slovakia

FJ-2:IL07 **Molybdenum Doped CuWO4-based Photoanodes for Solar Energy Conversion**
M.V. DOZZI, A. POLO, C. NOMELLINI, I. GRIGIONI, E. SELLI, Dipartimento di Chimica, Università degli Studi di Milano, Milano, Italy

FJ-2:IL08 **Light-driven Processes in Materials based on Colloidal Semiconductor Nanocrystals**
M. WÄCHTLER, Leibniz Institut of Photonic Technology, Jena, Germany

FJ-2:IL09 **Multiredox Catalysis on Metal Oxides for Solar Water Splitting**
C.A. MESA, Institute of Advanced Materials (INAM), Universitat Jaume I, Castellón, Spain

FJ-2:IL10 **Tailoring the Electron and Energy Transfer Mechanisms in Heterogeneous Photocatalysis by TiO2 Silanization: A Promising Opportunity for Emerging Technological Applications**
M. D'ARIENZO[1], F. PARRINO[2], R. SCOTTI[1], L. PALMISANO[3], S. DIRÈ[2], M. BELLARDITA[3], R. CECCATO[2], S. MOSTONI[1], B. DI CREDICO[1], [1]Department of Materials Science (INSTM), University of Milano-Bicocca, Milano, Italy; [2]Department of Industrial Engineering (DII), University of Trento, Trento, Italy; [3]Department of Engineering, University of Palermo, Palermo, Italy

FJ-2:IL11 **Post-excitation Transient IR Phenomena in α-Fe2O3 Films**
A. SULIGOJ, D. GRINBERG, **Y. PAZ**, Department of Chemical Engineering, Technion, Haifa, Israel

FJ-2:IL12 **EPR Analysis as a Tool for the Characterization of Photofunctional Materials**
S. LIVRAGHI, Dipartimento di Chimica and NIS, Università di Torino, Torino, Italy

FJ-1:IL13 **Surface Plasmon-driven Inactivation of Microorganisms and Decomposition of Organic Compounds**
M. ENDO-KIMURA[1], B. OHTANI[1], A. MARKOWSKA-SZCZUPAK[2], **E. KOWALSKA**[1], [1]ICAT, Hokkaido University, Sapporo, Japan; [2]West Pomeranian University of Technology, Szczecin, Poland

Session FJ-3

Design approaches for advanced applications

FJ-3:IL01 **Theoretical Design of Perovskite Based Photovoltaic Materials**
ZHENYU LI, Hefei National Laboratory for Physical Sciences at Microscale, University of Science and Technology of China, Hefei, China

FJ-3:L02 **Graphene as a 2D Support Shuttle for Separating Photo-generated Charges: an Example combining Copper and TiO2 Nanotubes**
E. ZGHAB, M. HAMANDI, F. DAPPOZZE, C. GUILLARD, **G. BERHAULT**, IRCELYON, Villeurbanne, France; E. ZGHAB, M. SAÏD ZINA, Univ. Tunis El Manar, Laboratoire de Chimie des Matériaux et Catalyse, Tunis, Tunisia; H. KOCHKAR, Basic & Applied Scientific Research Center, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

FJ-3:IL03 **Artificial Photosynthesis of C1-C6 using Copper and Iron Mixed Oxide Films**
HYUNWOONG PARK, School of Energy Engineering, Kyungpook National University, Daegu, South Korea

FJ-3:L04 **Comparison of the Properties and Photocatalytic Activity of Two Different C,N-TiO2 Semiconductors Obtained using Renewable Raw Materials as Doping Source**
M.C. ARIZA-TARAZONA, E.I. CEDILLO-GONZÁLEZ, C. SILIGARDI, Dipartimento di Ingegneria "Enzo Ferrari", Università degli studi di Modena e Reggio Emilia, Modena, Italy

FJ-3:L05 **Al & Ga doped ZnO Nanowires for Water Remediation by Photocatalysis**
A. BAILLARD[1], E. APPERT[1], T. DEDOVA[3], P. GAFFURI[1,2], M. DANILSON[4], M. WEBBER[1], O. CHAIX-PLUCHERY[1], I. OJA-ACIK[3], V. CONSONNI[1], [1]Université Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France; [2]Université Grenoble Alpes, CNRS, Grenoble INP, Institut NEEL, Grenoble, France; [3]Laboratory of Thin Film Chemical Technologies, Department of Materials and Environmental Technology, Tallinn Univ. of Technology, Tallinn, Estonia; [4]Laboratory of Optoelectronic Materials Physics, Department of Materials and Environmental Technology, Tallinn Univ. of Technology, Tallinn, Estonia

FJ-3:L06 **Harnessing Broad Spectrum Solar Energy for Selective CO2 Photoreduction with Water**
L. HAMMOUD, C. STREBLER, J. QUINET, S. BARDEY, V. KELLER, **V. CAPS**, Institut de Chimie et des Procédés pour l'Energie, l'Environnement et la Santé (ICPEES), Université de Strasbourg, UMR CNRS 7515, Strasbourg, France

FJ-3:L07 **Unbiased Photoelectrochemical Water Splitting Cell Exceeding >10% Solar-to-hydrogen Conversion Efficiency with Surface Band-modified Cu(In,Ga)(S,Se)2 Photocathode and Halide Perovskite Solar Cell**
BYUNGHA SHIN, Dept. of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, Daejeon, South Korea

SYMPOSIUM FK

THERMOELECTRICS: MATERIALS RESEARCH AND APPLICATION TECHNOLOGIES

Session FK-1

Thermoelectric materials research & characterization

FK-1:IL01 **Synergy between Theory, Calculations, and Experiments: How to Improve it**
M. FORNARI, Department of Physics and Science of Advanced Materials Program, Central Michigan University, Mt. Pleasant, MI, USA

FK-1:IL02 **Assessing the Effect of Synthetic Conditions on PEDOT Thermoelectric Properties: A Combination of First Principles and Classical Molecular Dynamics Simulations**
A. CAPPAI, **C. MELIS**, Department of Physics, University of Cagliari, Cittadella Universitaria, Monserrato (CA), Italy; D. NARDUCCI, Department of Materials Science, University of Milano-Bicocca, Milano, Italy

FK-1:IL03 **Ab Initio Calculations of Thermal Transport Properties in Semiconductors and Metals**
L. CHAPUT, Institut Universitaire de France, Paris Cedex, Université de Lorraine, LEMTA, UMR 7563, Vandœuvre-lès-Nancy, France

FK-1:IL04 **Correlated Disorder in Thermoelectric Materials**
B. BRUMMERSTEDT IVERSEN, Center for Integrated Materials Research, Department of Chemistry, Aarhus University, Denmark

FK-1:IL05 **Recent Advances in Understanding of Resonant States in Thermoelectric Materials**
B. WIENDLOCHA, Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Krakow, Poland

FK-1:IL06 **Band Structure and Scattering Phase Diagram of Half-Heusler Thermoelectric Materials**
CHENGUANG FU, TIEJUN ZHU, Zhejiang University, Hangzhou, China

FK-1:IL08 **From Designing Thermoelectric Highly Efficient Hf-free n- & p-type Heusler Compounds via Phase Separation and Nano-composites to the Automated Fabrication of HH-modules**
B. BALKE, Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKS, Hanau, Germany; D. ZUCKERMANN, Isabellenhütte Heusler GmbH & Co. KG, Dillenburg, Germany

FK-1:L09 **Innovative Oxidation Protective Glass Coating for Magnesium Silicide-based Thermoelectrics**
F. D'ISANTO[1], F. SMEACETTO[1], K. CHEN[2], M.J. REECE[2], M. SALVO[1]. [1]Department of Applied Science and Technology (DISAT), Politecnico di Torino, Torino, Italy; [2]Nanoforce Technology Limited and School of Engineering & Materials Science, Queen Mary University of London, London, UK

FK-1:IL10 **Layered Chalcogenides as Thermoelectric Materials**
P. VAQUEIRO, Department of Chemistry, University of Reading, Reading, UK

FK-1:IL11 **Unexpected Interstitials in Half-Heusler Compounds**
WENJIE XIE[1], R. YAN[1], A. WEIDENKAFF[1,2], [1]Department of Materials and Earth Sciences, Technical University of Darmstadt, Darmstadt, Germany; [2]Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKSK, Germany

FK-1:IL12 **Crystal Structure and Thermoelectric Application of Zintl Mg3Sb2-based Materials**
TSUTOMU KANNO, Panasonic Corporation, Seika, Kyoto, Japan

FK-1:IL13 **Thermomagnetic Transport in Layered Topological Semimetals**
M. ZEBARJADI, Md.S. AKHANDA, E. REZAEI, K. ESFARJANI, University of Virginia, Charlottesville, VA, USA; S. KRYLYUKE, A.V. DAVYDOV, N, Material Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD, USA

FK-1:IL14 **High-performance Thermoelectric Oxides**
A.V. KOVALEVSKY, G. CONSTANTINESCU, D. LOPES, K.V. ZAKHARCHUK, S. RASEKH, A.A. YAREMCHENKO, CICECO - Aveiro Institute of Materials, Department of Materials and Ceramic Engineering, University of Aveiro, Aveiro, Portugal; N.M. FERREIRA, i3N, Physics Department, University of Aveiro, Aveiro, Portugal; W. XIE, A. WEIDENKAFF, Materials and Resources, Techn. Universität Darmstadt, Darmstadt, Germany; A. GALATANU, National Institute of Materials Physics, Magurele, Romania; M.H. AGUIRRE, Condensed Matter Physics Department, University of Zaragoza, Institute of Material Science of Aragón, ICMA-CSIC, Zaragoza, Spain; Advanced Microscopy Laboratory I+D Building-Campus Río Ebro, Zaragoza, Spain

FK-1:IL15 **Ductile Inorganic Semiconductors and their Applications in Thermoelectrics**
LIDONG CHEN, XUN SHI, Shanghai Institute of Ceramics, CAS, Changning, Shanghai, China

FK-1:IL16 **Low-temperature Thermoelectric Material Ta4SiTe4 and Nb4SiTe4**
YOSHIHIKO OKAMOTO, Nagoya University, Nagoya, Japan

FK-1:IL17 **Ultrahigh Thermoelectric Figure of Merit in Hole-doped Polycrystalline SnSe**
IN CHUNG, School of Chemical and Biological Engineering, Seoul National University, Seoul, South Korea

FK-1:L18 **A New Oxidation Resistant Glass-ceramic Coating for Titanium Suboxide (TiOx)**
F. SMEACETTO[1], F. D'ISANTO[1], H-P. MARTIN[2], R. SEDLÁK[3], M. LISNICHUK[3,4], A. CHRYSANTHOU[5], M. SALVO[1], [1]Department of Applied Science and Technology (DISAT), Politecnico di Torino, Torino, Italy.; [2]Fraunhofer Institute of Ceramic Technologies and Systems, Dresden, Germany; [3]Institute of Materials Research, Slovak Academy of Sciences, Kosice, Slovakia; [4]Institute of Physics, Faculty of Science, P.J. Safárik University, Kosice, Slovakia; [5]School of Physics, Engineering and Computer Science, University of Hertfordshire, Hatfield, Herts, UK

FK-1:L19 **Boosting the Anisotropic Thermoelectric Performance of PEDOT:PSS by Brush Printing**
BOKAI ZHANG, F. MOLINA-LOPEZ, KU Leuven, Leuven, Belgium

FK-1:IL20 **Complex Sulfide Thermoelectric Materials**
C. BOURGES, WPI International Center for Materials Nanoarchitechtonics (WPI-MANA), National Institute for Materials Science (NIMS), Tsukuba, Japan

FK-1:IL21 **Optimization of Thermoelectric Properties in Some Transition Metal Sulfides: the Role of Magnetism**
S. HEBERT, Laboratoire CRISMAT Normandie Université, UMR6508 CNRS, ENSICAEN, UNICAEN, Caen, France

FK-1:IL22 **Perovskites with Low Thermal Conductivity**
A. GRAFF, A. BARANOVSKIY, A. AZULAY, **Y. AMOUYAL**, Department of Materials Science & Engineering, Technion - Israel Institute of Technology, Haifa, Israel

FK-1:IL23 **Soft Thermoelectrics and Additive Manufacturing for New Thermoelectric Applications**
J.J. URBAN, LBNL, Berkeley, CA, USA

FK-1:IL24 **Current Progress and Challenges in Organic Thermoelectrics**
M. CAMPOY-QUILES, Institute of Materials Science of Barcelona (ICMAB-CSIC), Bellaterra, Spain

FK-1:IL25 **Molybdenum-based Cluster Compounds as Candidates for High-temperature Thermoelectric Applications**
C. CANDOLFI[1], P. GOUGEON[2], P. GALL[2], R. GAUTIER[2], A. DAUSCHER[1], B. LENOIR[1], [1]Institut Jean Lamour, UMR 7198 CNRS - Université de Lorraine, Nancy Cedex, France; [2]Univ Rennes, CNRS, ISCR UMR 6226, INSA Rennes, ENSC Rennes, Rennes, France

FK-1:IL26 **Si-based Nanowires for Integrated Micro Thermo-electric Generators**
A. MORATA[1], J.M. SOJO GORDILLO[1], C. DUQUE SIERRA[1], A. TARANCÓN[1,2], [1]Catalonia Institute for Energy Research (IREC), Sant Adrià de Besòs, Barcelona, Spain; [2]Institució Catalana de Recerca I Estudis Avançats (ICREA), Barcelona, Spain

FK-1:IL27 **Recent Developments in Thermoelectric Pnictides**
K. KOVNIR, Department of Chemistry, Iowa State University, Ames Laboratory, U.S. Department of Energy, AMES, IA, USA

FK-1:IL28 **Liquid Thermocells with High Thermopowers for Low-grade Heat Harvesting**
DONGYAN XU, Department of Mechanical and Automation Engineering, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong Special Administrative Region, China

Session FK-2
Solid-state device research and modeling

FK-2:IL01 **Thermoelectric Material with Electrolyte Gate**
HIROMICHI OHTA, Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan

FK-2:IL02 **Thermoelectric Silicide Devices: Mechanical Reliability Large-scale Synthesis, and Module Integration**
YU-CHIH TSENG, Canmet Materials, Natural Resources Canada, Hamilton, Canada

FK-2:IL03 **Modelling of TEG System Integrated to Heat Sources and Thermal Impedance Management of TE Device Structures**
TSUTOMU IIDA, H. KUNIOKA, K. YOKOTA, T. MOTEGI, H. TSUCHIDA, Y. IZUMI, K. YOSHIMURA, R. INOUE, Y. ARAI, Y. KOGO, J. KUSAKA, Y. DAISHO, Tokyo University of Science, Tokyo, Japan; Waseda University, Tokyo, Japan; NISSAN Motor Co.,Ltd., Yokohama, Japan; Honda R&D Co.,Ltd., SUZUKI Co.,Ltd. Yokohama, Japan

FK-2:IL04 **Innovative Design of Thermoelectric Micro-generators based on Bismuth-telluride**
S. EL OUALID[1], F. KOSIOR[1], A. DAUSCHER[1], C. CANDOLFI[1], G. SPAN[2], E. MEHMEDOVIC[2], J. PARIS[2], **B. LENOIR**[1], [1]Institut Jean Lamour, UMR 7198 CNRS, Université de Lorraine, Nancy Cedex, France; [2]Mahle Thermoelektronik GmbH, Duisburg, Germany

FK-2:IL05 **The Black Metal for Enhanced Thermoelectric Power Generation**
CHUNLEI GUO, University of Rochester, Rochester, NY, USA

FK-2:IL06 **Phonon Engineering in Thermoelectric Materials and Flexible Thermoelectric Devices for Body Heat Harvesting and Personal Thermoregulation**
WOOCHUL KIM, School of Mechanical Engineering, Yonsei University, Seoul, South Korea

Session FK-3
Converter technologies and applications

FK-3:IL01 **Additive Manufacturing Approaches for Thermoelectrics**
S. LEBLANC, R. WELCH, B. SISIK, Department of Mechanical and Aerospace Engineering, The George Washington University, Washington, DC, USA

FK-3:L02 **Additive and Minimalistic Process of Flexible Inorganic Thermoelectric Devices Enabled by Laser-printing on Plastic Foil**
YUAN TIAN, F. MOLINA-LOPEZ, KU Leuven, Leuven, Belgium

FK-3:L03 **Two-in-one Management and Recovering of Thermal Energy from LTCC Flip-chip Packages**
N. JAZIRI, M.-K. IQBAL, A. SCHULZ, H. BARTSCH, J. MÜLLER, Electronics Technology Group, Institute of Micro and Nanotechnologies MacroNano, Technische Universität Ilmenau, Ilmenau, Germany; F. TOUNSI, Systems Integration & Emerging Energies (SI2E), École Nationale d'Ingénieurs de Sfax (ENIS), Université de Sfax, Sfax, Tunisia

FK-3:IL04 **An Update on the Development of Skutterudite-based Thermoelectric Technology for Integration into an MMRTG**
T. CAILLAT[1], S. PINKOWSKI[1], I. CHI[1], C.-K. HUANG[1], K. SMITH[1], K. YU[1], J. PAIK[1], P. GOGNA[1], B. PHAN[1], E. HEIAN[1], T. HOLGATE[2], Y. SONG[2], J. VANDERVEER[2], R. BENNETT[2], S. KEYSER[2], P. FRYE[3], K. WEFERS[3], [1]Jet Propulsion Laboratory/California Institute of Technology MS 277-207, Pasadena CA, USA; [2]Teledyne Energy Systems, Inc., Hunt Valley, MD, USA; [3]Aerojet Rocketdyne, Canoga Park, CA, USA

FK-3:IL05 **Hybrid Thermionic-thermoelectric Generators for Concentrated Solar Radiation: Technological Advances and Future Challenges**
A. BELLUCCI, Istituto di Struttura della Materia-CNR (ISM-CNR), DiaTHEMA Lab, Monterotondo (RM), Italy

FK-3:IL06 **Oxide Thermoelectric from Materials Synthesis to Modules**
N. PRYDS, Technical University of Denmark, Department of Energy Conversion and Storage, Kgs. Lyngby, Denmark

SYMPOSIUM FL

STIMULI RESPONSIVE AND MULTIFUNCTIONAL POLYMERS: PROGRESS IN MATERIALS AND APPLICATIONS

Session FL-1

Shape-memory polymers and actuators

FL-1:IL01 **Self-healing Copolymers via van der Waals Interactions**
M.W. URBAN, Clemson University, Department of Materials Science and Engineering, Clemson, SC, USA

FL-1:IL02 **Multifunctional Interpenetrated Polymer Networks**
K. ROHTLAID[1], F. BRAZ RIBEIRO[1], T.M.G. NGUYEN[1], C. SOYER[2], J.D.W. MADDEN[3], E. CATTAN[2], F. VIDAL[1], **C. PLESSE**[1], [1]CY Cergy Paris Université, LPPI, Cergy, France; [2]Univ. Polytechnique des Hauts de France, CNRS, Univ. Lille, Yncrea, Centrale Lille, UMR 8520 - IEMN, DOAE, Valenciennes, France; [3]Department of Electrical & Computer Engineering, Advanced Materials & Process Engineering Laboratory, University of British Columbia, Vancouver, Canada

FL-1:IL03 **Shape-memory Polymer Actuators for Robotics**
A. LENDLEIN, Institute of Biomaterial Science, Helmholtz-Zentrum Geesthacht, Teltow, Germany, & University of Potsdam, Potsdam, Germany

FL-1:L04 **Stress-free two-way Shape Memory Effect of Poly(caprolactone)-based Semicrystalline Networks**
S. PANDINI, N. INVERARDI, Department of Mechanical and Industrial Engineering, University of Brescia, Brescia, Italy; M. TOSELLI, Department of Industrial Chemistry "Toso Montanari", University of Bologna, Bologna, Italy; M. MESSORI, Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy; G. SCALET, F. AURICCHIO, Department of Civil Engineering and Architecture, University of Pavia, Pavia, Italy

FL-1:L05 **Effect of Build Orientation, Print Parameters, and Thermo-mechanical History on Performance of 3D-printed Biomedical Shape-memory Thermoplastic Polyurethane**
D.L. SAFRANSKI, MedShape Inc., Atlanta, GA, USA; J.S. CONSOLI, Georgia Institute of Technology, Atlanta, GA, USA

Session FL-2

Degradable, stimuli-sensitive polymers

FL-2:IL01 **Stimuli-responsive Polymer-based Sensors, Muscles, and Drug Delivery Platforms**
M.J. SERPE, Department of Chemistry, University of Alberta, Edmonton, Canada

FL-2:IL02 **pH-sensitive Polymers and Polymer Nanocomposites for Drug Delivery**
BIQIONG CHEN, Queen's University Belfast, Belfast, UK

Session FL-3

Stimuli-sensitive gels

FL-3:IL01 **How Can "Smart" Organometallic Hydrogels Learn and Forget**
M.A. HEMPENIUS, K. ZHANG, X. FENG, S. SUI, **G.J. VANCSO**, University of Twente, Enschede, The Netherlands

FL-3:L02 **Characterisation and Development of Polycationic Electro-Active Hydrogels**
M. KAIKOV, **A. SORT-MONTENEGRO**, E. DEASY, L. DOWLING, C. DELANEY, L. FLOREA, School of Chemistry & AMBER, the SFI Research Centre for Advanced Materials and BioEngineering Research, Trinity College Dublin, Dublin, Ireland

FL-3:L03 **Stimuli Responsive Hydrogel Actuators for Microscale Cargo Transport**
T. SPRATTE, C. ARNDT, C. SELHUBER-UNKEL, Institute for Molecular Systems Engineering, Heidelberg University, Germany; R. COLACO, A. STAUBITZ, Institute for Organic and Analytical Chemistry, Bremen University, Germany; N. GEID, J. RÜHE, IMTEK-Department of Microsystems Engineering, Freiburg University, Germany

FL-3:IL04 **Dually Cross-linked Stimuli-sensitive Gels**
D. KUCKLING[1], M. RODIN[1], J. LI[1,2], J. PARADIES[1], M. YIN[2], [1]Department of Chemistry, Paderborn University, Paderborn, Germany; [2]State Key Laboratory of Chemical Resource Engineering, Beijing Laboratory of Biomedical Materials, Beijing University of Chemical Technology, Beijing, China

FL-3:IL05 **Stimuli-sensitive Underwater Adhesive Gels inspired by Sandcastle Worms**
M. KAMPERMAN, Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands

Session FL-4

Multifunctional (nano)composites and surfaces; multi-material systems

FL-4:IL01 **Light-driven Shape Change, Assembly, and Non-equilibrium Motion of Responsive Polymer Composites**
R.C. HAYWARD, University of Colorado Boulder, Boulder, CO, USA

FL-4:IL02 **Lignin as a Valuable Tool for Functional Coatings, Composites and Beyond**
G. GRIFFINI, Department of Chemistry, Materials and Chemical Engineering "Giulio Natta", Politecnico di Milano, Milano, Italy

FL-4:IL03 **Flexible Sensors Driven by Piezoionic Effect**
HIDENORI OKUZAKI, University of Yamanashi, Kofu, Japan

FL-4:IL04 **Molecular and Bulk Mechanics of Multifunctional Catecholamine Polymer Coatings**
P. DELPARASTAN[1], K. MALOLLARI[2], K. LEE[3], M. PARK[2], C. GRIGOROPOULOS[2], **P.B. MESSERSMITH**[1,3,4], [1]Materials Science and Engineering Department, [2]Mechanical Engineering Department, [3]Bioengineering Department, University of California, Berkeley, CA, USA; [4]Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

FL-4:IL05 **Carbon Nanotubes vs Graphene as Fillers for Functional Polymers**
P. POULIN, Centre de Recherche Paul Pascal CNRS, University of Bordeaux, Pessac, France

FL-4:L06 **Optical Sensor Based on Redox-active Tetrazolium / Pluronic Nanoparticles Embedded in PDMS Films**
E. ARAYA-HERMOSILLA, F. VISENTIN, V. MATTOLI, Center for Materials Interfaces, Istituto Italiano di Tecnologia, Pontedera, Italy; R. ARAYA-HERMOSILLA, Programa Institucional de Fomento a la Investigación, Desarrollo e Innovación, Universidad Tecnológica Metropolitana, Santiago, Chile; F. PICCHIONI, Department of Chemical Engineering - Product Technology, University of Groningen, Groningen, The Netherlands; A. PUCCI, Department of Chemistry, University of Pisa, Pisa, Italy

Session FL-5

Pharmaceutical and medical applications of smart polymers

FL-5:IL01 **Biomaterials for Regenerative Engineering: Enabling Regenerative Medicine**
G. AMEER, Northwestern University, Evanston, IL, USA

FL-5:IL02 **Oxidation-sensitive Polymers as Anti-inflammatory Agents**
N. TIRELLI, Laboratory of Polymers and Biomaterials, Fondazione Istituto Italiano di Tecnologia (IIT), Genova, Italy

FL-5:IL03 **Shape Memory Polymer Hydrogel Foams for Crohn's Fistula Healing**
M.B.B. MONROE[1], H.T. BEAMAN[1], B. HOWES[2], P. GANESH[1], [1]Biomedical and Chemical Engineering, BioInspired Syracuse, Syracuse University, Syracuse, NY, USA; [2]Chemistry, Lemoyne University, USA

FL-5:IL04 **A New Class of Submolecular Switches based on the DBCOD Conformational Change**
W. FU[1], T. ALAM[2], R. ADAMS[3], J.C. LI[4], W. YANG[4], **JENNIFER LU**[1], [1]Materials Science and Engineering, University of California at Merced, Merced, CA, USA; [2]Sandia National Laboratory, USA; [3]Chemistry Department, University of Manchester, UK; [4]Chemistry Department, Duke University, USA

FL-5:IL05 **Biodegradable Injectable Polymer Systems Exhibiting Temperature-responsive Irreversible Gelation**
YUICHI OHYA, Faculty of Chemistry, Materials and Bioengineering, Kansai University, Suita, Japan

Session FL-6

Additive manufacturing for multifunctional materials

FL-6:IL01 **Shaping Matter by using Light: 3D Laser-assisted Additive Manufacturing for Fundamental Neuromechanobiology and In-vitro Disease Models**
A. ACCARDO, Department of Precision and Microsystems Engineering, Delft University of Technology, Delft, The Netherlands

FL-6:IL02 **Building Multifunctional, Morphing 3D Structures**
T.H. WARE, Department of Biomedical Engineering, Department of Materials Science and Engineering, Texas A&M University, College Station, TX, USA

FL-6:IL03 **Photo-crosslinkable, 3D-printable (Bio)Polymer Platform to Serve Tissue Engineering Needs**
J. VAN HOORICK[1,2], L. TYTGAT[1,2], L. VAN DAMME[1,3], A. ARSLAN[1], P. GRUBER[4,5], M. MARKOVIC[4,5], A. OVSIANIKOV[4,5], H. DECLERCQ[6], P. DUBRUEL[1], **S. VAN VLIERBERGHE**[1,2], [1]Polymer Chemistry & Biomaterials Group, Centre of Macromolecular Chemistry, Ghent University, Ghent, Belgium; [2]Brussels Photonics, Department of Applied Physics and Photonics, Vrije Universiteit Brussel, Brussels, Belgium; [3]Plastic and Reconstructive Surgery, Department of Surgery, University Hospital Ghent, Ghent, Belgium; [4]Institute of Materials Science and Technology, Vienna University of Technology (TU Wien), Austria; [5]Austrian Cluster for Tissue Regeneration (www.tissue-regeneration.at); [6]Tissue engineering and Biomaterials Group, Department of Basic Medical Sciences, University Hospital Ghent, Ghent, Belgium

FL-6:IL04 **Advancing 4D Fabrication and Computational Analysis of Shape-Memory Polymers**
J.H. HENDERSON, BioInspired Syracuse: Institute for Material and Living Systems, Syracuse Biomaterials Innovation Facility, Syracuse University, Syracuse, NY, USA

Session FL-7

Multifunctional materials for soft robotics

FL-7:IL01 **Bioinspired Smart Materials: Sensing, Solar Harvesting, and Soft Robotics**
XIMIN HE, University of California at Los Angeles, Los Angeles, CA, USA

FL-7:L02 **Triplet Enhanced Photomechanics of Stilbene Photopolymers for Soft Robotic Actuator Applications**
D. BEERY, G. MCLEOD, K. HANSON, Florida State University, Department of Chemical Engineering; E. STANISAUSKIS, Florida State University, Materials Science and Engineering; D. RAMESH, **W. OATES**, Florida A&M-Florida State Universities, Department of Mechanical Engineering, Tallahassee, FL, USA

FL-7:L03 **Direct Laser Writing of Responsive Polymer Microstructures - Towards Soft Robotics at the Micro-scale**
L. FLOREA, T. FARAONE, S. KOLAGATLA, A. ENNIS, L. LAVELLE, Colm Delaney School of Chemistry & AMBER, the SFI Research Centre for Advanced Materials and BioEngineering Research, Trinity College Dublin, Ireland

FL-7:IL04 **HASEL Artificial Muscles**
C. KEPLINGER, Max Planck Institute for Intelligent Systems, Stuttgart, Germany

FL-7:IL05 **Multi-functional Flexible Sensors for Soft Fobotics**
KUNIHARU TAKEI, Osaka Prefecture University, Sakai, Osaka, Japan

FL-7:IL06 **Plants as Concept Generators for the Development of New Materials Systems for Soft-robotics**
T. SPECK[1, 2, 3], M. THIELEN[1, 2], F. ESSER[1, 2, 3], B. MAZZOLAI[4], [1]Botany: Functional Morphology & Biomimetics, Botanic Garden of the University of Freiburg, Freiburg, Germany; [2]Freiburg Materials Research Centre (FMF) and Freiburg Institute for Interactive Materials & Bioinspired Technologies (FIT), Germany; [3]Cluster of Excellence Living, Adaptive and Energy-autonomous Materials Systems (livMatS @ FIT); [4]Italian Institute of Technology (IIT), Italy

SYMPOSIUM FM

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

Session FM-1

Materials and materials design, basic phenomena and theory, functional properties

FM-1:IL01 **Multicaloric Heusler Compounds: Review and Prospects**
O. GUTFLEISCH, K. SKOKOV, A. TAUBEL, L. PFEUFFER, F. SCHEIBEL, TU Darmstadt, Materials Science, Functional Materials, Darmstadt, Germany; T. GOTTSCHALL, Helmholtzzentrum Dresden Rossendorf, HZDR, Germany

FM-1:IL02 **High Temperature Shape Memory Alloys - Current Status and Future**
I. KARAMAN, T.V. UMALE, A.R. DEMBLON, W. TREHERN, B. YOUNG, Department of Materials Science and Engineering, Texas A&M University, College Station, TX, USA

FM-1:IL03 **A First-principles Perspective on the Interplay of Magnetism and Microstructure in Ni-Mn-based Heusler Alloys**
M.E. GRUNER, Faculty of Physics and Center for Nanointegration, CENIDE, University of Duisburg-Essen, Duisburg, Germany

FM-1:L04 **Effect of Doping on Magnetocrystaline Anisotropy of Ni-Mn-Ga Magnetic Shape Memory Alloy: An Ab Initio Study**
M. ZELENY, Brno University of Technology, Faculty of Mechanical Engineering, Brno, Czech Republic; Charles University, Faculty of Mathematics and Physics, Prague, Czech Republic; L. STRAKA, M. RAMEŠ, O. HECZKO, Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic

FM-1:IL05 **Elasticity and Microstructures in Shape Memory Alloys: from Highly Mobile Interfaces to Kwinks**
H. SEINER, Institute of Thermomechanics, Czech Academy of Sciences, Prague, Czech Republic

FM-1:L06 **Age Hardening Behavior of (Ni+Cu)-rich Ti-Ni-Cu Alloys**
TAE-HYUN NAM, JI-HYUN KIM, Gyeongsang National University, Jinju, South Korea

FM-1:IL07 **Strain Glass and Novel Properties**
XIAOBING REN, Frontier Institute of Science and Technology, Xi'an Jiaotong University, Center for Functional Materials, National Institute for Materials Science, Tsukuba, Japan

FM-1:IL08 **Transition Metals Doping of Ni-Mn-Ga and Comparison of Single Crystals Grown by Different Methods**
O. HECZKO, V. KOPECKÝ, D. MUSIIENKO, F. NILSEN, M. RAMEŠ, P. VERTÁT, Š. SUKUP, S. HECZKO, L. STRAKA, FZU - Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic; R. COLMAN, Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic

FM-1:IL09 **Optimizing Novel Manufacturing Processes for Ni-Mn-Ga Magnetic Shape Memory Materials**
E. PAGOUNIS, ETO MAGNETIC GmbH, Stockach, Germany

FM-1:IL10 **NiMn Based Heusler Alloys for Magnetocaloric Applications: Direct and Inverse Magnetocaloric Effects, Large Scale Synthesis**
S. FABBRICI, C. BENNATI, F. ALBERTINI, IMEM-CNR, Parma, Italy; F. PUGLIELLI, V. MUSSI, MUSP Laboratory, Piacenza, Italy; F. CUGINI, N. SARZI AMADÈ, M. SOLZI, Department of Mathematical, Physical and Computer Sciences, University of Parma, Parma, Italy

FM-1:IL11 **Reentrant Martensitic Transformation in Co-based Heusler Alloys**
XIAO XU[1], T. KANOMATA[2], R. KAINUMA[1], [1]Department of Materials Science, Graduate School of Engineering, Tohoku University, Sendai, Japan; [2]Research Institute for Engineering and Technology, Tohoku Gakuin University, Tagajo, Japan

FM-1:IL12 **Coupled Transformation and Plasticity in NiTi Shape Memory Alloy**
P. SEDLÁK, B. BENEŠOVÁ, M. FROST, H. SEINER, Institute of Thermo-mechanics, Czech Academy of Sciences, Prague, Czech Republic; L. HELLER, P. ŠITTNER, Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic

FM-1:L13 **Relationship of the Lattice Parameter with the Degree of Ordering in Fe-Ga Alloys: Experimental and Ab Initio Studies**
V.D. BUCHELNIKOV, M.V. MATYUNINA, M.A. ZAGREBIN, V.V. SOKOLOVSKIY, Chelyabinsk State University, Chelyabinsk, Russia; A.M. BALAGUROV, Joint Institute for Nuclear Research, Dubna, Russia; I.S. GOLOVIN, National University of Science and Technology "MISIS", Moscow, Russia

FM-1:IL14 **Symmetry Analysis of Martensitic Transition in Magneto-caloric Heusler Alloys**
F. ORLANDI[1], A. CAKIR[2], R. WAITE[1, 3], P. MANUEL[1], D,D. KHALYAVIN[1], M, ACET[4], L. RIGHI[5, 6], [1]ISIS Facility, Rutherford Appleton Laboratory - STFC, Chilton, Didcot, UK; [2]Mugla Stiki Kocman University, Department of Metallurgical and Materials Engineering, Mugla, Turkey; [3]H.H. Wills Physics Laboratory, University of Bristol, Bristol, UK; [4]Faculty of Physics and Center for Nanointegration (CENIDE), Universitat Duisburg-Essen, Duisburg, Germany; [5]Department of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, Italy; [6]IMEM-CNR, Parma, Italy

FM-1:IL15 **TEM Studies on Magnetic and Crystallographic Micro-structures Associated with Martensitic Phase Transformations**
YASUKAZU MURAKAMI, Department of Applied Quantum Physics and Nuclear Engineering, Kyushu University, Fukuoka, Japan

FM-1:L16 **Ultrasonic-based Evaluation of NiTi Elasticity during Stress-induced Martensitic Transformation**
T. GRABEC, K. ZOUBKOVA, P. STOKLASOVA, P. SEDLAK, H. SEINER, Institute of Thermomechanics of the CAS, Prague, Czech Republic

FM-1:L17 **Theory and Application of NiTi Thin Film Coatings for Non-destructive Defect Analysis**
PING WU, BOON TEOH TAN, Singapore University of Technology and Design, Singapore

FM-1:L18 **Shape Recovery Behaviour of NiTi-PMMA Composite**
S. SAMAL, O. KOSJAKOVA, D. VOKOUN, P. ŠITTNER, FZU-Institute of Physics of Czech Academy of Science, Prague, Czech Republic

FM-1:L19 **The Way for the Controlling the Martensite Stabilization Effect in NiTi-based Alloys**
N. RESNINA, I. PONIKAROVA, P. EGOROV, A. GABRIELIAN, S. BELYAEV, Saint-Petersburg State University, Saint-Petersburg, Russia

FM-1:L20 **Evolution of Structure and Properties of Nickel-enriched Ti-Ni Shape Memory Alloy Subjected to Bi-axial Deformation**
V. KOMAROV, R. KARELIN, V. YUSUPOV, Baikov Institute of Metallurgy and Materials Science, Moscow, Russia; G. KORPALA, R. KAWALLA, U. PRAHL, TU Bergakademie Freiberg, Germany; I. KHMELEVSKAYA, S. PROKOSHKIN, National University of Science and Technology MISIS, Moscow, Russia

FM-1:IL21 **Multicaloric effects in Shape Memory Alloys**
L. MANOSA, Universitat de Barcelona, Barcelona, Catalonia, Spain

FM-1:IL22 **The Use of Magnetic Shape Memory Alloys in Multicaloric Refrigeration Cycles**
T. GOTTSCHALL, E. BYKOV, Y. SKOURSKI, J. WOSNITZA, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; A. GRÀCIA-CONDAL, LL. MAÑOSA, A. PLANES, Universitat de Barcelona, Barcelona, Catalonia, Spain; B. BECKMANN, A. TAUBEL, L. PFEUFFER, O. GUTFLEISCH, Technical University of Darmstadt, Darmstadt, Germany

FM-1:L23 **Magnetocaloric and Elastocaloric Properties of Polycrystalline Samples of NiMnGaCu Ferromagnetic Shape Memory Alloy: Effect of Improvement of Thermoelastic Martensitic Transformation**
E. VILLA[1], C. TOMASI[2], F. VILLA[1], A. NESPOLI[1], F. PASSARETTI[1], E. BESTETTI[1], R. FRIGERIO[1], F. ALBERTINI[3], G. LAMURA[4], F. CANEPA[5], [1]Consiglio Nazionale delle Ricerche – Istituto della Materia Condensata e di Tecnologie per l'Energia (CNR-ICMATE Sede di Lecco), Lecco, Italy; [2]Consiglio Nazionale delle Ricerche – Istituto della Materia Condensata e di Tecnologie per l'Energia (CNR-ICMATE Sede di Genova), Genova, Italy; [3]Consiglio Nazionale delle Ricerche – Istituto dei Materiali per l'Elettronica e il Magnetismo, Parma, Italy; [4]CNR-SPIN, Genova, Italy; [5]Dipartimento di Chimica e Chimica Industriale, Università di Genova, Genova, Italy

FM-1:IL24 **Segregation Tendencies in Heusler Alloys from First Principles**
V.V. SOKOLOVSKIY[1], M.E. GRUNER[2], P. ENTEL[2], M. ACET[2], V.D. BUCHELNIKOV[1], [1]Faculty of Physics, Chelyabinsk State University, Chelyabinsk, Russia; [2]Faculty of Physics and Center for Nanointegration, CENIDE, University of Duisburg-Essen, Duisburg, Germany

FM-1:L25 **Research of the Aging Process of TiNi Alloy in Coarse-grained and Ultrafine-grained States**
A.A. CHURAKOVA, E.M. KAYUMOVA, Institute of Molecule and Crystal Physics - Subdivision of the Ufa Federal Research Center of the Russian Academy of Sciences, Ufa State Aviation Technical University, Ufa State Petroleum Technological University, Ufa, Russia

Session FM-2
Thin films and micro nano-systems

FM-2:IL01 **Shell Ferromagnetism**
M. ACET[1], A. CAKIR[2], M. FARLE[1], [1]Physics Faculty, Duisburg-Essen University, Duisburg, Germany; [2]Department of Metallurgical and Materials Engineering, Muğla Sıtkı Koçman University, Muğla, Turkey

FM-2:IL02 **Microstructure Engineering of Magnetic Shape Memory Thin Films and Nanostructures**
F. CASOLI, M. TAKHSHA GHAHFAROKHI, L. NASI, S. FABBRICI, R. CABASSI, G. TREVISI, F. ALBERTINI, IMEM - CNR, Parma, Italy; J.A. ARREGI, M. STANO, M. HORKY, J. HAJDUCEK, V. UHLIR, CEITEC BUT, Brno, Czech Republic; A. CHIRKOVA, F. MACCARI, Functional Materials, TU Darmstadt, Darmstadt, Germany

FM-2:IL03 **Epitaxial NiTi Thin Films: Growth, Microstructure and Martensitic Phase Transition**
K. LÜNSER[1, 2, 3], S. SCHWABE[1], K. NIELSCH[1, 2], S. FÄHLER[3], [1]Leibniz IFW Dresden, Institute for Metallic Materials, Dresden, Germany; [2]Institute of Materials Science, TU Dresden, Dresden, Germany; [3]Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, Dresden, Germany

FM-2:L04 **Shape-memory Heusler Films Towards Nanoscale by Lithography Patterning**
M. TAKHSHA, G. TREVISI, L. NASI, F. CASOLI, F. ALBERTINI, IMEM-CNR, Parma, Emilia-Romagna, Italy; J.A. ARREGI, M. HORKÝ, V. UHLÍR, CEITEC BUT, Brno University of Technology, Brno, South Moravian, Czech Republic

FM-2:IL05 **Size Effects in Ferromagnetic Shape Memory Alloys: Foams, Microwires and Particles**
XUEXI ZHANG, M. QIAN, School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China

FM-2:L06 **The Impact of the Interaction between Twin Microstructures and Magnetic Domain Patterns on the Magneto-mechanics of Magnetic Shape Memory Alloys**
P. MÜLLNER, M. VELIGATLA, Boise State University, Boise, ID, USA; A. HOBZA, SpaceX C.J. GARCÍA-CERVERA, University of California Santa Barbara & Basque Center for Applied Mathematics

Session FM-3
SMAS engineering and applications

FM-3:IL01 **3D Reconstitution and Numerical Analysis of Thermo-mechanical Behavior of Porous and Cellular Shape Memory Alloys**
T. BEN ZINEB[1], R. XU[1, 2], S. ZHU[3], C. CISSÉ[4], R. NISHANT[3], C. BOUBY[1], A. CHEROUAT[3], H. ZAHROUNI[1], H. HU[2], W. ZAKI[4], [1]Université de Lorraine, CNRS, Arts et Métiers Paris Tech, LEM3, Nancy, France; [2]School of Civil Engineering, Wuhan University, Wuchang, Wuhan, China; [3]University of Technology of Troyes, ICD/GAMMA3, Troyes, France; [4]Khalifa University of Science and Technology, Abu Dhabi, UAE

FM-3:IL02 **NiTi Surfaces for Minimally Invasive Medical Devices**
A. UNDISZ, Friedrich-Schiller-Universität, Jena, Germany

FM-3:L03 **Finite Element Analysis of Mechanical Behavior of Porous Parts 3D Printed from NiMnGa Magnetic Shape Memory Alloy Powders**
C.V. SOLOMON[1], E. MYERS[1], R. VANNUTELLI[1], S. ISACCO[1], M.P. CAPUTO[2], [1]Rayen School of Engineering, Youngstown State University, Youngstown, USA; [2]Department of Science, Penn State Shenango, Sharon, PA, USA

FM-3:L04 **Thermomagnetic Thin Film Energy Harvester**
J. JOSEPH, M. KOHL, Karlsruhe Institute of Technology (KIT), Institute of Microstructure Technology (IMT), Karlsruhe, Germany; M. OHTSUKA, Institute of Multidisciplinary Research for Advanced Matls, Tohoku University, Sendai, Japan; H. MIKI, Institute of Fluid Science, Tohoku University, Sendai, Japan

FM-3:L05 **Investigation of the Damping Properties of Innovative NiTi Elements: Development of Proof of Concept and Demonstrators**
F. VILLA[1], E. BASSANI[1], G. DE CEGLIA[2], T. CLAUDE PARKEL[3], F. PASSARETTI[1], S. VISCUSO[4], E. VILLA[1], [1]National Research Council - Institute of Condensed Matter Chemistry and Technologies for Energy (CNR ICMATE), Lecco, Italy; [2]Technosprings Italia Srl, Besnate (VA), Italy; [3]CSEM - Centre Suisse d'Electronique et de Microtechnique, Landquart (GR), Switzerland; [4]TSS InnovationProjekte GmbH, Roveredo (GR), Switzerland

FM-3:L06 **Shape Memory Alloy Torsion Drive Operation Temperatures Optimization**
A.V. SIBIREV, S.P. BELYAEV, N.N. RESNINA, Saint-Petersburg State University, Saint-Petersburg, Russia

FM-3:IL07 **Smart Structures with Embedded NiTi Actuators for Aerospace Applications**
P. BETTINI, D. RIGAMONTI, Department of Aerospace Science and Technology, Politecnico di Milano, Milan, Italy

FM-3:IL08 **Thermomagnetic Materials for Harvesting Low Temperature Waste Heat**
D. DZEKAN[1], A. WASKE[2], K. NIELSCH[1], S. FÄHLER[3], [1]Leibniz IFW Dresden, Institute for Metallic Materials, TU Dresden, Institute for Material Science, Dresden, Germany; [2]BAM, Berlin, Germany; [3]Leibniz IFW Dresden, Institute for Metallic Materials, Dresden, Germany

FM-3:IL09 **Development of Tube-based Structures to be Applied in Durable and Efficient Elastocaloric Cooling Device**
S. DALL'OLIO, A. ŽEROVNIK, L. PORENTA, Ž. AHČIN, J. CERAR, P. KABIRIFAR, **J. TUŠEK**, Faculty of Mechanical Engineering, University of Ljubljana, Ljubljana, Slovenia

SYMPOSIUM FN

SMART AND INTERACTIVE TEXTILES - FROM NANO-ENGINEERED TEXTILE FIBRES TO INTEGRATED WEARABLE SYSTEMS

Session FN-1
Adaptive/Active Textiles

FN-1:IL01 **Textile Actuation - Its Mechanisms, Potentials and Challenges**
N.-K. PERSSON[1, 2], C. BACKE[1], M. ASADI MIANKAFSHE[1], T. BASHIR[1, 3], E. JAGER[4], L. GUO[1], [1]The Swedish School of Textiles, Polymeric E-textiles, University of Borås, Borås, Sweden; [2]Smart Textiles Technlogy Lab, Smart Textiles, University of Borås, Borås, Sweden; [3]Swedish Centre for Resource Recovery, University of Borås, Borås, Sweden; [4]Linköping University, Department of Physics, Chemistry and Biology (IFM), Sensor and Actuator Systems, Linköping, Sweden

FN-1:IL02 **Light Emitting Textiles: Innovative Product Development and Novel Functionality through Collaborative Manufacture and Co-design**
S. ROBERTSON, Royal College of Art, London,UK; **S. TAYLOR**, Edinburgh Napier University, Edinburgh, UK

FN-1:IL03 **Nanogenerator - Energy Harvesting and Delivery for Self-powered Human Interface Devices**
SANG-WOO KIM, Sungkyunkwan University (SKKU), Suwan, South Korea

FN-1:L04 **In Air Rotational Twisted Yarn Actuator for Haptics**
S. MEHRAEEN[1], E.W.H. JAGER[1], D. MELLING[2], C. PLESSE[3], N.K. PERSSON[4], [1]Bionics and Transduction Science, Department of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden; [2]School of Engineering and Materials, Queen Mary University, Mile End Road, London, UK; [3]Laboratoire de Physico-chimie des Polymères et des Interfaces (LPPI), EA2528, CY Cergy Paris Université, Cergy, France; [4]Swedish School of Textiles, Smart Textiles, Polymeric E-textiles, University of Borås, Borås, Sweden

Session FN-2
e-Textiles

FN-2:KL **Intelligent Wearable Systems Integrated with Smart Textiles and Artificial Intelligence**
XIAOMING TAO, Research Institute for Intelligent Wearable Systems, Hong Kong Polytechnic University, Kowloon, Hong Kong, China

FN-2:IL01 **Energy Harvesting and Storage with Electronic Textiles**
A. SATHARASINGHE, **T. HUGHES-RILEY**, T. DIAS, Advanced Textiles Research Group, School of Art & Design, Nottingham Trent University, Nottingham, UK

FN-2:IL02 **Nanostructured Coatings for the Functionalization of Textiles**
M. AVELLA[1], R. AVOLIO[1], R. CASTALDO[1], M. COCCA[1], F. DE FALCO[1], M.E. ERRICO[1], M. LAVORGNA[2], **G. GENTILE**[1], [1]Institute for Polymers Composites and Biomaterials - National Research Council of Italy, Pozzuoli (NA), Italy; [2]Institute for Polymers Composites and Biomaterials - National Research Council of Italy, Portici (NA), Italy

FN-2:IL03 **The Integration of Electronic Sensors and Systems into Textiles to Create the Next Generation of E-Textiles**
R. TORAH, A. KOMOLAFE, K. YANG, Y. LI, J. TUDOR, S. BEEBY, University of Southampton, Southampton, UK

FN-2:IL04 **A Hybrid Textile Electrode for Simultaneous Wireless ECG and Body Motion Measurement**
G.K. STYLIOS, XIANG AN, Heriot Watt University, Research Institute for Flexible Materials, Galashiels, Selkirkshire, UK

FN-2:IL05 **Bioelectronic Textiles: Materials and Systems**
E. ISMAILOVA, Department of Bioelectronics, Ecole Nationale Supérieure des Mines de Saint Etienne, CMP-EMSE, MOC, Gardanne, France

FN-2:IL06 **Ultra-safe Weavable 1D Batteries for Wearable Electronics**
NIAN LIU, School of Chemical and Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, USA

FN-2:IL07 **Wearable Sensors Based on Nano-carbon Composites and Networks**
A. DALTON, University of Sussex, Brighton, UK

FN-2:IL08 **Smart Textiles with Powering and Sensing Abilities based on Fiber and Fabric Triboelectric Nanogenerators**
KAI DONG, Beijing Institute of Nanoenergy and Nanosystems, CAS, Beijing, China

FN-2:IL09 **Exotic Functional e-textiles from Surface-area-enlarged Supercapacitor Yarns to Flexible Superconductor Yarns Using Carbon-nanotube Sheets as a Template**
DONGSEOK SUH, Department of Energy Science, Sungkyunkwan University, Suwon, South Korea

FN-2:IL10 **Seamless and Reliable Integration of Electronics and Sensors in Textiles**
S.P. BEEBY, A.O. KOMOLAFE, R.N. TORAH, M.J. TUDOR, M. LI, H. NUNES-MATOS, School of Electronics and Computer Science, University of Southampton, Southampton, UK; D. HARDY, T. DIAS, Advanced Textiles Research Group, School of Art & Design, Nottingham Trent University, Nottingham, UK

FN-2:IL11 **Thin-film Electronics on Large-area Plastic Substrates for e-textiles**
N. MÜNZENRIEDER, Faculty of Science and Technology, Free University of Bozen-Bolzano, Bozen, Italy

Session FN-3
Functionality, Manufacturing, Application

FN-3:IL01 **Finishing Treatments of Synthetic Fabrics to Reduce Microplastic Release During Washings**
M. COCCA, F. DE FALCO, G. GENTILE, R. AVOLIO, M.E. ERRICO, E. DI PACE, M. AVELLA, Institute for Polymers, Composites and Biomaterials, National Research Council of Italy, Pozzuoli, NA, Italy

FN-3:IL02 **Advances in Wearable Photovoltaic Fabrics**
YONG K. KIM, University of Massachusetts Dartmouth, North Dartmouth, MA, USA

FN-3:L03 **Nanocomposite Motion Tape Sensors for Functional Movement Assessment**
Y.-A. LIN, X. ZHAO, S.-C. HUANG, **K.J. LOH**, Department of Structural Engineering, University of California San Diego, La Jolla, CA, USA

FN-3:L04 **Dual, One-step, Integration of Sensing and Actuation in 2D Flexible Structures by Weaving Assembly**
C. BACKE[1], J.G. MARTINEZ[2], L. GUO[1], E. JAGER[2], N-K. PERSSON[1, 3], [1]The Swedish School of Textiles, Polymeric E-textiles, University of Borås, Borås, Sweden; [2]Linköping University, Department of Physics, Chemistry and Biology (IFM), Sensor and Actuator Systems, Linköping, Sweden; [3]Smart Textiles Technology Lab, Smart Textiles, University of Borås, Borås, Sweden

FN-3:IL05 **Electrospun Nanofibers as designed 3D-structures for Nanomedicine**
I. BONADIES, Institute for Polymers, Composites and Biomaterials (IPCB)-CNR, Pozzuoli (NA), Italy

FN-3:IL06 **Digital Printing for Functional and Smart Textiles**
V. NIERSTRASZ, J. YU, S. SEIPEL, R. HASHEMI SANATGAR, V. MALM, Textile Materials Technology, Department of Textile Technology, The Swedish School of Textiles Faculty of Textiles, Engineering and Business, University of Borås, Borås, Sweden

FN-3:IL07 **Integrating Printed Electronics into Fashion, Sport and Leisure Garments**
A. CLAYPOLE, J. CLAYPOLE, **T. CLAYPOLE**, Welsh Centre for Printing and Coating, College of Engineering, Swansea University Bay Campus, Crymlyn Burrows, Swansea, UK

FN-3:IL08 **E-Textiles Technologies and Application - Uniting Electronics and Textiles**
M. VON KRSHIWOBLOZKI, C. KALLMAYER, C. DILS, Fraunhofer IZM, Berlin, Germany; M. SCHNEIDER-RAMELOW, TU Berlin, Berlin, Germany

SYMPOSIUM FO
EMBODYING INTELLIGENCE IN STRUCTURES AND INTEGRATED SYSTEMS

Session FO-1
Smart Materials/Sensors/Actuators/MEMs/NEMs

FO-1:IL01 **Nonlinear Dynamics, Stabilization and Control of Nano- and Micro- Electromechanical Systems**
O. GOTTLIEB, Mechanical Engineering Nonlinear and Chaotic Dynamical Systems Group, Technion - Israel Institute of Technology, Haifa, Israel

FO-1:IL02 **Modelling and Simulation of Electro-active Materials**
A. HUMER, A. PECHSTEIN, **M. KROMMER**, Institute of Technical Mechanics, JKU Linz, Linz, Austria

FO-1:L03 **Large Deformation and Hysteresis in Non-linear Electro-mechanics**
A. HUMER, A. PECHSTEIN, M. KROMMER, Institute of Technical Mechanics, Johannes Kepler University, Linz, Austria

FO-1:L04 **Indoor Organic Cells (IOC) Modeling and Identification for Light-Fidelity (LiFi) Communications**
M. PARENT, M. PASQUINELLI, L. ESCOUBAS, J-J. SIMON, Aix Marseille Université, Université de Toulon, CNRS, IM2NP, Marseille, France; G. CHABRIEL, J. BARRERE, Université de Toulon, Aix Marseille Université, CNRS, IM2NP, Marseille, France; S. BEN DKHIL, B. CRUCHON, H. ALKHATIB, F. ARCHET, Dracula Technologies, Valence, France

FO-1:IL05 **Experimental Characterization of a Smart Material via DIC**
S. CASCIATI, D. BORTOLUZZI, SIART srl, Pavia, Italy

FO-1:IL06 **Optimization of Stiffness Profile for Bio-inspired Propulsion**
M.R. HAJJ, Civil, Environmental and Ocean Engineering, Stevens Institute of Technology, NJ, USA; V. MEESALA, Engineering Mechanics Program, Virginia Tech, VA, USA

FO-1:IL07 **Towards Earthquake-resilient Structures by using Superelastic Shape Memory Alloys**
SONGYE ZHU, Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hong Kong, China

Session FO-2
Integration technologies

FO-2:IL01 **On the Use of Gyroscope and Accelerometer Sensors for Direct Displacement Measurements**
YIZHENG LIAO, **A.S. KIREMIDJIAN**, K. BALAFAS, R. RAJAGOPAL, Stanford University, Stanford, CA, USA; H.-C. LOH, University of California San Diego, USA

FO-2:IL02 **The Smart Potential of Vision-based Technology**
L. FARAVELLI, Zhejiang University, Hangzhou, China; D. BORTOLUZZI, SIART srl, Pavia, Italy

FO-2:IL03 **Control of Random Rocking Dynamics of Multidimensional Structures**
A.S. KOVALEVA, Space Research Institute, RAS, Moscow, Russia

FO-2:IL04 **Integration of Computer Vision with Deep Learning for Structural Health Monitoring and Condition Assessment**
XIAO-WEI YE, T. JIN, Department of Civil Engineering, Zhejiang University, Hangzhou, China

FO-2:IL05 **Simulation of Bending of a Plate Consisting of Shape Memory and Elastic-plastic Layers under Thermocycling after Preliminary Bending or Stretching**
A.E. VOLKOV, N.A. VOLKOVA, E.A. VUKOLOV, Saint-Petersburg State University, Saint-Petersburg, Russia

Session FO-3
Smart structures and integrated systems

FO-3:L01 **Efficient Method for Optimal Sensor Placement in Large-scale Structures**
M. OSTROWSKI, B. BLACHOWSKI, A. SWIERCZ, P. TAUZOWSKI, Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland; P. OLASZEK, Road and Bridge Research Institute, Warsaw, Poland; L. JANKOWSKI, Institute of Fundamental Technological Research, Polish Academy of Sciences, Poland

FO-3:L02 **Semi-active Decentralized Vibration Damping Strategy in Two-dimensional Frame Structures**
B. POPLAWSKI, G. MIKUŁOWSKI, Ł. JANKOWSKI, Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland

FO-3:L03 **Structural Glass Panels: an Integrated System**
G. BIDINI, L. BARELLI, C. BURATTI, G. CASTORI, E. BELLONI, **E. SPERANZINI**, University of Perugia, Department of Engineering, Perugia, Italy

FO-3:IL04 **Adaptive Stiffness Structural Systems: State of the Art and Practice**
S. NAGARAJAIAH, Rice University, Houston, TX, USA

FO-3:IL05 **Advances in Wind Engineering for Resilient Communities**
A. KAREEM, NatHaz Modeling Laboratory, University of Notre Dame, Notre Dame, IN, USA

FO-3:IL06 **Intelligent Systems in Infrastructure Engineering**
M.P. SINGH, Department of Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, VA, USA

FO-3:L07 **State-of-the-Art Wayside Monitoring Techniques for Highspeed Railway Systems**
L. ZHOU, Y.Q. NI, Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong, China

Session FO-4
Ongoing and perspective applications

FO-4:IL01 **Provisions for Passive Control Devices in the New Eurocode 8**
C.Z. CHRYSOSTOMOU, Cyprus University of Technology, Limassol, Cyprus

FO-4:IL02 **Some Aspects in Managing Smart Cities**
R. DE LOTTO, University of Pavia, Department of Civil Engineering and Architecture, Pavia, Italy

FO-4:L03 **Monitoring the Building Response during Borehole Excavation**
D. BORTOLUZZI, M. FRANCOLIN, SIART srl, Pavia, Italy

FO-4:IL04 **Challenges toward the Enhancement of Seismic Resilience for Tokyo Metropolitan Area**
AKIRA NISHITANI[1], K. KAJIWARA[2], T. NAGAE[3], T. INOUE[2], K. KUSUNOKI[4], I. NAKAMURA[2], K. HAYASHI[5], M. KURATA[6], Y. KAWAMATA[2], E. SATO[2], [1]Waseda University, Tokyo, Japan; [2]NIED, Japan; [3]Nagoya University, Japan; [4]University of Tokyo, Japan; [5]Toyohashi University of Technology, Japan; [6]Kyoto University, Japan

FO-4:IL05 **Rail Bolt Joint Looseness Monitoring Using PZT Sensing Network**
LU ZHOU[1,2], **YI-QING NI**[1,2], [1]Hong Kong Branch of National Transit Electrification and Automation Engineering Technology Research Center, The Hong Kong Polytechnic University, Hong Kong, China; [2]Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hong Kong, China

FO-4:IL06 **Variational Bayesian Inference for Sparse Damage Identification of Structures**
YONG XIA, XIAOYOU WANG, The Hong Kong Polytechnic University, Kowloon, Hong Kong; XIAOQING ZHOU, Shenzhen University, China

FO-4:IL07 **Integration of Identification and Vibration Control of Time-Varying Structures under Unknown Seismic Excitations**
YING LEI, JUBIN LU, JINSHAN HUANG, School of Architecture and Civil Engineering, Xiamen University, Xiamen, China

Special Session FO-5
Workshop on "Autonomic, Adaptive and Self-Sustaining Systems: Future Perspectives"

FO-5 **Multifunctional Design of Autonomic, Adaptive and Self-sustaining Systems: An Overview**
B.-L. ("LES") LEE, Air Force Office of Scientific Research, Arlington, VA, USA

FO-5 **Biological Blueprints Towards Next Generation Multiscale Composites**
A. POHL[1], T. WANG[1], W. HUANG[1], P. ZAVATTIERI[2], **D. KISAILUS**[1], [1]University of California, Riverside, CA, USA; [2]Purdue University, USA

FO-5 **Powerful, Large Stroke Electrochemical Carbon Nanotube Yarn Artificial Muscles and their Use for Energy Harvesting**
R.H. BAUGHMAN, University of Texas at Dallas, Dallas, TX, USA

FO-5 **An Active Mechanical Willis Metamaterial with Asymmetric Polarizabilities**
G. HUANG, University of Missouri, Columbia, MO, USA

FO-5 **Towards Morphogenic Manufacturing: Reaction-diffusion Driven Structure in Thermoset Polymeric Materials**
N. SOTTOS, University of Illinois Urbana Champaign, Urbana, IL, USA

FO-5 **Developing a Virtual Damage Sensor Using a Coupled Electro-mechanical FE Model of a Piezoelectric Material**
S. GHOSH, P. TARAFDER, S. DAN, Johns Hopkins University, Baltimore, MD, USA

FO-5 **Smart Skin for Robots**
C. LIU[1], X. CHEN[1], T. TOPAC[2], **F.K. CHANG**[2], [1]Department of Mechanical Engineering, Stanford University, Stanford, CA, USA; [2]Department of Aeronautics and Astronautics, Stanford University, Stanford, CA, USA

FO-5 **Biohybrid Systems for Morphing**
D. LENTINK, University of Groningen, Groningen, The Netherlands

FO-5 **Towards a Fly-by-Feel Morphing Wing using Reinforcement Learning**
K.P.T. HAUGHN, **D.J. INMAN**, University of Michigan, Ann Arbor, MI, USA

FO-5 **Multistable Morphing Skins Enabled by Additive Manufacturing**
J. BAUR, University of Illinois Urbana-Champaign, Urbana, IL, USA

FO-5 **Multi-functional Structures Technologies for Aerospace Applications - Status and Future**
J. KUDVA, NextGen Aeronautics, Torrance, CA, USA

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

Session FP-1
Classes of materials and their (bio)synthesis, structure and chemical modification

FP-1:IL01 **Living Materials - Technology of the Future from Forms of the Past**
F. OMENETTO, Silklab, Laboratory for Living Devices, Tufts University, Medford, MA, USA

FP-1:IL02 **Remote Activation of Intracellular Pathways using Magnetic Nanoparticles and Cadherins**
P. GOMOLLÓN-ZUECO[1], C. CASTRO[1], J.M. DE LA FUENTE[1, 2], R.M. FRATILA[1, 2], P. MARTÍNEZ-VICENTE[1], **M. MOROS**[1, 2], [1]Instituto de Nanociencia y Materiales de Aragón (INMA), CSIC-Universidad de Zaragoza, Zaragoza, Spain; [2]Centro de Investigación Biomédica en Red de Bioingeniería, Biomateriales y Nanomedicina (CIBER), Spain

FP-1:IL03 **Photosynthetic Enzymes for Energy Conversion**
R. RAGNI, G. BUSCEMI, D. VONA, A. AGOSTIANO, G.M. FARINOLA, Chemistry Department, University of Bari Aldo Moro, Bari, Italy; F. MILANO, M. TROTTA, IPCF CNR, UOS Bari, Bari, Italy

FP-1:IL04 **Organic Bioelectronics from a Molecular Design Perspective**
C. NIELSEN, Queen Mary University of London, London, UK

FP-1:L05 **Surface-specific Polymerization and Deposition of Dopamine: a Novel Mussel-inspired Coating Technology**
M.L. ALFIERI, M. D'ISCHIA, Dept. of Chemical Sciences, University of Naples Federico II, Naples, Italy; M. MASSARO, S. RIELA, Department of Biological, Chemical and Pharmaceutical Sciences and Technologies (STEBICEF), University of Palermo, Palermo, Italy

FP-1:IL06 **Biomimetic Surfaces as Facilitator for a Clean Environment**
H. HÖLSCHER, Karlsruhe Institute of Technology (KIT), Eggenestein-Leopoldshafen, Germany

FP-1:L07 **Recyclable MOF-based Biocatalysts**
R. RICCO, Asian Institute of Technology, Pathum Thani, Thailand

Session FP-2
Electronic devices with biological and bio-inspired materials

FP-2:IL01 **Designing Biomimetic Electronic Interfaces**
F. SANTORO, Tissue Electronics, Istituto Italiano di Tecnologia, Naples, Italy

FP-2:IL02 **Plant Based Biohybrid Systems**
E. STAVRINIDOU, Laboratory of Organic Electronics, Department of Science and Technology, Linköping University, Norrköping, Sweden

FP-2:IL03 **Bacterial Photosynthetic Reaction Centers in Optoelectronic Devices**
F. MILANO, CNR-ISPA Institute of Sciences of Food Production, Lecce, Italy; M. TROTTA, CNR IPCF Institute for Physical and Chemical Processes, Bari, Italy; R. RAGNI, D. VONA, G. BUSCEMI, G.M. FARINOLA, Chemistry Department, University of Bari Aldo Moro, Bari, Italy

FP-2:IL04 **Silk Protein for Opto-electronic Skin Devices**
SUNGHWAN KIM, Department of Physics & Department of Energy Systems Research, Ajou University, Suwon, South Korea

FP-2:IL05 **Interfacing Photosynthetic Enzymes with Newly Designed Transparent Electrode Materials**
J. KARGUL, Solar Fuels Laboratory, Centre of New Technologies, University of Warsaw, Warsaw, Poland

FP-2:IL06 **Biological-organic Biohybrid Systems Interfaced with Electrodes**
D. VONA[1], G. BUSCEMI[1, 2], R. LABARILE[1, 2], R. RAGNI[1], F. MILANO[2], **M. TROTTA**[2], [1]Dipartimento di Chimica, Università di Bari, Bari, Italy; [2]Istituto per i Processi Chimico Fisici, Consiglio Nazionale delle Ricerche, Bari, Italy

FP-2:IL07 **Nanomaterial Engineering and Bioengineering of Living Photovoltaics for Enhanced Performance**
A. BOGHOSSIAN, EPFL, Lausanne, Switzerland

FP-2:IL08 **Stretchable and Healable Bioelectronic Materials**
F. CICOIRA, Polytechnique Montreal, Montreal, Canada

FP-2:IL09 **The Electrochemical Domain of Bacterial Photosynthesis**
G. BUSCEMI[1, 2], D. VONA[1], P. STUFANO[3], R. LABARILE[1, 2], **M. GRATTIERI**[1, 2], [1]Università degli Studi di Bari "Aldo Moro", Bari, Italy; [2]Consiglio Nazionale delle Ricerche IPCF-CNR, Bari, Italy; [3]Consiglio Nazionale delle Ricerche CNR-NANOTEC, Bari, Italy

FP-2:IL10 **A New in Vivo Model for Bioelectronics**
C. TORTIGLIONE, Istituto di Scienze Applicate e Sistemi Intelligenti, Consiglio Nazionale delle Ricerche, Pozzuoli, Italy

FP-2:IL11 **The Mammalian Eumelanin Pigment as Novel (Bio)Material for Applications in Energy Conversion**
A. PEZZELLA, Department of Physics "Ettore Pancini", University of Naples "Federico II," Naples, Italy; Institute for Polymers, Composites and Biomaterials (IPCB), CNR, Pozzuoli, Italy; National Interuniversity Consortium of Materials Science and Technology (INSTM), Florence, Italy

Session FP-3

Photonic devices with biological and bio-inspired materials

FP-3:IL01 **Measuring Cellular Dynamics with Microlaser-based Sensors**
M. SCHUBERT[1], L. WOOLFSON[1], I.R.M. BARNARD[1], A.M. DORWARD[2], B. CASEMENT[1], A. MORTON[1], G.B. ROBERTSON[2], G.B. MILES[3], C.S. TUCKER[4], S.J. PITT[2], **M.C. GATHER**[1, 5], [1]SUPA, School of Physics and Astronomy, University of St Andrews, UK; [2]School of Medicine, University of St Andrews, UK; [3]School of Psychology & Neuroscience, University of St Andrews, UK; [4]The Queen's Medical Research Institute, University of Edinburgh, UK; [5]Centre for NanoBioPhotonics, Dept. für Chemie, University of Cologne, Köln, Germany

FP-3:IL02 **Photosynthesis Enhancement in Diatom Microalgae by Photoactive Molecules**
C. D'ANDREA[1, 2], G. LEONE[3], G. DE LA CRUZ VALBUENA[1, 2], S.R. CICCO[3], D. VONA[3], E. ALTAMURA[3], R. RAGNI[3], E. MOLOTOKAITE[2], M. CECCHIN[4], S. CAZZANIGA[4], M. BALLOTTARI[4], G. LANZANI[1, 2], G.M. FARINOLA[3], [1]Department of Physics, Politecnico di Milano, Milano, Italy; [2]Center for NanoScience and Technology @PoliMi, Istituto Italiano di Tecnologia, Italy; [3]Department of Chemistry University of Bary, Italy; [4]Department of biotechnology, University of Verona, Italy

FP-3:IL03 **Engineering of Nanostructed Materials through Cellulose Mineralization**
I. POSTNOVA, **Y. SHCHIPUNOV**, Institute of Chemistry, Russian Academy of Sciences, Vladivostok, Russia

FP-3:L04 **Bioinspired Hydrogel Structures for Responsive Photonics**
C. DELANEY[1], J. QIAN[2], L. BRADLEY[2], L. FLOREA[1], [1]School of Chemistry & AMBER, the SFI Research Centre for Advanced Materials and BioEngineering Research, Trinity College Dublin, Ireland; [2]School of Physics and AMBER, Trinity College Dublin, College Green, Dublin, Ireland

FP-3:IL05 **Engineering Hierarchical Architectures for Bio-inspired Photonics**
N. STINGELIN, Georgia Institute of Technology, Atlanta, GA, USA

FP-3:IL06 **Bio-inspired Polymer Nanostructures for Photonics: Novel Opportunities from Lasing to Sensing**
D. COMORETTO, P. LOVA, Dipartimento di Chimica e Chimica Industriale, Università di Genova, Genova, Italy

FP-3:IL07 **Biomimetic Colour Engineering Form Nature to Applications**
S. VIGNOLINI, Department of Chemistry, University of Cambridge, Cambridge, UK

FP-3:IL08 **Hybrid Plasmonic/Photonic Crystals for Optical Detection of Bacterial Contaminants**
G.M. PATERNÒ[1], L. MOSCARDI[1, 2], S. DONINI[1], D. ARIODANTI[3], I. KRIEGEL[4], E. PARISINI[1], G. LANZANI[1, 2], F. SCOTOGNELLA[1, 2], [1]Center for Nano Science and Technology@PoliMi, Istituto Italiano di Tecnologia, Milano, Italy; [2]Dipartimento di Fisica, Politecnico di Milano, Milano, Italy; [3]Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Milano, Italy; [4]Department of Nanochemistry, Istituto Italiano di Tecnologia (IIT), Genova, Italy

FP-3:IL09 **Multifunctional Optical Materials in Nature: Responsive Photonic Structures and the Role of Scale Geometry and Disorder**
B. WILTS, University of Salzburg, Salzburg, Austria

Session FP-4

Bio-medical devices with biological and bio-inspired materials

FP-4:IL01 **Novel Biomaterial and Quantum Dot Integrated Optoelectronic Neural Interfaces**
S. NIZAMOGLU, Department of Electrical and Electronics Engineering, Koç University, Istanbul, Turkey

FP-4:IL02 **Functional Nanomaterials and their Applications in the Therapy of Cancer and Infectious Diseases**
M. HÉMADI, France Laboratoire ITODYS, Université de Paris, CNRS-UMR 7086, Paris Cedex, France

FP-4:L03 **Antibacterial Structures Inspired by Cicada Wings**
A.M. BÜRGER, R.W. VAN NIEUWENHOVEN, L.L.E. MEARS, K. WHITMORE, **I.C. GEBESHUBER**, Vienna University of Technology, Vienna, Austria; C. SIMON, D.C. MARSHALL, University of Connecticut, USA; P. KIENZL. A. ELBE-BÜRGER, Medical University of Vienna, Austria

FP-4:IL04 **Mechano-responsive Color-changing Photonic Materials: Scalable Manufacture for Wearables and Medical Textiles**
M. KOLLE, Massachusetts Institute of Technology, Cambridge, MA, USA

FP-4:IL05 **Nature Inspired Design of Bioactive Antimicrobial Materials**
G. LUCIANI, University of Naples Federico II, Dept. DICMaPI - Dept. Chemical, Materials and Industrial Production Engineering, Naples, Italy

FP-4:IL06 **Bioelectronics to Study and Regenerate Bone**
Y. FU, F. SANTORO, S. CARTMELL, D. WIDERA, R.M. OWENS, D. IANDOLO, Department of Chemical Engineering and Biotechnology, University of Cambridge, UK; F. SANTORO, IIT, Naples, Italy; S. CARTMELL, University of Manchester, UK; D. WIDERA, School of Pharmacy, University of Reading, UK; **D. IANDOLO**, INSERM, U1059 Sainbiose, Université Jean Monnet, Mines Saint-Étienne, Université de Lyon, Campus Santé Innovation, Saint-Étienne, France

FQ - 13th International Conference

ADVANCED BIOMATERIALS AND NANO-BIOTECHNOLOGY FOR MEDICINE

FQ:KL **Coming to Age with Nanomedicine: Progress and Disappointments Over the Past 30 Years**
T.J. WEBSTER, CSA, Interstellar Therapeutics, USA; Professor, Vellore Institute of Technology, India and Hebei University of Technology, China

Session FQ-1

Advances in Biomaterials

FQ-1:IL01 **In Vitro Assessment of Ion-doped Bioactive Glasses for Bone Tissue Engineering: Silicate vs Silicon Oxycarbide-based Systems**
A.R. BOCCACCINI[1], M. ARANGO-OSPINA[1], F. XIE[2], R. RIEDEL[2], I. GONZALO-JUAN[2], E. IONESCU[2], [1]Institute of Biomaterials, University of Erlangen-Nuremberg, Erlangen, Germany; [2]Institute for Materials Science, Technische Universität Darmstadt, Darmstadt, Germany

FQ-1:IL02 **Mechanically-interlocked Macromolecules Exploring Frontier in Biomaterials**
NOBUHIKO YUI, A. TAMURA, Y. ARISAKA, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo, Japan

FQ-1:IL03 **The Processing and Application of Controlled Porous Bioceramic Materials Based on Calcium Phosphates Doped with Different Cations**
Dj. VELJOVIC, R. PETROVIC, Dj. JANACKOVIC, Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia; V. UGRINOVIC, T. MATIC, Innovation Center of the Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia

FQ-1:IL04 **3D Printing of Biocompatible Ceramic Nanocomposites via Genipin-Chitosan Crosslinking**
J. MAINARDI, K. REZWAN, **M. MAAS**, Advanced Ceramics, University of Bremen, Bremen, Germany

FQ-1:IL05 **Nanomaterials with Tunable Properties for Drug Delivery**
S. MAJD, University of Houston, Biomedical Engineering, Houston, TX, USA

FQ-1:L06 **Physicochemical Study of a Calcium Carbonate-chitosan Composite Cement as a Potential Bone Substitute Material**
E. TOUFIK[1, 2, 3], H. NOUKRATI[2], C. REY[4], H. BEN YOUCEF[1], A. BARROUG[2, 3], C. COMBES[4], [1]Mohammed VI Polytechnic University (UM6P), HTMR-Lab, Benguerir, Morocco; [2]Mohammed VI Polytechnic University (UM6P), High Institute of Biological and Paramedical Sciences, ISSB-P, Benguerir, Morocco; [3]Cadi Ayyad University, Faculty of Sciences Semlalia, Marrakech, Morocco; [4]CIRIMAT, Université de Toulouse, CNRS, Toulouse INP-ENSIACET, Toulouse, France

FQ-1:L07 **New Bioactive Glasses with Therapeutic Ions to Tailor Specific Functionalities**
D. BELLUCCI, **V. CANNILLO**, Dipartimento di Ingegneria "E. Ferrari" Università di Modena e Reggio Emilia, Modena, Italy

FQ-1:L08 **The 5th Power Law Heat Response of ZnMn Ferrite Nanoparticles to the Magnetic Field**
N.N. LIU, A.P. PYATAKOV, M.V. Lomonosov Moscow State University, Moscow, Russia; M.N. ZHARKOV, N.A. PYATAEV, National Research Ogarev Mordovia State University, Saransk, Russia; G.B. SUKHORUKOV, School of Engineering and Materials Science, Queen Mary University of London, London, UK/ Skolkovo Institute of Science and Technology, Moscow, Russia; A.M. TISHIN, M.V. Lomonosov Moscow State University, Moscow, Russia/ AMT&C Group, Troitsk, Russia

FQ-1:IL09 **Functionalisation of Surfaces in Porous Ceramic Structures and 3D Flow Visualization**
K. REZWAN, University of Bremen, Advanced Ceramics, Bremen, Germany

FQ-1:IL10 **Integration of Supermolecule-based Biointerfaces and Growth Factors to Manipulate Cell Functions**
YOSHINORI ARISAKA, N. YUI, Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Chiyoda, Tokyo, Japan

FQ-1:IL11 **Isothermal Shape Change by Enzymatic Trigger**
P.T. MATHER, Penn State University, University Park, PA, USA; J.H. HENDERSON, S.L. BUFFINGTON, Syracuse University, USA

FQ-1:IL12 **Growing Integration Layer [GIL] Strategy for Bio-active Ceramic Coating on Metallic Alloys**
MASAHIRO YOSHIMURA[1, 2], CHI-HUANG HUANG[1], [1]Hi-GEM & PCGMR, Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan; [2]Tokyo Institute of Technology, Tokyo, Japan

FQ-1:IL13 **Functionalization of Titanium Implants by Surface Modification**
MASANORI KIKUCHI, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

FQ-1:L14 **Spark Plasma Sintering, Crystallization, Mechanical Properties and Biological Behavior of an Innovative SrO- and MgO-containing Bioactive Glass**
D. ANGIONI, R. ORRÙ, G. CAO, Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università degli Studi di Cagliari, Cagliari, Italy; S. GARRONI, A. IACOMINI, Dipartimento di Chimica e Farmacia, Università degli Studi di Sassari, Sassari, Italy; D. BELLUCCI, V. CANNILLO, Dipartimento di Ingegneria "Enzo Ferrari", Università di Modena e Reggio Emilia, Modena, Italy

FQ-1:L15 **Surface Modification and Antibacterial Properties of Novel Superelastic Ti-Zr-Nb Alloys**
A.S. KONOPATSKY, T.O. TEPLYAKOVA, K.Yu. VLASOVA, National University of Science and Technology "MISIS", Moscow, Russia; M.V. Lomonosov Moscow State University, School of Chemistry, Moscow, Russia

FQ-1:L16 **Diatomite-based Nanocarriers for the Sustained Release of Galunisertib in Colorectal Cancer Cells**
C. TRAMONTANO[1, 2], G. CHIANESE[1], L. DE STEFANO[1], I. REA[1], E. LONARDO[3], D. DELLE CAVE[3], [1]Institute of Applied Science and Intelligent Systems (ISASI), National Research Council of Naples, Naples, Italy; [2]Department of Pharmacy, University of Naples Federico II, Naples, Italy; [3]Institute of Genetics and Biophysics (IGB), National Research Council of Naples, Naples, Italy

Session FQ-2
Tissue Engineering and Regenerative Medicine

FQ-2:IL01 **Nanomaterials for Morphogen Delivery and Skeletal Tissue Engineering**
E. JABBARI, Biomaterials and Tissue Engineering Laboratory, Department of Chemical Engineering, University of South Carolina, Columbia SC, USA

FQ-2:IL02 **Bioceramics for Bone Regeneration and Beyond**
JIANG CHANG, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China

FQ-2:IL03 **Smart Natural Hydrogels for Biomedical Applications**
S. FARÈ, Politecnico di Milano, Chemistry, Materials and Chemical Engineering Dept., Milan, Italy & INSTM, Florence, Italy

FQ-2:IL04 **PCL-based Matrices for Guided Tissue Regeneration**
JIN HO LEE, Department of Advanced Materials, Hannam University, Daejeon, South Korea

FQ-2:IL05 **Developing Multifunctional Scaffolds for Regenerating Complex Human Body Tissues**
MIN WANG, Department of Mechanical Engineering, The University of Hong Kong, Hong Kong, China

FQ-2:IL06 **Multi-functional Scaffolds of Gold Nanoparticles and Gelatin for Photothermal Therapy and Tissue Engineering**
GUOPING CHEN, X. WANG, N. KAWAZOE, Research Center for Functional Materials, National Institute for Materials Science, Tsukuba, Japan

FQ-2:IL07 **Inflammation Modulating Polymers for Tissue Tepair and Regeneration**
CHANGYOU GAO, Department of Polymer Science and Engineering, Zhejiang University, Hangzhou, China

Session FQ-3
New therapeutics and intelligent drug/biomolecule/ gene delivery systems

FQ-3:IL01 **Smart Stimuli-sensitive Combination Nanopreparations: Next Generation of Drug Delivery Systems**
V.P. TORCHILIN, Center for Pharmaceutical Biotechnology and Nanomedicine, Northeastern University, Boston, MA, USA

FQ-3:IL02 **Dendritic Nanoparticles as a Versatile Platform for Cancer Immunotherapy**
SEUNGPYO HONG, University of Wisconsin-Madison, Madison, WI, USA

FQ-3:IL03 **Novel Supramolecular Self-assembled Nano-carrier Systems for Drug and Gene Delivery**
JUN LI, Department of Biomedical Engineering, National University of Singapore, Singapore

FQ-3:IL04 **Intelligent Release of Functional Molecules Encapsulated in Complex Electrospun Polymer Fibers for Chem/Bio/Medical Applications**
A.J. STECKL, D. HAN, S. TORT, University of Cincinnati, Cincinnati, OH, USA

FQ-3:L05 **Biodegradable Particulate System for Efficient Non-invasive Transdermal Drug Delivery**
Y.I. SVENSKAYA, E.V. LENGERT, M.V. SAVELEVA, R.A. VERKHOVSKII, S.N. SHTYKOV, V.V. TUCHIN, Saratov State University, Saratov, Russia; E.E. TALNIKOVA, Saratov State Medical University, Saratov, Russia; D.A. GORIN, Skolkovo Institute of Science and Technology, Moscow, Russia; G.B. SUKHORUKOV, Queen Mary University of London, London, UK

FQ-3:L06 **Cell Membrane-covered Theragnostic Nanomaterials for Cancer Therapy**
V. MARANGONI, J. CANCINO, F. SANTOS, **V. ZUCOLOTTO**, Nanomedicine and Nanotoxicology Group, University of Sao Paulo, São Carlos, SP, Brazil

FQ-3:L07 **Agriculture Residue based Bioactive Glass for Targeted Drug Delivery and Bone Implantation**
D. KAUR, O.P. PANDEY, Functional Materials Lab, School of Physics and Materials Science; M.S. REDDY, Department of Biotechnology, Thapar Institute of Engineering & Technology, Patiala, India

Session FQ-4
Bio-imaging and theranostics

FQ-4:IL01 **Multifunctional Bioceramics and Glasses for Advanced Therapy and Theranostics**
F. BAINO, Institute of Materials Physics and Engineering, Applied Science and Technology Department, Politecnico di Torino, Torino, Italy

FQ-4:L02 **Theranostic Copper Oxide Nanoparticles Loaded Polymeric Nanocarriers as a Promising Drug Delivery System**
I.S. WEITZ, Department of Biotechnology Engineering, ORT Braude College, Karmiel, Israel

Session FQ-5
Clinical translations

FQ-5:IL01 **Clinical Translation in Regenerative Engineering**
C.T. LAURENCIN, Connecticut Convergence Institute for Translation in Regenerative Engineering, University of Connecticut, Health Center Farmington, CT, USA

FQ-4:IL02 **What Have we Learned from Bone? Bio-inspired Biomaterials and Approaches for Translational Musculoskeletal Tissue Engineering**
YUNZHI P. YANG, Departments of Orthopedic Surgery, (by courtesy) Materials Science and Engineering, and Bioengineering, Stanford University, Stanford, CA, USA

Focused Session FQ-6
Next Generation Implantable Neural Interfaces

FQ-6:IL01 **Electronic Materials and Devices for Neural Interfaces**
M.R. ABIDIAN, Biomedical Engineering, University of Houston, Houston, TX, USA

FQ-6:IL02 **Glial Interfaces: Materials, Devices and Approaches to Probe and Sense the "Other Brain".**
E. SARACINO[1], D. POLESE[2], D. SPENNATO[1], R. FABBRI[1], A.I. BORRACHERO-CONEJO[3,4], V. GUARINO[5], G.P. NICCHIA[6], M. MUCCINI[3], G. FORTUNATO[2], L. AMBROSIO[5], R. ZAMBONI[1], A. CONVERTINO[2], L. MAIOLO[2], **V. BENFENATI**[1], [1]CNR-ISOF, Istituto per la sintesi organica e la fotoreattività, Bologna, Italy; [2]CNR-IMM, Istituto per la Microelettronica e Microsistemi; [3]CNR-ISMN, Istituto per lo Studio dei Materiali Nanostrutturati, Bologna, Italy; [4]Vanderbilt University Dept. Biomedical Engineering, Nashville, TN, USA; [5]CNR-IPCB, Istituto per i Polimeri Compositi e Biomateriali, Napoli, Italy; [6]Università di Bari, Dept of Biotechnology Biosciences and Biopharmaceutics, Bari, Italy

FQ-6:IL03 **Interfacing Living Matter with Nanowires**
A. CONVERTINO, Istituto per la Microelettronica e i Microsistemi, CNR, Roma, Italy

FQ-6:IL04 **Magnetoelectric Nanomaterials for Wireless Neuronal Modulation**
K. KOZIELSKI, Technical University of Munich, Munich, Germany

FQ-6:IL05 **The Role of Ultra-flexible Electronics in Developing Advanced Brain Computer Interfaces**
L. MAIOLO, A. CONVERTINO, F. MAITA, D. POLESE, G. FORTUNATO, Istituto per la Microelettronica e Microsistemi - Consiglio Nazionale delle Ricerche (IMM-CNR), Roma, Italy

FQ-6:IL06 **Axon-like Neural Interface**
D.M. DURAND, Department of Biomedical Engineering, Case Western Reserve University, Cleveland, OH, USA

FQ-6:IL07 **Organic Nanotechnology for Optical Modulation of Living Systems, from Genesis to Specific Functions**
M.R. ANTOGNAZZA, Center for Nano Science and Technology, Italian Institute of Technology, Milano, Italy

Focused Session FQ-7
Wireless Body Sensor Networks for Healthcare Applications

FQ-7:IL01 **New Carbon Based Implantable Devices for Biomedical Applications**
G. BLUGAN, P. VALLACHIRA WARRIAM SASIKUMAR, Laboratory of High Performance Ceramics, Empa, Swiss Federal Laboratories for Material Science and Technology, Duebendorf, Switzerland

FQ-7:IL02 **A Wearable Sensing Platform for the Unobtrusive Analysis of Sweat**
F. DI FRANCESCO[1], F.M. VIVALDI[1], A. DALLINGER[2], D. SANTALUCIA[1], A. BONINI[1], N. POMA[1], D. BIAGINI[1], F. GRECO[2, 3], [1]Department of Chemistry and Industrial Chemistry, University of Pisa, Pisa, Italy; [2]Institute of Solid State Physics, Graz University of Technology, Graz, Austria; [3]Institute of Biorobotics, Sant'Anna School of Advanced Studies, Pisa, Italy

FQ-7:IL03 **Transparent Flexible Graphene Materials Integration in Textiles for Wearable Sensors and Light-emitting Devices**
M. CRACIUN, Centre for Graphene Science, Nano Engineering Science and Technology Group, College of Engineering, Mathematics and Physical Sciences, University of Exeter, UK

FQ-7:IL04 **Textile-based Deformation and Flexion Sensors for Motion Analysis and Human Machine Interaction**
A. TOGNETTI, Dipartimento di Ingegneria dell'Informazione, University of Pisa, Pisa, Italy

FQ-7:IL05 **Embedded Sensing by 3D Multi-material Printing**
G. KRIJNEN, A. DIJKSHOORN, M. SCHOUTEN, D. KOSMAS, G. WOLTERINK, Robotics and Mechatronics Dept., University of Twente, Enschede, The Netherlands

FQ-7:IL06 **Implantable Wireless Optofluidic Neural Devices and Scalable Wireless Technology for High-throughput Behavioral and Circuit Neuroscience**
JAE-WOONG JEONG, School of Electrical Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

FQ-7:IL07 **Non-invasive Daily Diagnostics through Printed Sensor Technology**
M.P.M. JANK, Fraunhofer Institute for Integrated Systems and Device Technology, Thin-Film Systems Group, Erlangen, Germany

FQ-7:IL08 **InnoRetVision - A new Research Training Group on Innovative Retinal Interfaces for Optimized Artificial Vision funded by the German Research Foundation**
W. MOKWA[1], P. WALTER[2], S. INGEBRANDT[1], RWTH Aachen University [1]Institute of Materials in Electrical Engineering I, Aachen, Germany; [2]Department of Ophthalmology, University Hospital, Aachen, Germany

FQ-7:IL09 **Printed Wearable Metasurfaces for Wireless On-body Sensors**
S. GENOVESI, F. COSTA, A. TOGNETTI, Dipartimento di Ingegneria dell'Informazione, University of Pisa, Pisa, Italy

Focused Session FA-5 / FQ-8
3D Bioprinting of Soft Tissues and Organs
(Focused Joint Session with Conference FQ)

FA-5/FQ-8:IL01 **Two Photon Polymerization for Biofabrication**
R. NARAYAN, North Carolina State University, Raleigh, NC, USA

FA-5/FQ-8:IL02 **Biofabrication: From Additive Manufacturing to Bioprinting and Bioassembly for Regenerative Medicine Applications**
L. MORONI, Maastricht University, MERLN Institute for Technology-Inspired Regenerative Medicine, Complex Tissue Regeneration Department, Maastricht, The Netherlands

FA-5/FQ-8:IL03 **Putting 3D Bioprinting to the Use of Tissue Model Fabrication**
Y. SHRIKE ZHANG, Division of Engineering in Medicine, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Cambridge, MA, USA

FA-5/FQ-8:IL04 **Multimaterial and Multiscale Biofabrication Approach**
C. DE MARIA, Research Center E. Piaggio and Dept. of Information Engineering at University of Pisa, Pisa, Italy

FA-5/FQ-8:IL05 **Scaffold-free Bio-3D Printing for Solid Organ Fabrication**
KOICHI NAKAYAMA, Department of Regenerative Medicine and Biomedical Engineering, Faculty of Medicine, Saga University, Saga, Japan

FA-5/FQ-8:IL06 **Biofabricating Murine and Human Myo-substitutes for Rapid Volumetric Muscle Loss Restoration**
M. COSTANTINI, Institute of Physical Chemistry - PAS, Warsaw, Poland; C. GARGIOLI, Università degli studi di Roma - Tor Vergata, Rome, Italy

FA-5/FQ-8:IL07 **Nano-encapsulation of Stem Cell-derived β-cell Aggregates using 3D Bioprinting System**
YEONGGWON JO, D.G. HWANG, M. KIM, S. CHO, J. JANG, Pohang University of Science and Technology (POSTECH), Pohang, Gyeongbuk, South Korea

FA-5/FQ-8:IL08 **Modular Assembly of 3D Bioprinted Engineered Heart Tissue to Reconstruct Contractile Direction to Mimic Myocardial Fiber Orientation**
DONG GYU HWANG, U. YONG, H. CHOI, J. JANG, POSTECH, Pohang, Gyeongbuk, South Korea

FA-5/FQ-8:IL09 **Strategies for Bioprinting of Volumetric Tissue Constructs**
M. GELINSKY, Centre for Translational Bone, Joint and Soft Tissue Research, TU Dresden, Dresden, Germany

FA-5/FQ-8:IL10 **Organ-on-chip Technology for the Study of Neuro-degenerative Disorders**
A. POLINI, CNR Nanotec, Lecce, Italy

FA-5/FQ-8:IL11 **3D in Vitro Model of the Microbiota-gut-bone Axys**
G. VOZZI, F. BIAGINI, F. MONTEMURRO, C. DE MARIA, Research Center "E. Piaggio" and Department of Information Engineering, University of Pisa, Pisa, Italy; M. CALVIGIONI, E. GHELARDI, Research and New Technologies in Medicine and Surgery, University of Pisa, Pisa, Italy; G. CERQUENI, S. MARCHI, M. MATTIOLI-BELMONTE, DISCLIMO, Università Politecnica delle Marche, Ancona Italy.

FA-5/FQ-8:L12 **A Biohybrid 3D-printed Tissue-sensor Platform for Continuous Monitoring of Cardiac Muscle Contractions**
UIJUNG YONG[1], D. KIM[1], H. KIM[2], D. G. HWANG[1], S. CHO[1], H. NAM[1], S. KIM[1], T. Y. KIM[1], U. JEONG[1], K. KIM[1], W. K. CHUNG[1], W.H. YEO[2], J. JANG[1], [1]POSTECH, Pohang, Gyeongsangbuk-do, South Korea; [2]Georgia Institute of Technology, Atlanta, GA, USA

FA-5/FQ-8:L13 **3D Bioprinting of Human Islet-like Cellular Aggregates-Vascular Platform for Modeling Diabetes**
MYUNGJI KIM, S. CHO, D.G. HWANG, J. JANG, POSTECH, Pohang, Gyeongbuk, South Korea

FA-5/FQ-8:IL14 **Engineering the Cellular Niche Via CAD/CAM Laser Processing**
J. SAKSENA[1], S.C. SKLARE[1], B.T. VINSON[1], Y. HUANG[2], **D.B. CHRISEY**[1], [1]Tulane University, New Orleans, LA, USA; [2]University of Florida, Gainesville, FL, USA

FA-5/FQ-8:IL15 **Implantable Bioprinted Devices for Vascularisation Studies**
B. DERBY, Department of Materials, University of Manchester, Manchester, UK

FA-5/FQ-8:IL16 **3D Bioprinted Models in Human Organogenesis and Disease**
M. DOMINGOS, Department of Mechanical, Aerospace and Civil Engineering, School of Engineering, Faculty of Science and Engineering & The Henry Royce Institute,The University of Manchester, Manchester, UK

FA-5/FQ-8:IL17 **Toward in vitro Tissue Modeling using Bioprinting Technology**
JINAH JANG, POSTECH, Pohang, Gyeongbuk, South Korea

FR - 4th International Conference
MATERIALS CHALLENGES FOR SUSTAINABLE NUCLEAR FISSION AND FUSION TECHNOLOGIES

FR:KL **Decarbonization of the Energy Sector: Contribution of Nuclear Power Today and in Perspective**
S. MONTI, International Atomic Energy Agency, Vienna International Center, Vienna, Austria

Session FR-1
Structural components for nuclear fission and fusion applications

FR-1:IL01 **SiC-SiC CMC for Fusion Energy Technology**
YUTAI KATOH, T. KOYANAGI, B. PINT, Oak Ridge National Laboratory, Oak Ridge, TN, USA

FR-1:IL02 **Discrete and Continuum Models for Body Forces for Virtual Tokamak Reactor Simulations**
S.L. DUDAREV, M. BOLEININGER, M.R. GILBERT, P.-W. MA, D.R. MASON, L. REALI, UKAEA, Culham Science Centre, Oxfordshire, UK

FR-1:IL03 **Rapid, Combinatorial Down-selection of Materials for Fusion Power**
M. SHORT[1], B. DACUS[1], K. WOLLER[1], G. WALLACE[1], E. BOTICA ARTALEJO[1], K. HATTAR[2], C. DENNETT [3], W. ZHOU[1], A. PETERKIN[1], W. CAIRANG[1], Y. YANG[4], A. MINOR[5], G. ZHENG[1], [1]Massachusetts Institute of Technology, Cambridge, MA, USA; [2]Sandia National Lab., USA; [3] Idaho National Lab., USA; [4]Penn State University, USA; [5]University of California at Berkeley, USA

FR-1:L04 **Microstructural Characterization of Co-base ODS Alloy Prepared by Additive Manufacturing**
JINSUNG JANG[1], JUWON SUH[1, 2], HEUNG NAM HAN[2], SUK HOON KANG[1], [1]Korea Atomic Energy Research Institute, Daejeon, South Korea; [2]Seoul National University, South Korea

FR-1:L05 **Oxidation of P91 Steel in Molten Lead**
M.E. ANGIOLINI, P. AGOSTINI, F. FABBRI, M. FALCONIERI, Department for Fusion and Technologies for Nuclear Safety and Security, ENEA, Rome, Italy; F. MURA, Centro di Ricerca per le Nanotecnologie Applicate all'Ingegneria, Università di Roma "La Sapienza", Rome, Italy

FR-1:L06 **Rapid Alloy Prototyping of Castable Steels with Dispersed Nano-precipitates for Nuclear Applications**
S. MEHRABAN, S. JONES, M. YAR, J. CULLEN, N. LAVERY, Swansea University Bay Campus, College of Engineering, Skewen, Swansea, UK; H. DAWSON, UKAEA Materials Division, United Kingdom Atomic Energy Authority, Culham Science Centre, Abingdon, UK

Session FR-2
Low activation structural materials for nuclear fusion systems

FR-2:IL01 **EUROFER97 as Structural Material for the ITER Test Blanket Module and the DEMO Starter Blanket**
G. AIELLO[1], E. GAGANIDZE[2], P. LAMAGNÈRE[3], G. PINTSUK[4], M. RIETH[2], D. TERENTYEV[5], M. ZMITKO[6], [1]EUROfusion - Programme Management Unit, Fusion Technology Department, Garching, Germany; [2]Karlsruhe Institute of Technology, Institute for Applied Materials, Eggenstein-Leopoldshafen, Germany; [3]CEA, DES, IRESNE, Nuclear Technology Department, Cadarache, Saint Paul-Lez-Durance, France; [4]Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung - Plasmaphysik, Jülich, Germany; [5]SCK CEN, Nuclear Materials Science Institute, Mol, Belgium; [6]Fusion for Energy (F4E), Barcelona, Spain

FR-2:IL02 **Radiological Response of Fusion Materials: Impact of Impurities Radwaste**
M.R. GILBERT, G.W. BAILEY, UKAEA, Culham Science Centre, Abingdon, UK

FR-2:IL03 **Development of Fabrication Technology for Low Activation Vanadium Alloys as Fusion Blanket Structural Materials**
TAKUYA NAGASAKA[1, 2], T. TANAKA[1], J. SHEN[1, 2], S. JIANG[3], K.-I. FUKUMOTO[4], T. TOYAMA[5], K. YABUUCHI[6], [1]National Institute for Fusion

Science, Toki, Japan; [2]SOKENDAI (The Graduate University for Advanced Studies), Toki, Japan; [3]Qilu University of Technology (Shandong Academy of Sciences), Jinan, China; [4]Research Institute of Nuclear Engineering, University of Fukui, Tsuruga, Japan; 5Institute for Materials Research, Tohoku University, Sendai, Japan; [6]Institute of Advanced Energy, Kyoto University, Uji, Japan

FR-2:L04 **Development of RAFM steels for DEMO Water Cooled blanket**
O. TASSA, L. BOZZETTO, E. ZANIN, RINA Consulting - CSM, Rome Italy; M. ANGIOLINI, L. PILLONI, C. CRISTALLI, L. BOZZETTO, E. ZANIN, N. BETTOCCHI, P. AGOSTINI, ENEA, Brasimone, Camugnano (BO), Italy

Session FR-3
Materials for first wall components of nuclear fusion systems

FR-3:IL01 **Development of Tungsten Fibre-reinforced Copper Alloy Composites for Application as Heat Sink Materials in DEMO High Heat Flux Components**
A. v. MÜLLER, B. BÖSWIRTH, H. GREUNER, K. HUNGER, P. JUNGHANNS, R. NEU, J. RIESCH, J.H. YOU, Max-Planck-Institut für Plasmaphysik, Garching, Germany; V. CERRI, A. MORIANI, S. ROCCELLA, E. VISCA, ENEA, Frascati RM, Italy; U. SIEFKEN, Louis Renner GmbH, Bergkirchen, Germany

FR-3:IL02 **Hydrogen Isotope Permeation in Fusion Reactor Materials**
K. HEINOLA, C. HILL, International Atomic Energy Agency, Vienna International Centre, Vienna, Austria

FR-3:IL03 **Development of ODS-Cu as Divertor Heat Sink Materials**
RYUTA KASADA, Institute for Materials Research, Tohoku University, Sendai, Japan

FR-3:IL04 **Controlling Interfaces for Enhanced Thermal and Radiation Stability in Tungsten PFMs**
J.R. TRELEWICZ, Stony Brook University, Stony Brook, NY, USA

FR-3:IL05 **Additive Manufacturing of Tailored Plasma-facing Fusion Wall Components**
D. DOROW-GERSPACH[1], A. KIRCHNER[2], M. GIPPERICH[3], TH. LOEWENHOFF[1], T. WEISSGÄRBER[2], M. WIRTZ[1], G. PINTSUK[1], CH. LINSMEIER[1], [1]Forschungszentrum Jülich, Institut für Energie- und Klimaforschung, Jülich, Germany; [2]Fraunhofer-Institut für Fertigungstechnik und Angewandte Materialforschung IFAM, Dresden, Germany; [3]Fraunhofer-Institut für Produktionstechnologie IPT, Aachen, Germany

FR-3:IL06 **Design and Challenges of Tritium Breeding Blanket Systems Tested in ITER**
H. TANIGAWA, W. GUAN, Y. MIYOSHI, T. KATAGIRI, T. HIROSE, Y. KAWAMURA, Rokkasho Fusion Institute, National Institutes for Quantum Science and Technology, Ibaraki, Japan

Session FR-4
Functional materials

FR-4:IL01 **Diagnostic First Mirrors: Plasma Impact on Diagnostic Materials and Components**
M. RUBEL[1], P. PETERSSON[1], SUNWOO MOON[1], J. GRZONKA[2], A. WIDDOWSON[3], and JET Contributors*, [1]KTH Royal Institute of Technology, Fusion Plasma Physics, Stockholm, Sweden; [2]Universidad de Cadiz, Cadiz, Spain; [3]Culham Science Centre, Abingdon, Oxfordshire, UK
*See list of authors: J. Mailloux, Nucl. Fusion 2021

FR-4:IL02 **Functional Materials - Polymer Type Materials for ITER Components**
V. BARABASH, G. KIM, M. LOUGHLIN, E. POLUNOVSKIY, ITER Organization, St. Paul Lez Durance Cedex, France

FR-4:IL03 **Characterization of Advanced Dielectric and Optical Materials for Application in DEMO**
R. VILA, D. CRUZ, E. LEÓN, Laboratorio Nacional de Fusión, CIEMAT, Madrid, Spain

FR-4:IL04 **Development of Next Generation Copper Alloys for High Heat Flux Application**
L.L. SNEAD[1], D.J. SPROUSTER[1], J.R. TRELEWICZ[1], S.J. ZINKLE[2], BIN CHENG[2], Y. YANG[3], [1]Stony Brook University, Stony Brook, NY, USA; [2]University of Tennessee, Knoxville. Knoxville TN, USA; [3]Oak Ridge National Laboratory, Oak Ridge, TN, USA

Session FR-5
Nuclear fuel materials

FR-5:IL01 **Characterization of Innovative Advance Reactor Metallic Fuel Concepts**
L. CAPRIOTTI[1], D.L. PORTER[1], J.H. HARP[2], D.M. WACHS[1], [1]Idaho National Laboratory, Idaho Falls, ID, USA; [2]Oak Ridge National Laboratory, Oak Ridge, TN, USA

FR-5:L02 **Mixed Actinides Oxides Synthesis by Solution Combustion Synthesis**
A. HAUTECOUVERTURE, C. REY, P. ESTEVENON, X. DESCHANELS, ICSM UMR 5257, CEA Marcoule, Bagnols sur Cèze, France

FR-5:L03 **Dislocation Nucleation in UO2 Spent Fuels evaluated by Synchrotron-based Laue Diffraction Method**
S. BHATTACHARYA, G. KURI, J. BERTSCH, Nuclear Energy and Safety Department, Paul Scherrer Institut, PSI-Villigen, Switzerland

FR-5:L04 **Microstructural Effect of p(O2) Variation in Mixed Oxides (MOX) Sintering**
G.C.C. MIRANDA, CEA/DES/ISEC/DMRC, Marcoule, France and Université Grenoble Alpes, Saint-Martin d'Hères, France; G. BERNARD-GRANGER, L. RAMOND, F. LEBRETON, CEA/DES/ISEC/DMRC, Université de Montpellier, Marcoule, France; A. NDIAYE, T. GERVAIS, Orano Melox, Chusclan, France

Session FR-6
Radiation effects

FR-6:IL01 **Frontiers of Transmutation Materials Science Characterization**
D.J. SPROUSTER, J.R. TRELEWICZ, T. KOYANAGI, Y. KATOH, L.L SNEAD, Stony Brook University, Stony Brook. NY, USA

FR-6:IL02 **Low Temperature Embrittlement and Fracture of Structural Materials "Before-During-After" Nuclear Reactor Irradiation**
V. CHERNOV, A.A. Bochvar Institute, Moscow, Russia

FR-6:L03 **Interstitial Loop Evolution in Alpha-Fe under Irradiation: Effects of C15 Cluster Stability and Loop One-dimensional Movement**
JIE GAO, E. GAGANIDZE, J. AKTAA, Karlsruhe Institute of Technology (KIT), Institute for Applied Materials, Eggenstein-Leopoldshafen, Germany

FR-6:L04 **Dislocation Sink Efficiencies for Di-interstitials in BCC (Fe, V) and FCC (Cu) Metals**
D.N. DEMIDOV, A.B. SIVAK, P.A. SIVAK, National Research Center "Kurchatov Institute", Moscow, Russia

FR-6:L05 **Effect of Simulation Technique on the High-dose Damage Evolution in Nuclear Materials**
F. GRANBERG, J. BYGGMÄSTAR, K. NORDLUND, Department of Physics, University of Helsinki, FINLAND; D.R. MASON, UK Atomic Energy Authority, Culham Science Centre, Oxfordshire, UK

FR-6:L06 **Numerical and Experimental Study of Stress Impact on Point Defect Absorption by Dislocations**
D. DA FONSECA, T. JOURDAN, Université Paris-Saclay, CEA, Service de Recherches de Métallurgie Physique, Gif-sur-Yvette, France; F. ONIMUS, Université Paris-Saclay, CEA, Service de Recherches Métallurgiques Appliquées, Gif-sur-Yvette, France; F. MOMPIOU, CEMES, CNRS et Université de Toulouse, Toulouse, France

FR-6:IL07 **Helium Induced Degradation Scenarios for Fusion Structural Steels**
A. BHATTACHARYA, Materials Science and Technology Division, Oak Ridge National Lab, Oak Ridge, TN, USA

FR-6:IL08 **Development of Small Specimen Test Technique for Master Curve Fracture Toughness Measurements of Eurofer97 and F82H**
XIANG CHEN, M.A. SOKOLOV, Y. KATOH, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA; S. GONZALEZ DE VICENTE, International Atomic Energy Agency, Vienna, Austria

FR-6:IL09 **Material Selection of Accident Tolerant Fuel Cladding**
B.A. PINT, K.A. KANE, S.B. BELL, Materials Science and Technology Division, C.P. MASSEY, Nuclear Energy and Fuel Cycle Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA

FR-6:L10 **Phase Separation under Irradiation in Fe-Ni and Low-alloyed Steels**
Q. TENCE[1], E. MESLIN[1], M. NASTAR[1], I. MOUTON[2], B. DÉCAMPS[3], I. JOLIOT-CURIE[4], [1]Université Paris-Saclay, CEA, Service de Recherches de Métallurgie Physique, Gif-sur-Yvette, France; [2]Université Paris-Saclay, CEA, Service de Recherches de Métallurgie Appliquée, Gif-sur-Yvette, France; [3]Laboratoire de Physique des 2 infinis; [4](IJCLab), Université Paris-Saclay, Orsay, France

FR-6:L11 **MD-based Approach for Calculation of Radiation Defect Dipole Tensor and Its Application to Di-interstitials in BCC (Fe, V) and FCC (Cu) Crystals**
A.B. SIVAK, D.N. DEMIDOV, P.A. SIVAK, National Research Center "Kurchatov Institute", Moscow, Russia

FR-6:L12 **Ni Effect of Radiation-induced Segregation in FeMnNiCr HEA Alloys**
J. GAO[1], **E. MESLIN**[1], B. DÉCAMPS[2], A. FRACZKEWICZ[3], [1]CEA, Saclay, Gif-sur-Yvette, France; [2]IJC lab, Orsay University, France; [3]ESME, St Etienne, France

FR-6:IL13 **Critical Evaluation of High Temperature Helium Embrittlement Phenomena in Structural Materials**
S.J. ZINKLE[1, 2], ZEHUI QI[1], [1]University of Tennessee, Knoxville, TN, USA; [2]Oak Ridge National Laboratory, Oak Ridge, TN, USA

FR-6:IL14 **In-situ TEM of the Dynamics of Radiation-produced Defects**
KAZUTO ARAKAWA, NEXTA, Shimane University, Matsue, Japan

Session FR-7
Materials modelling and database

FR-7:IL01 **Modeling Grain Boundary Mediated Plasticity with Massively Parallel Atomistic Simulations**
T. FROLOV, Lawrence Livermore National Laboratory, Berkeley, CA, USA

FR-7:IL02 **Modeling of Hardening in Spinodally-decomposed Fe-Cr Alloys**
TOMOAKI SUZUDO, H. TAKAMIZAWA, Y. NISHIYAMA, Japan Atomic Energy Agency, Tokai-mura, Ibaraki, Japan; A. CARO, George Washington University, Ashburn, VA, USA; T. TOYAMA, Y. NAGAI, Tohoku University, Oarai, Ibaraki, Japan

FR-7:IL03 **Modeling Time-dependent Deformation Processes in Fe and W under Fusion First Wall Conditions**
QIANRAN YU, SHU HUANG, C. MCELFRESH, S. CHATERJEE, N. BERTIN, M. GILBERT, S. AUBRY, G. PO, S. DUDAREV, **J. MARIAN**, University of California Los Angeles, Los Angeles, CA, USA

FR-7:L04 **Atomistic Modeling of Primary Damage in Refractory W-Ta Solid Solution**
S. SEGANTIN, R. TESTONI, M. ZUCCHETTI, Dipartimento Energia, Politecnico di Torino, Torino, Italy

FR-7:L05 **Atomic Simulation of Structure in the Vicinity of Nanovoids and Evaluation of the Shifting Rates of the Void Surface Elements in Cubic Metals**
A.V. NAZAROV[1, 2], A.P. MELNIKOV[1], A.A. MIKHEEV[3], [1]National Research Nuclear University MEPhI, (Moscow Engineering Physics Institute), Moscow, Russia; [2]Institute for Theoretical and Experimental Physics named by A.I. Alikhanov of NRC «Kurchatov Institute», Moscow, Russia; [3]The Kosygin State University of Russia

FR-7:L06 **Atomistic Simulation of Point Defects Diffusion in Refractory Alloys**
S. STARIKOV, D. SMIRNOVA, M. MROVEC, R. DRAUTZ, Ruhr University Bochum, ICAMS, Bochum, Germany

Session FR-8
Crosscutting materials issues, present status, challenges and directions for nuclear fission and fusion science and technology

FR-8:IL01 **Challenges for Nuclear Fusion Science and Technology**
M. ABDOU, Mechanical and Aerospace Engineering Dept, University of California-Los Angeles, Los Angeles, CA, USA

FR-8:IL02 **Challenges for Fusion Materials and Potential Solutions**
J.W. COENEN[1, 2], Y. MAO[1], A. LITNOVSKY[1, 3], A. HOUBEN[1], V. GANESH[1], A. TERRA[1], D. DOROW-GERSPACH[1], J. RIESCH[4], R. NEU[4, 5], Ch. LINSMEIER[1], [1]Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung - Plasmaphysik, Partner of the Trilateral Euregio Cluster (TEC), Jülich, Germany; [2]Department of Engineering Physics, University of Wisconsin-Madison, Madison, WI, USA; [3]National Research Nuclear University MEPhI, Moscow, Russian Federation; [4]Max-Planck-Institut für Plasmaphysik, Garching, Germany; [5]Technische Universität München, Garching, Germany

FR-8:IL03 **Ion Irradiation as a Surrogate for Fission/Fusion Reactor Irradiation**
G.S. WAS[1], L. CLOWERS[1], Z. JIAO[1], S. TALLER[2], B. WIRTH[3], [1]University of Michigan, Ann Arbor, MI, USA; [2]Oak Ridge National Laboratory, USA; [3]University of Tennessee, USA

FR-8:IL04 **Powder Metallurgy Alloys for Fusion and Fission Science and Technology**
J.P. WHARRY[1], C.D. CLEMENT[1], S.S. PANUGANTI[1], Y. ZHAO[1], D.P. GUILLEN[2], D.W. GANDY[3], [1]School of Materials Engineering, Purdue University, West Lafayette, IN, USA; [2]Idaho National Laboratory, Idaho Falls, ID, USA; [3]Electric Power Research Institute, Charlotte, NC, USA

Focused Session FR-10
Materials Issues in Radioactive Nuclear Waste Treatment and Disposal

Session FR-10.1
Waste form development, including glass, ceramic, cement and metallic waste forms

FR-10.1:IL01 **Geopolymer Foam as Inorganic Monolithic Sorbent for the Decontamination of Liquid Radioactive Waste**
S. PETLITCKAIA, CEA, DES, ISEC, DE2D, SEAD, LCBC, Univ Montpellier, Marcoule, Bagnols sur Cèze, France; Y. BARRÉ, CEA, DES, ISEC, DMRC, STDC, LPSD, Univ Montpellier, Marcoule, Bagnols sur Cèze, France; J. VICENTE, Aix Marseille Univ, IUSTI, CNRS, UMR 7343, Marseille, France; **A. POULESQUEN**, CEA, DES, ISEC, DE2D, SEAD, LCBC, Univ Montpellier, Marcoule, Bagnols sur Cèze, France

FR-10.1:IL02 **Development of Zirconolite Ceramic Wasteforms for Pu Immobilisation**
L.R. BLACKBURN[1], L.J. GARDNER[1], A.R. MASON[1], SHI-KUAN SUN[2], E.R. MADDRELL[3], M.C. STENNETT[1], C.L. CORKHILL[1], N.C. HYATT[1], [1]University of Sheffield, UK; [2]Guangdong University of Technology, China; [3]National Nuclear Laboratory, UK

FR-10.1:IL03 **High-entropy A2B2O7-type Oxide Ceramics for the Immobilization of High-level Radioactive Waste**
GUO-JUN ZHANG, L. ZHOU, F. LI, J.-X. LIU, State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, College of Science, Institute of Functional Materials, Donghua University, Shanghai, China

FR-10.1:IL04 **Thermodynamic Stability, Radiation Damage and Leaching Effects in Tunnel Structured Hollandite Materials**
K. BRINKMAN, Materials Science and Engineering, Clemson University, Clemson, SC, USA

FR-10.1:IL05 **Recent Advances in the Immobilization of Low- or Intermediate-level Radioactive Waste in Cementitious Materials: Potential of Magnesium Potassium Phosphate Cements**
C. CAU DIT COUMES[1], G. PORAS[1], D. CHARTIER[1], D. LAMBERTIN[1], C. CANNES[2], S. DELPECH[2], S. PERRIN[1], [1]CEA, DES, ISEC, DE2D, SEAD, Univ Montpellier, Marcoule, France; [2]Institut de Physique Nucléaire, CNRS, Univ. Paris-Sud, Orsay, France

FR-10.1:IL06 **Actinides Separation over Lanthanides via Aluminium Cathode based Electrolysis in LiCl-KCl Eutectic**
WEIQUN SHI, Y. LIU, Y. ZHONG, D. YANG, Laboratory of Nuclear Energy Chemistry, Institute of High Energy Physics, CAS, Beijing, China

FR-10.1:IL07 **Investigation of Phosphate-based Wasteforms for the Immobilisation of Pyroprocessing Wastes**
D.J. BAILEY[1], L.J. GARDNER[1], M.C. STENNETT[1], D. MCKENDRICK[2], M.T. HARRISON[2], N.C. HYATT[1], [1]Immobilisation Science Laboratory, Department of Materials Science and Engineering, University of Sheffield, Sheffield, UK; [2]National Nuclear Laboratory, Central Laboratory, Sellafield, Seascale, Cumbria, UK

FR-10.1:IL08 **Adsorptivity and Radiation Resistance of Crown Ether Resins for Separation of Radionuclides**
MASANOBU NOGAMI, M. OYA, Kindai University, Higashi-Osaka, Osaka, Japan; T. SUZUKI, Nagaoka University of Technology, Nagaoka, Niigata, Japan; N. SATO, Kyoto University, Kumatori, Osaka, Japan

FR-10.1:L09 **Incorporation of Tetravalent Actinides in Monazite Structures**
A. ROCHE, S. SZENKNECT, A. MESBAH, N. CLAVIER, R. PODOR, N. DACHEUX, ICSM, UnivMontpellier, CEA, CNRS, ENSCM, Site de Marcoule, Bagnols-sur-Cèze, France

FR-10.1:L10 **Chemical Durability of A2B2O7 Pyrochlore and Fluorite Structure Types and Machine-learning Prediction**
JIE LIAN, Department of Mechanical, Aerospace, Nuclear Engineering, Rensselaer Polytechnic Institute, Troy, NY, USA

FR-10.1:L11 **Understanding the Evolution of an Interface during the Dissolution of Nd-doped UO2 by Macro-/Microscopic Dual Approach**
T. BARRAL, L. CLAPAREDE, R. PODOR, N. DACHEUX, ICSM, UnivMontpellier, CEA, CNRS, ENSCM, Site de Marcoule, Bagnols-sur-Cèze, France

Session FR-10.2

Challenging waste constituents, such as actinides, noble metals, and volatile species

FR-10.2:IL01 **Challenges in the Management of Spent Nuclear Fuel**
G. LEINDERS, Belgian Nuclear Research Centre (SCK CEN), Fuel Materials, Institute for Nuclear Materials Science, Mol, Belgium

FR-10.2:IL02 **Development of Porous Silica-based Salt Adsorbents for Some Fission Products Removal from Liquid Waste**
YUEZHOU WEI, L. CHEN, University of South China, Hengyang, China; Y. WU, Shanghai Jiao Tong University, Shanghai, China

FR-10.2:IL03 **Removal of Polonium by SiO2 Nanofiber Filter for Lead Alloy-cooled Reactors**
XINPENG WANG, X. CHEN, X. CHEN, Guangxi University, Nanning, China

FR-10.2:IL04 **Glass-ceramic Waste Forms for Actinide Immobilization**
D.J. GREGG, Y. ZHANG, R. HOLMES, G. TRIANI, Australian Nuclear Science and Technology Organisation, Kirrawee DC, NSW, Australia

FR-10.2:L05 **Solid Fixation on Grafted Mesoporous Silica for Actinide Uptake**
C. REY, X. DESCHANELS, J. CAUSSE, ICSM, CEA, CNRS, Université de Montpellier, ENSCM, Bagnols-sur-Cèze, France; G. ZANTE, S. LE CAËR, Université Paris-Saclay, CEA, CNRS, NIMBE, UMR 3685, Gif-sur-Yvette, France; V. BOUNIOL, S. SENE, Y. GUARI, ICGM, Université de Montpellier, CNRS, ENSCM, Montpellier, France

FR-10.2:L06 **Fabrication and Characterization of Americium Transmutation Target Microspheres**
G. COLAK[1,2], G. LEINDERS1, A.R. DELVILLE[1], F. JUTIER[1], M. VERWERFT[1], J. VLEUGELS[2], [1]Belgian Nuclear Research Centre (SCK CEN), Institute for Nuclear Materials Science, Mol, Belgium; [2]KU Leuven, Department of Materials Engineering, Leuven, Belgium

Session FR-10.3

Waste form modeling, performance testing, and advanced characterization techniques

FR-10.3:IL01 **Characterization of Radiation Effects in Ceramics with Spallation Neutron Probes**
M. LANG, Department of Nuclear Engineering, University of Tennessee, Knoxville, TN, USA

FR-10.3:IL02 **Recent Experimental Evidence for the Suppression of the dissolution of spent nuclear fuel by H2 Gas**
Th. MENNECART[1], L. IGLESIAS PÉREZ[2], M. HERM[2], C. CACHOIR[1], K. LEMMENS[1], V. METZ[2], K. MEERT[3], [1]SCK CEN – Belgian Nuclear Research Centre, Mol, Belgium; [2]KIT-INE - Karlruhe Institute of Technology, Institute for Nuclear Waste Disposal, Eggenstein-Leopoldshafen, Germany; [3]ONDRAF/NIRAS - Belgian Agency for Radioactive Waste and Enriched Fissile Material, Bruxelles, Belgium

FR-10.3:IL03 **In-operando Raman Spectroscopy applied to the Understanding of MOX Fuel Alteration Mechanisms**
S. MIRO, C. JÉGOU, L. SARRASIN, M. TRIBET, V. BROUDIC, C. MARQUES, S. PEUGET, CEA, DES, ISEC, DE2D, Université de Montpellier, Marcoule, France

FR-10.3:IL04 **Machine Learning-accelerated Design for Advanced Nuclear Waste Form Development**
JIANWEI WANG, Louisiana State University, Baton Rouge, LA, USA

FR-10.3:IL05 **Radiation Damage and Corrosion of Single and Multi-phase Amorphous and Crystalline Solids**
ANAMUL HAQ MIR, MIAMI Irradiation Facility, School of Computing and Engineering, University of Huddersfield, UK

FR-10.3:IL06 **Long-term Matrix Corrosion of Spent Nuclear Fuels: Process Understanding derived from Single Effect Studies on Simplified Model Systems**
D. BOSBACH, Forschungszentrum Jülich, Jülich, Germany

Session FR-10.4

Materials issues in the design and operation of waste immobilization facilities

FR-10.4:IL01 **MAX Phases in Nuclear Material Applications**
CHENXU WANG, Peking University, Beijing, China

FR-10.4:IL02 **Production of Mixed Actinide Oxide Microparticle Reference Materials – Materials Science Aspects and Challenges**
S. NEUMEIER, P. KEGLER, S.K. POTTS, M. KLINKENBERG, D. BOSBACH, I. NIEMEYER, Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research - Nuclear Waste Management and Reactor Safety (IEK-6), Juelich, Germany; S. HAMMERICH, Heidelberg University, Institute of Earth Sciences, Heidelberg, Germany

FR-10.4:L03 **Synthesis of Silicotitanates for Sr Sorption – Influence of the Ti/Si Ratio**
T. TRATNJEK[1], J. CAUSSE[1], A. HERTZ[2], X. DESCHANELS[1], [1]Univ Montpellier, ICSM, CEA, CNRS, ENSCM, Marcoule, France; [2]CEA Marcoule, DES/ISEC/DE2D/SEAD/LPSD, Marcoule, France

FR-10.4:IL04 **Advanced Nuclear Waste Form Research at UCI**
S.C. FINKELDEI, University of California, Irvine, Department of Chemistry, Irvine, CA, USA

FR-10.4:IL05 **Nanoporosity and Irradiation - New Perspectives for the Treatment of Radioactive Effluents?**
J. LIN[1], G. TOQUER[1], C. GRYGIEL[2], S. DOURDAIN[1], Y. GUARI[3], C. REY[1], J. CAUSSE[1], **X. DESCHANELS**[1], [1]ICSM, CEA, CNRS, ENSCM, Univ Montpellier, Marcoule, France; [2]CIMAP, CEA-CNRS-ENSICAEN-UNICAEN, Caen, France; [3]ICGM, Univ Montpellier, CNRS, ENSCM, Montpellier, France

Poster Presentations

F:P01 **Additive Manufacturing Process of Microscale High-aspect Ratio Structures using Ceramic Resin for High Voltage and High Vacuum Applications**
K. KROL, W. NAWROT, D. NOWAK, K. LASZCZYK, Wroclaw University of Science and Technology, Faculty of Electronics, Photonics and Microsystems, Wroclaw, Poland

F:P02 **Production of Magnetically Soft Components from FeSi6.5 Alloy with Selective Laser Melting Technology - Optimisation, Prototyping and Post-processing**
B. JÓZWIK, A. KOLANO-BURIAN, P. ZACKIEWICZ, A. PILSNIAK, M. POLAK, A. BRUDNY, A. RADON, Łukasiewicz Research Network, Institute of Non-Ferrous Metals, Gliwice, Poland; A. WÓJCIK, Institute of Metallurgy and Materials Science, Polish Academy of Sciences, Krakow, Poland

F:P03 **Soft Magnetic Amorphous and Nanocrystalline Ribbons for Energy Conversion and Storage**
T. WARSKI[1,2], L. HAWELEK[1], A. RADON[1], A. PILSNIAK[1], A. KOLANO-BURIAN[1], M. POLAK[1], A. WOJCIK[3], [1]Lukasiewicz Research Network - Institute of Non-Ferrous Metals, Gliwice, Slaskie, Poland; [2]Silesian University of Technology, Gliwice, Slaskie, Poland; [3]Institute of Metallurgy and Materials Science of Polish Academy of Sciences, Krakow, Malopolskie, Poland

F:P04 **Morpho-structural Characterization of Polymer Embedded BaTiO2 and y-Fe2O3 Nano-structures**
L. MIHAI[1], **A. MARCU**[1], A. ROTARU[2], G. CARUNTU[2, 3], D. CARUNTU[2, 3], F. DUMITRACHE[1], A. CRIVEANU[1], L. GAVRILA-FLORESCU[1], M. ZAMFIRESCU[1], [1]National Institute for Laser Plasma and Radiation Physics, Magurele, Ilfov, Romania; [2]Department of Electrical Engineering and Computer Science & MANSiD Research Center, "Stefan Cel Mare" University, Suceava, Romania; [3]Department of Chemistry and Biochemistry, Central Michigan University, Mount Pleasant, MI, USA

F:P05 **Modelling a Combined Electrostatic – Triboelectric Flexible Generator**
S.E. HAIM, Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France; C. JEAN-MISTRAL, Univ. Lyon, INSA-Lyon, CNRS UMR 5259, LaMCoS, Villeurbanne, France; A. SYLVESTRE, Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France

F:P06 **News Advances on ZnO Nanorods Arrays for Flexible and Transparent Supercapacitors**
E. NAVARRETE-ASTORGA, J. RODRÍGUEZ-MORENO, M. CRUZ LÓPEZ-ESCALANTE, J.J. PEINADO-PÉREZ, F. MARTÍN, **J. RAMOS-BARRADO**, Universidad de Málaga, Departamentos de Física Aplicada I & Ingeniería Química, Laboratorio de Materiales y Superficies, Málaga, Spain; E.A. DALCHIELE, Instituto de Física, Facultad de Ingeniería, Montevideo, Uruguay

F:P08 **Crystal and Magnetic Structure of (1-x)BiFeO3 – (x)BaTiO3 Ceramics**
M.V. SILIBIN[1], D.V. KARPINSKY[1, 2, 3], D.V. ZHALUDKEVICH[2], [1]National Research University of Electronic Technology "MIET", Zelenograd, Moscow, Russia; [2]Scientific-Practical Materials Research Centre of NAS of Belarus, Minsk, Belarus; [3]South Ural State University, Chelyabinsk, Russia

F:P09 **Polaron and Magnetoresistance Properties of Ag-doped ZnO Films**
A. KUZANYAN, S. HARUTYUNYAN, N. AGHAMALYAN, R. HOVSEPYAN, S. PETROSYAN, A. POGHOSYAN, A. SARKISYAN, **Y. KAFADARYAN**, Institute for Physicak Research of National Academy of Sciences of Armenia, Armenia

F:P10 **Spectral and Luminescence Investigation of Er,Yb,Ce-doped Ceramics of LiNbO3**
V.V. GALUTSKIY, I.G. PONETAEVA, K.V. PUZANOVSKIY, E.V. STROGANOVA, Kuban State University, Krasnodar, Russia

F:P11 **Nanostructured Si/Al MicroLEDs for VR/AR Applications**
A. SMIRNOV, Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus

F:P12 **Resistive Switching in V-doped Cr2O3 Thin Films Mott Insulator for Memory Applications**
M. RODRIGUEZ FANO, J. TRANCHANT, E. JANOD, B. CORRAZE, P.-Y. JOUAN, L. CARIO, M.-P. BESLAND, Université de Nantes, CNRS, Institut des Matériaux Jean Rouxel, Nantes, France

F:P13 **Influence of Thermal Oxidation Conditions on the Resistive Switching Behavior of WOx/HfO2 Bilayer Structures**
A.A. KOROLEVA, M.G. KOZODAEV, Y.Y. LEBEDINSKII, A.G. CHERNIKOVA, A.M. MARKEEV, Moscow Institute of Physics and Technology, Dolgoprudny, Russia

F:P14 **Effect of W Electrode Structure on Functional Properties of Ferroelectric Y:HfO2 Thin Films**
A. DMITRIYEVA, YU. LEBEDINSKII, A. ZENKEVICH, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow region, Russia

F:P15 **Crystallization of Ferroelectric Hf0.5Zr0.5O2 Films in Memory Capacitors by Large- or Local-area Pulsed Laser Annealing**
N. VOLODINA, A. ZENKEVICH, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow region, Russia; A. EGOROV, O. MAVRITSKY, Moscow Engineering Physics Institute, Moscow, Russia

F:P16 **Integration of Memristive Switching with Sensing in Ag Alloy Nanoparticle based Memsensors**
R. GUPTA[1], N. CARSTENS[1], M. TERASA[2], T. STRUNSKUS[1], F. FAUPEL[1], R. ADELUNG[2], A. VAHL[1], [1]Institute for Materials Science - Chair for Multicomponent Materials, Faculty of Engineering, Kiel University, Kiel, Germany; [2]Institute for Materials Science - Functional Nanomaterials, Faculty of Engineering, Kiel University, Kiel, Germany

F:P17 **Towards Photocatalytically Generated Long-range Connections for Artificial Neural Networks**
B. ADEJUBE[1], M. PAULSEN[2], J. SCHARDT[2], T. STRUNSKUS[1], F. FAUPEL[1], M. GERKEN[2], A. VAHL[1], [1]Institute for Materials Science - Chair for Multicomponent Materials, Faculty of Engineering, Kiel University, Kiel, Germany; [2]Institute of Electrical Engineering and Information Engineering - Chair for Integrated Systems and Photonics, Faculty of Engineering, Kiel University, Kiel, Germany

F:P18 **Carbon Modified TiO2 based Systems for Photochemical Applications**
A. ZOLLO, S. LIVRAGHI, Dipartimento di Chimica, Università di Torino, Torino, Italy

F:P19 **Characterization and Comparison of WO3 with Hybrid WO3-Mo and TiO2 with Hybrid TiO2-ZnO Nanostructures as Photoanodes**
P.J. NAVARRO-GÁZQUEZ[1], M. CIFRE-HERRANDO[1], G. ROSELLÓ-MÁRQUEZ[1], E. BLASCO-TAMARIT[1], M.J. MUÑOZ-PORTERO[1], D.M. GARCÍA-GARCÍA[1], R.M. FERNÁNDEZ-DOMENE[2], **J. GARCÍA-ANTÓN**[1], [1]Ingeniería Electroquímica y Corrosión (IEC), Instituto Universitario de Seguridad Industrial, Radiofísica y Medioambiental (ISIRYM), Universitat Politècnica de València, Valencia, Spain; [2]Departamento de Ingeniería Química, Universitat de Valencia, Burjassot, Spain

F:P20 **Improving the Longevity of Triboelectric Charge**
L. GERMANE[1], L. LAPČINSKIS[1, 2], M. KNITE[1], A. ŠUTKA[2], [1]Institute of Technical Physics, Faculty of Materials Science and Applied Chemistry, Riga Technical University, Riga, Latvia; [2]Institute of Materials and Surface Engineering, Faculty of Materials Science and Applied Chemistry, Riga Technical University, Riga, Latvia

F:P21 **Carbon-carbon Composite Membranes for Fuel Cells of Hydrogen Power Engineering**
V. MARTSENYUK, A. LYSENKO, Saint Petersburg State University of Industrial Technologies and Design, Saint Petersburg, Russia

F:P22 **The Influence of the Pre-heating Temperature and the Ultrasonic Vibration on the Structure of the NiTi Foams produced by Self-Propagating High-temperature Synthesis**
S. BELYAEV, N. RESNINA, D. CHEPELA, Saint-Petersburg State University, Saint-Petersburg, Russia; V. RUBANIK, V. RUBANIK, M. KULAK, Institute of technical acoustics of National Academy of Science of Belarus, Vitebsk, Belarus

F:P23 **Landau-energy Landscape Reconstruction for a Ni-Fe-Ga(Co) Shape Memory Alloy**
K. ZOUBKOVA, P. SEDLÁK, H. SEINER, Institute of Thermomechanics, Czech Academy of Sciences, Prague, Czech Republic; E. VILLA, CNR ICMATE Sede di Lecco, Lecco, Italy; M. TAHARA, H. HOSODA, Institute of Innovative Research (IIR), Tokyo Institute of Technology, Yokohama, Japan; V. CHERNENKO, BCMaterials & University of Basque Country (UPV/EHU), Bilbao, Spain

F:P24 **Large Caloric Effects in Low Hysteresis Ni-Mn-Ga-Cu Ferromagnetic Shape Memory Alloy**
C. SEGUÍ, J. TORRENS, P. LÁZPITA*, **E. CESARI**, Dept. de Física, Universitat de les Illes Balears, Palma, Spain; *Depto. Electricidad y Electrónica, UPV-EHU, Leioa, Spain

F:P25 **Static and Dynamic Characterization of Flexinol Wires in a Biomimetic Perspective**
B. TONDU, Université Fédérale de Toulouse, and LAAS-CNRS, Toulouse, France

F:P26 **Shear Behavior under High Temperature Exposure of Epoxy-coated Carbon Textile-reinforced Mortar**
KYOUNG-KYU CHOI, Soongsil University, Seoul, South Korea

F:P27 **Fabrication and Characterisation of Double Layered Bone Scaffold**
L. YILDIZBAKAN[1], D. ABDULAZIZ[1], N. IQBAL[1], E. JONES[2], N. T. DO[3], P. V. GIANNOUDIS[4], A. JHA[1], [1]School of Chemical and Process Engineering, University of Leeds, Leeds, UK; [2]Clinical Sciences Building, St James University Hospital, School of Medicine, University of Leeds, Leeds, UK; [3]Division of Oral Biology, St James University Hospital, School of Medicine, University of Leeds, Leeds, UK; [4]Academic Department of Trauma and Orthopaedic, School of Medicine, University of Leeds, Leeds General Infirmary, Leeds, UK

F:P28 **Electrically Conductive Composite Materials based on Chitosan and Single-wall Carbon Nanotubes for Regenerative Technologies**
E. DRESVYANINA, Peter the Great Saint Petersburg Polytechnic University, Saint Petersburg, Russia

F:P29 **Obtaining and Investigating the Properties of Bioresorbable Composite Materials for Bone Grafting**
N.A. TAGANDURDYEVA, E.N. DRESVYANINA, G.V. VAGANOV, I.P. DOBROVOLSKAYA, V.E. YUDIN, Peter the Great Saint-Petersburg Polytechnic University, Saint-Petersburg, Russia

F:P30 **A Hybrid Bluetooh-based Network Architecture for Outdoor and Home-monitoring of Human Mobility using Wearables**
E. CASILARI, C. CASTILLO-GUTIÉRREZ, J.M. CANO-GARCÍA et al., Universidad de Malaga, Malaga, Spain

F:P31 **Prelaminar Characterization of Advanced Alloys as Structural Material for LFR**
A. MELI, ESSENTIAL Group, DENERG, Politecnico di Torino, Torino, Italy; M. TARANTINO, S. BASSINI, A. FIORE, C. CIANTELLI, M. ANGIOLINI, D. MARTELLI, ENEA - Department for Fusion and Technology for Nuclear Safety and Security C. R. Brasimone, Camugnano (Bologna), Italy

F:P32 **W/Steel Composites as a Potential Interlayer for the Joining of W and Steel for the First Wall of a Fusion Reactor**
V. GANESH[1, 2], D. DOROW-GERSPACH[1], S. HEUER[1], L. LEICH[2], J. MATEJICEK[3], M. VILEMOVA[3], M. BRAM[2, 4], J. WILLEM COENEN[1, 5], M. WIRTZ[1], G. PINTSUK[1], W. THEISEN[2], C. LINSMEIER[1],
[1]Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung - Plasmaphysik, Jülich, Germany; [2]Institut für Werkstoffe, Lehrstuhl Werkstofftechnik, Ruhr Universität Bochum, Bochum, Germany; [3]Institute of Plasma Physics of the Czech Academy of Sciences, Prague, Czech Republic; [4]Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung - Werkstoffsynthese und Herstellungsverfahren, Jülich, Germany; [5]Department of Engineering Physics, University of Wisconsin Madison, Madison, USA

F:P33 **Investigation of the Interaction of Liquid Tin-lithium Alloy with Austenitic Stainless Ssteel at High Temperatures**
Yu.V. PONKRATOV, I.L. TAZHIBAYEVA, V.S. BOCHKOV, Yu.N. GORDIENKO, Ye.Yu. TULUBAYEV, K.K. SAMARKHANOV, Ye.A. KOZHAKHMETOV, Zh.A. ZAURBEKOVA, Branch "Institute of Atomic Energy" NNC RK, Kurchatov, Kazakhstan; A.V. VERTKOV, JSC "Red Star", "Rosatom" State Corporation, Moscow, Russia

F:P34 **Nanostructured Mo Mirrors Behavior under He Irradiation**
L. CIUPINSKI[1], A.T. KRAWCZYNSKA[1], M. GLOC[1], D. SETMAN[2], M. SPYCHALSKI[1], P. PETERSSON[3], [1]Warsaw University of Technology, Faculty of Materials Science and Engineering, Warsaw, Poland; [2]University of Vienna, Faculty of Physics, Vienna, Austria; [3]KTH Physics Royal Institute of Technology, Stockholm, Sweden

F:P35 **Investigation of High-Temperature Corrosion Processes of the IGR Uranium-graphite Fuel using TGA and MS Complex Techniques**
K.K. SAMARKHANOV, Yu.N. GORDIENKO, Yu.Yu. BAKLANOVA, Yu.V. PONKRATOV, T.V. KULSARTOV, Zh.A. ZAURBEKOVA, V.S. BOCHKOV, Ye.Yu. TULUBAYEV, V.K. TSKHE, Ye.A. KOZHAKHMETOV, Institute of Atomic Energy Branch of the National Nuclear Center of the Republic of Kazakhstan, Kurkatov, Kazakhstan

F:P36 **Complex Thermo Gravimetric and Mass-spectrometric Studies of Non-irradiated Highly Enriched Uranium-graphite Fuel of the IGR**
Yu.N. GORDIENKO, V.S. BOCHKOV, Ye.T. KOYANBAYEV, T.V. KULSARTOV, Yu.V. PONKRATOV, K.K. SAMARKHANOV, Ye.Yu. TULUBAYEV, V.K. TSKHE, Ye.A. KOZHAKHMETOV, Institute of Atomic Energy Branch of the National Nuclear Center of the Republic of Kazakhstan, Kurchatov, Kazakhstan

F:P37 **Modeling of Interdiffusion and Kirkendall Effect on the Base of Alternative Theory of Interdiffusion**
V.A. MAKAROVA, National Research Nuclear University “MEPhI” (Moscow Engineering Physics Institute), Moscow, Russian Federation; A.V. NAZAROV, Institute for Theoretical and Experimental Physics named by A.I. Alikhanov of NRC "Kurchatov Institute", Moscow, Russia

F:P38 **Multiscale Modelling of Interdiffusion and Kirkendall Effect in System with Cubic Structure at Different Temperatures**
G.V. SERGEEV[1], V.A. MAKAROVA[1], A.V. NAZAROV[1, 2], [1]National Research Nuclear University “MEPhI” (Moscow Engineering Physics Institute), Moscow, Russian Federation; [2]Institute for Theoretical and Experimental Physics named by A.I. Alikhanov of NRC "Kurchatov Institute", Moscow, Russia

INFORMATION TO AUTHORS & PARTICIPANTS

LOCATION AND DATES

CIMTEC 2022 will be held in Perugia, splendid chief town of Umbria region, placed in the middle of Central Italy. The city is about 170 km from Rome and is placed in a strategic position to reach the most interesting historical and tourist places in Umbria, such as Assisi, Orvieto, Spoleto, Todi, Spello, Gubbio, Montefalco, Trevi, Trasimeno Lake and several others.

CIMTEC 2022 includes the ***15th International Ceramics Congress (June 20-24, 2022***) and the ***9th Forum on New Materials* (*June 25-29, 2022*).**

CONFERENCE SECRETARIAT

CIMTEC 2022
Corso Mazzini 52
48018 Faenza
Italy
Tel.: +39 0546 22461
E-mail: congress@technagroup.it

CONFERENCE VENUE

Centro Congressi Hotel Quattrotorri
at Best Western Hotel Quattrotorri Perugia
Via Corcianese 260
06132 Perugia - Italy

The Conference Venue is about 8 km outside Perugia center.

A complimentary transfer service between the "Conference Hotels" and the Conference Venue will be made available for Conference Members.

Technical Sessions of the **Ceramics Congress** will start Tuesday June 21 morning and continue until Friday June 24.

Technical Sessions of the **Forum on New Materials** will start Sunday June 26 morning and continue until Wednesday June 29.

LANGUAGE

English will be the official language for CIMTEC 2022.

REGISTRATION DESK AND SECRETARIAT

Registration desk and secretariat will be open at the **Congress Center** according to the following time schedule:

International Ceramics Congress

June 20	Monday		15.00-19.00
June 21	Tuesday	8.00-13.00	14.30-19.00
June 22	Wednesday	8.00-13.00	14.30-19.00
June 23	Thursday	8.00-13.00	14.30-19.00
June 24	Friday	8.00-13.00	14.30-18.30

Forum on New Materials

June 25	Saturday		15.00-19.00
June 26	Sunday	8.00-13.00	14.30-19.00
June 27	Monday	8.00-13.00	14.30-19.00
June 28	Tuesday	8.00-13.00	14.30-19.00
June 29	Wednesday	8.00-13.00	14.30-18.30

On site registration payments can be made by credit card (VISA, MASTERCARD), PagoBANCOMAT or cash in EUR or US$.

HOW TO REACH PERUGIA

Perugia is located in the Umbria Dictrict (Central Italy), about 170 Km from Rome. It can be reached:

By Plane:

The most suitable Italian airport for delegates coming from overseas countries is the Intercontinental Rome Airport (Aeroporto di Roma Fiumicino, "Leonardo da Vinci Airport"). Flight details available at https://www.adr.it/web/aeroporti-di-roma-en/

Direct flights to Perugia (International Airport of Umbria-Perugia "San Francesco d'Assisi") are also scheduled. Flight details are available at https://www.airport.umbria.it/en/

To reach Perugia from Rome:

By car:

From Rome, take the A1 Motorway and go out at the Orte exit. Then take the E45 Motorway to the Perugia exit.

By Train:

From the train station located inside the airport of Fiumicino (station "Fiumicino Aeroporto"), you can take the "Leonardo express" (departures every 30 minutes) to the Rome Central Railway Station (Roma Termini station). From Roma Termini you find the trains to "Perugia" station (departures about every hour, duration about 3 hours).

Please visit web site https://www.trenitalia.com/en.html to find all available connections

By bus:

Sulga buses (https://www.sulga.it/linee/) make direct connections from Rome Fiumicino Airport to Perugia once a day.
Departures from Fiumicino Airport: from the International Arrivals Terminal 3.
From Monday to Saturday: Departure at 14:30, with arrival in Perugia Piazza Partigiani (city center) at 18:15
On Sunday: Departure at 16:30, with arrival in Perugia Piazza Partigiani (city center) at 20:15
Ticket must be bought online at the following link: https://sulga.sotrap.it/home/getcorse

SPECIAL CIMTEC BUS TRANSFER SERVICE FROM ROME AIRPORT TO PERUGIA

*A bus transfer service will be arranged on **Monday June 20** and on **Saturday June 25** from Fiumicino Rome Airport "Leonardo da Vinci" to the "Conference Hotels" in Perugia and final stop in "Piazza dei Partigiani" (near city center). The departures are as follows: 10.30/11.00, 14.30/15.00, 17.30/18.00, 20.00/20.30, 22.30/23.00.*
CIMTEC staff will welcome participants at the exit of International Arrival Terminals from 10.00 a.m. on June 20 and June 25. You can buy your ticket amounting to 15 EUR directly in the bus by cash.

PERUGIA CONNECTION TO CONGRESS CENTER

By train

From Central Railway Station "Perugia" you may reach "Ellera-Corciano" station (100 meters from the Congress Center) about every hour from 6.15 to 20.55, train ride 10/15 min.
From "Ellera-Corciano" Station to Central Railway Station "Perugia" about every hour from 7.00 to 22.26, train ride 10/15 min.
Timetable may change depending on the day of the week, please see https://www.trenitalia.com/en.html

By bus

From the centre of Perugia to the Congress Center there are two lines (Line F and Line G), one every hour from 6.00 to 21.00, bus ride 40 min, the other every half an hour from 5.30 to 21.30, bus ride 45 min (proper information may be asked at the hotels)

By car

From Perugia city center about 15-20 min.

By taxi

From Perugia centre about 15-20 min. Fare about 20/25 EUR each way.

CIMTEC daily shuttle connections to and from the Congress Center

A complimentary shuttle service will be available to delegates to reach the Congress Center for the beginning of the Technical Sessions and come back at the end of the Technical Sessions. The service will be available from Tuesday 21 to Friday 24 and from Sunday 26 to Wednesday 29. Departures and arrivals are from and to Piazza Partigiani (near the city center).

Bus departures to Congress Center: 8.00 a.m. from Piazza Partigiani

Bus departures from Congress Center: 19.00 to 19.15 to Piazza Partigiani

A special complimentary shuttle bus connection from each "Conference Hotel" to and from the Congress Centre will be made available to delegates who booked their room through the "Hotel Booking Center". The service will be active as from the Registration day (June 20 afternoon for the Ceramics Congress and June 25 afternoon for the Forum on New Materials) and during the whole conference. Time schedule will be available at each hotel.

PRESENTATION FORMATS

Oral Presentations

Electronic presentation (Power Point) facilities will be available including LCD high resolution projector and PC. Cost for any special audio-visual request will be the responsibility of the individual speaker.
The timing for each lecture (day, and morning/afternoon sessions may be read in the Session Timetable (pages 6-9 for the Ceramics Congress and pages 51-54 for the Forum on New Materials).

Poster Presentations

Poster board: 200 cm (vertical) x 100 cm (horizontal). Pins can be used to attach the poster. Authors are kindly requested to be present at their poster for discussion with attendees during the Poster Session. It is each author's responsibility to remove the poster immediately after the end of the session. The organisers do not assume any responsibility for posters left up after this time. Guidelines for Poster preparation are available at the Conference web site. Attendance by at least one of the authors is mandatory for poster presentation.

ABSTRACTS

The abstracts of all Oral and Poster Presentations will be made available at the conference web site well in advance of the beginning of the conference, including also the Plenary Lectures that will be given at the Ceramics Congress.

REGISTRATION AND FEES

All those planning to attend CIMTEC 2022 must register and receive badges. Advanced and late registrations fees are offered as well as special student registration fees.
Registration rates are in EUR, but payments may be also effected in US$ at the exchange rate of the day in which the payment is made.

	CERAMICS CONGRESS (June 20-24)	FORUM ON NEW MATERIALS (June 25-29)	WHOLE CIMTEC (CONGRESS+FORUM) (June 20-29)
Early by April 30, 2022			
Full Member*	740.00 EUR	740.00 EUR	1,260.00 EUR
Student**	410.00 EUR	410.00 EUR	760.00 EUR
Invited Lecturer***	370.00 EUR	370.00 EUR	900.00 EUR
After April 30 and On Site			
Full Member*	840.00 EUR	840.00 EUR	1,360.00 EUR
Student**	480.00 EUR	480.00 EUR	830.00 EUR
Invited Lecturer***	420.00 EUR	420.00 EUR	950.00 EUR

* *authors of contributed lectures (L), posters (P), other Participants*
** *evidence of student status must be e-mailed to Congress Secretariat*
*** *and/or IAB Member*

Fees include 22% VAT, general and secretariat costs, participation in the scientific sessions, coffees tickets, printed booklet of the final programme and other conference material, and complimentary participation in the Social Programme.

All registrations must be done on-line at http://2022.cimtec-congress.org/on-line-registration

Participants are encouraged to take advantage of the discounted rate, applicable only if **both** registration and payment are received by April 30.

PUBLICATION POLICY

CIMTEC 2022 PROCEEDINGS will be published as a Special Issue of the high-rated journal Ceramics International. All papers will be subjected to the normal peer review process. A purposedly dedicated window for papers submission will be opened at journal website as from July 1 to July 30.

FINAL PROGRAMME

The booklet of the Final Programme including titles and detailed timetable of Lectures, Posters and "HOT POSTERS" will be given at the registration desk. It also will be hopefully available on the conference web site approx 10 days before the beginning of the congress.

VISA ASSISTANCE

All travel, lodging and registration expenses will be the responsibility of the individual participants. Special letters of invitation to be used for visa application will be provided upon written request by the participant to the conference organizers.
As the application for a visa may be a lengthy process, we recommend to start your visa application process in due advance.
Those attendees who need a visa to entry in Europe are suggested to contact CIMTEC Secretariat, *congress@technagroup.it* as soon as possible indicating the following information: date of birth, place of birth, nationality, title (Ms., Mr., Dr., Prof.), affiliation, full postal address, passport number, issue and expiring dates of the passport and any other information useful to obtain visa.
All letters of invitations will be sent by priority mail and PDF e-mail attachment.
CIMTEC organisation is not available to contact Embassies in support of an individual attempting to gain entry to attend the Conference.

CURRENCY, BANKING AND INSURANCE

Banks are generally open Monday to Friday from 8.30 a.m. to 1.30 p.m. and from 3.00 p.m. to 4.00 p.m. Banks are closed on Saturdays and Sundays. Major credit cards are accepted in most hotels, restaurants and shops.
The Organizers do not assume any responsibility for participant's personal accidents, sickness, thefts or property damage.

SOCIAL PROGRAMME

Ceramics Congress

Welcome Party	June 21 evening
Closure Dinner	June 24 evening

Forum on New Materials

Welcome Party	June 26 evening
Closure Dinner	June 29 evening

The social programme is free for all registered members. Companions may register on site and pay by cash.

CANCELLATION

Prepaid registration fees are refundable, minus a 10% administration fee, if written notification of the cancellation is received before June 1, 2022. No refund can be made for cancellations received after June 1, 2022. However delegate substitution can be accepted.

"HOT" POSTERS
(Last-minute Posters)

Late-news papers will be accepted for poster presentation, provided the following mandatory conditions be verified:

- *Only Poster submission from Presenting Authors who **do not** have oral or poster presentations already scheduled in the conference programme will be accepted.*
- *Only one "HOT POSTER" may be contributed by the same Presenting Author.*
- *Submission shall be accompanied by the payment of the registration fee.*
- *The submission deadline of **April 30, 2022** must be strictly respected.*

To submit go to:
http://2022.cimtec-congress.org/on-line-registration

The Conference Secretariat will confirm receipt of the Hot Poster and will supply the Presenting Author with proper information about Poster Presentation.

WEATHER

The weather in Perugia at the end of June is usually fine with temperatures ranging from 24 to 29 °C during the day and 15 to 17 °C during the night. Clothing suitable for (early) summer is recommended.

OPTIONAL TOURS FOR CONGRESS MEMBERS AND COMPANIONS

Ceramics Congress

Guided tour to Passignano & Trasimeno Lake
June 21, afternoon

Guided tour to Spoleto & Montefalco
June 22, full day

Guided tour to Assisi & Spello
June 23, full day

Guided tour to Gubbio
June 24, morning

Forum on New Materials

Guided tour to Passignano & Trasimeno Lake
June 26, afternoon

Guided tour to Spoleto & Montefalco
June 27, full day

Guided tour to Assisi & Spello
June 28, full day

Guided tour to Gubbio
June 29, morning

Registration and payment for optional tours must be made on site by cash. The participation fee may be found as from page 97 to page 100.

HOTEL ACCOMMODATION

Rooms have been reserved by Hotel Booking Center Quattrotorri Perugia in a number of hotels (Conference Hotels). The following prices have been agreed:

Hotel category	Double single use	Double / Twin
5 star	160.00	120.00
4 star	119.00	81.00
3 star superior	89.00	60.00
3 star	79.00	55.00

All rooms have private bath or shower. Third occupancy with additional bed in double room: 30% discount on third occupancy. Children 0-2 years old: no charge with no additional bed. Prices do not include the city tax to be paid directly to the hotel for max 3 nights.

Please fill the Hotel Booking Form at http://2022.cimtec-congress.org/hotel-booking-form and submit.

SUMMARY OF DEADLINES

April 30, 2022
Registration at reduced rate

June 1, 2022
Conference Fees Cancellations (90% refund)

FURTHER INFORMATION

For scientific and organizational aspects of the conference ***(until June 10)***

CIMTEC 2022
Ms Stefania Bianchedi
Corso Mazzini, 52
48018 FAENZA - ITALY
Tel. +39 0546 22461
e-mail: congress@technagroup.it

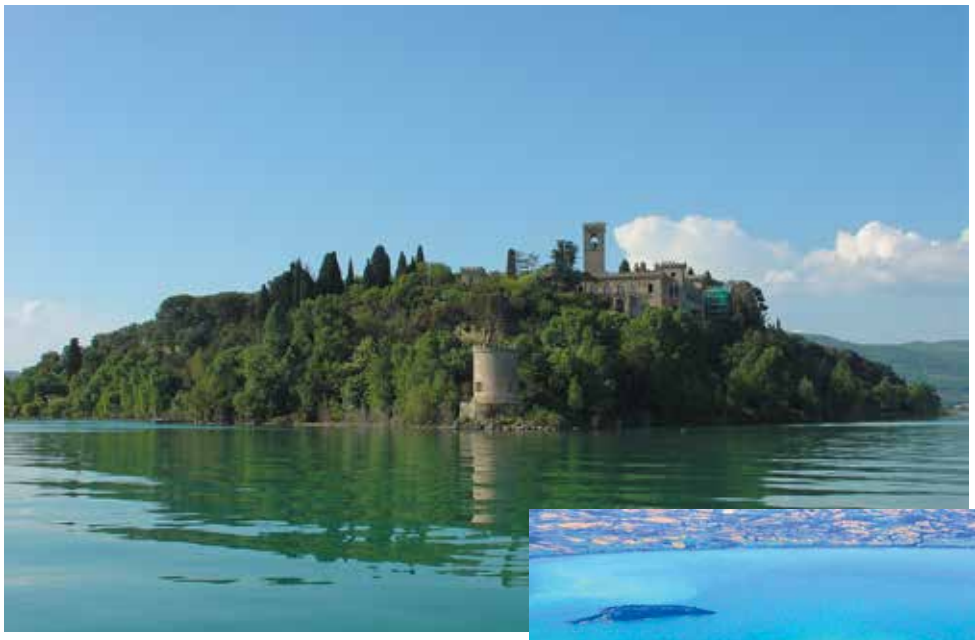
For aspects related to hotel accommodation (booking, schedule changes, cancellations, etc.)

Hotel Booking Center Quattrotorri
Via Corcianese 260
06132 Perugia - Italy
Tel. +39 075 5171722
Fax +39 075 5171707
e-mail: cimtec2022@hotelquattrotorriperugia.com

PASSIGNANO & TRASIMENO LAKE (afternoon)

Ceramics Congress: Tuesday June 21 - Forum on New Materials: Sunday June 26

Passignano sul Trasimeno (Passignano on Trasimeno Lake) is placed on the lakeshores. The town was built in between the 16th and the 17th Century whereas its suggestive historical centre surrounding the fortress dates back to medieval and also to most ancient times. After a view of the historical centre, participants will take a ferry to visit Isola Maggiore, the biggest island of Lake Trasimeno.
The lake is south of the river Po and north of the nearby river Tiber. Only two minor streams flow directly into the Lake and none flows out. The water level of the lake fluctuates significantly according to rainfall levels and the seasonal demands from the towns, villages and farms near the shore. The first civilization to inhabit this area was the Etruscans; three of the main Etruscan cities - Perugia, Chiusi, and Cortona - are within 20 kilometres (12 miles) of the lake. Little physical evidence remains from the period of Etruscan or later Roman settlement. Castiglione del Lago, has some Roman ruins and its main streets are structured like a chessboard in the Roman style. The lake includes three islands: Isola Maggiore, Isola Polvese and Isola Minore.



Meeting point: Congress Center Quattrotorri at 14.30. Return to Perugia at about 19.00.
The participation fee (40 EUR) includes bus transfer, English speaking hostess and local guides, served lunch and ferry ticket.

SPOLETO & MONTEFALCO (full day)

Ceramics Congress: Wednesday June 22 - Forum on New Materials: Monday June 27

Spoleto, (Latin ***Spoletium***) is an ancient city in the Perugia district located at the head of a large, broad valley, surrounded by mountains. The town has long occupied a strategic geographical position. It appears to have been an important town to the original Umbri tribes, who built walls around their settlement in the 5th century BC, some of which are visible today. An ancient Roman colony, after Ostrogoth and Lombard, medieval town contended between the Pope and the Emperor, between Guelfs and Ghibellines, cultural centre during the Renaissance and Bishop seat, the history of the City has left an exceptional architectonic and art cultural heritage within a splendid naturalistic context. The Acquedotto delle Torri (Towers Aqueduct) with its majesty and beauty welcomes us when joining Spoleto. The tour includes:

- Town walls, "Torre dell'Olio" (Oil Tower) and Porta Fuga (Fuga Door)
- Roman Theatre
- Domus of Flavia Vespasia Pollia Domus, mother of Roman Emperor Vespasiano
- Arco di Druso (Arch of Drusus)
- Roman church of Sant'Eufemia
- Cathedral square
- Ponte delle torri (Tower Bridge) connecting the historical centre. The bridge, built in between the 12th and 13th Century, is 280 meters long and 82 meters high.

Lunch: Restaurant in Spoleto

Montefalco, a charming tow built on a hill overlooking the valley linking Perugia with Spoleto, has been settled since the times of the Umbri. It has been under the successive domination of the Romans, Lombards, being called **Coccorone** in the Middle Ages. In 1249 it was sacked by Frederick II, but was soon rebuilt with the modern name. From the 13th century it had been a free comune under the domination of local nobles and merchants, but later, as with many other Umbrian locales, the comune gave way to government by a signoria (1383-1439). In 1446 it fell under the rule of the Papal States where it remained until the unification of Italy in 1861. Montefalco has several churches, some in the Romanesque, some in the Gothic and some in the Renaissance style. The 13th century Palazzo Comunale ("Town Hall") has a mullioned window from the original edifice and a 15th-century portal. Also notable are the gates in the walls, including Porta Sant'Agostino, Porta Camiano and Porta Federico II.

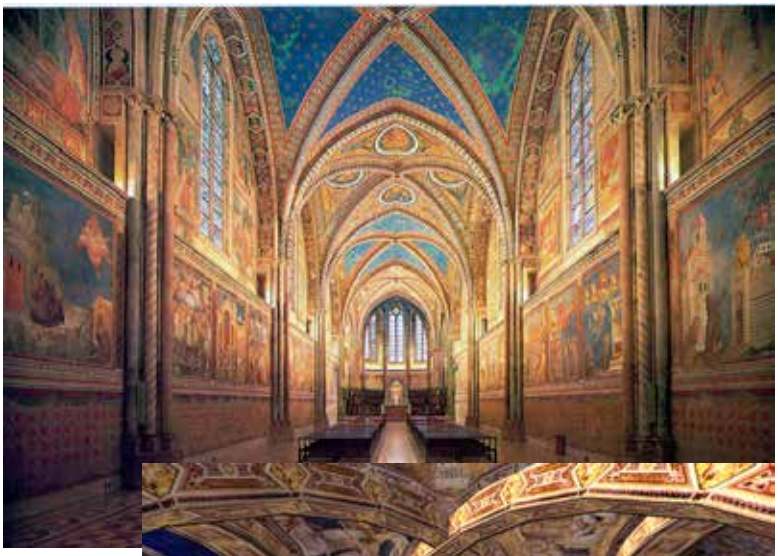
The tour includes:

- Saint Francis Church
- Architectural lodges
- Main Square
- Consuls Palace and Palace of the Podestà
- Cathedral
- Ducal Palace
- Medieval street sand panoramic views

Meeting point: Congress Center Quattrotorri at 9.00. Return to Perugia at about 19.00.
The participation fee (75.00 EUR) includes bus transfer, English speaking hostess and local guides, and served lunch.

ASSISI & SPELLO (full day)

Ceramics Congress: Thursday June 23 - Forum on New Materials: Tuesday June 28



Placed on the slope of Subasio Mountain (Monte Subasio), **Assisi** (https://en.wikipedia.org/wiki/Assisi) is without any doubt the most internationally renowned city from Umbria Region its fame mainly deriving from being the birth place of San Francis (San Francesco) the patron saint of Italy. UNESCO collectively designated the Franciscan structures of Assisi as a World Heritage Site in 2000. The city retains vestiges of the Roman age whereas the Middle Ages urban planning remains practically untouched.
The Basilica of San Francesco d'Assisi (St. Francis) is the major sight in Assisi. The Franciscan monastery, il Sacro Convento, and the lower and upper church (Italian: *Basilica inferiore* and *Basilica superiore*) of St Francis were begun in 1228, and completed in 1253. The lower church has frescoes by the late-medieval artists Cimabue and Giotto; the upper church houses frescoes of scenes in the life of St. Francis previously ascribed to Giotto, but now thought to be by artists of the circle of Pietro Cavallini from Rome.

The visit includes:

- Basilica di San Francesco (St. Francis Church)
- Piazza del Comune (Town Hall square)
- Tempio della Minerva (Minerva Temple)
- Chiesa Nuova (New Church built over the presumed parental home of St. Francis)
- Oratorio di San Francesco piccolino (Oratory of St. Francis)
- Basilica di Santa Chiara (Basilica of St. Clare)

Lunch: Restaurant in Assisi

Spello (in Antiquity: Hispellum) (https://en.wikipedia.org/wiki/Spello) is an ancient town placed on the lower southern flank of Mt. Subasio, about 6 km from Assisi. The old walled town lies on a regularly NW-SE sloping ridge that eventually meets the plain. From the top of the ridge, Spello commands a good view of the Umbrian plain towards Perugia; at the bottom of the ridge, the town spills out of its walls into a small modern section (or *Borgo*).
Spello remains four monumental gates and a long track of walls of Roman Age, besides the ruins of Roman amphitheatre and holy buildings. The Middle Ages town is one of the more fascinating of the Umbria Region.

The visit includes:

- Porta Urbica (Urbica Gate)
- Mura Romane (Roman Walls)
- Porta Consolare (Consular Gate)
- Chiesa Collegiata di Santa Maria Maggiore (Santa Maria Maggiore Church with Pinturicchio frescoes)
- Palazzo Comunale (Medioeval Tawn Hall)
- Palazzo Cruciali (Cruciali Palace)
- Belvedere (panoramic viewpoint)
- Porta Venere con Torri di Propezio (Venere Gate and Propezio Towers)

Meeting point: Congress Center Quattrotorri at 9.00. Return to Perugia at about 19.00. The participation fee (80.00 EUR) includes transportation, city entrance taxes, English speaking hostess and local guides, headphone & earphones for basilica and lunch.

GUBBIO (morning)

Ceramics Congress: Friday June 24 - Forum on New Materials: Wednesday June 29

Gubbio (https://en.wikipedia.org/wiki/Gubbio), located on the lowest slope of Mt. Ingino, a small mountain of the Apennines, is among the best preserved splendid Middle Ages city of Umbria Region. The city's origins are very ancient. The hills above the town were already occupied in the Bronze Age, followed by Umbrian people and Roman conquest in the 2nd century BC. Gubbio became very powerful in the beginning of the Middle Ages and became part of the Papal States in 1631. The historical centre of Gubbio has a decidedly medieval aspect: the town is austere in appearance because of the dark grey stone, narrow streets, and Gothic architecture. Many houses in central Gubbio date to the 14th and 15th centuries, and were originally the dwellings of wealthy merchants.
Among most important buildings and sites in the city are: Roman Theater and Roman Mausoleum, Palazzo dei Consoli, Duomo, Palazzo Ducale and several others.

The visit includes:

- Chiesa di San Francesco (St. Francis Church)
- Logge (Open galleries)
- Piazza Grande (Main Square)
- Palazzo dei Consoli e Palazzo del Podestà (Middle Ages public palaces)
- Cattedrale (Cathedral)
- Palazzo Ducale (Dukes Palace)
- Middle Ages alleys and panoramic views

Meeting point: Congress Center Quattrotorri at 9.00. Return to Perugia at about 13.00.
The participation fee (35 EUR) includes transportation, city taxes, English speaking guide.

CIMTEC 2022

Flowsheet

	JUNE 25		JUNE 26		JUNE 27		JUNE 28		JUNE 29	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M	A.M.	P.M.
REGISTRATION										
SYMPOSIUM FA				FA	FA	FA	FA	FA	FA	FA
SYMPOSIUM FB				FB	FB	FB	FB		FB	FB
SYMPOSIUM FC				FC	FC	FC	FC			
SYMPOSIUM FD				FD	FD	FD	FD		FD	FD
SYMPOSIUM FE						FE	FE	FE	FE	
SYMPOSIUM FF				FF	FF	FF	FF	FF	FF	FF
SYMPOSIUM FG				FG	FG	FG	FG	FG	FG	FG
CONFERENCE FH				FH	FH	FH	FH	FH	FH	FH
SYMPOSIUM FI				FI	FI	FI	FI	FI	FI	FI
SYMPOSIUM FJ				FJ	FJ	FJ	FJ	FJ		
SYMPOSIUM FK				FK	FK	FK	FK	FK	FK	FK
SYMPOSIUM FL				FL	FL	FL	FL	FL	FL	
SYMPOSIUM FM				FM	FM	FM	FM	FM	FM	FM
SYMPOSIUM FN				FN	FN	FN	FN	FN		
SYMPOSIUM FO				FO	FO	FO	FO	FO	FO	FO
SYMPOSIUM FP				FP	FP	FP	FP	FP	FP	
CONFERENCE FQ				FQ	FQ	FQ	FQ	FQ	FQ	FQ
CONFERENCE FR				FR	FR	FR	FR	FR	FR	FR
POSTER MOUNTING				◆						
POSTER DISCUSSION										◆
SOCIALS			●							●

PLENARY SESSION

9th FORUM ON NEW MATERIALS

● WELCOME RECEPTION ● CLOSURE DINNER

A selection of endorsing and cooperating bodies of CIMTEC Conferences

Commission of the European Communities • National Research Council, Italy • Italian National Agency for New Technology, Energy and the Environment • Academy of Sciences of Romania • Academy of Sciences of Russia • Academy of Sciences of Ukraine • World Academy of Ceramics • International Union of Materials Research Societies • International Ceramic Federation • International Institute of Welding • ASM International • International Union of Pure and Applied Chemistry • International Union of Pure and Applied Physics • International Standards Organization • International Thermoelectric Society • The International Society for Optical Engineering • International Association for Structural Control and Monitoring • Versailles Project for Advanced Materials and Standards • European Association of Composite Materials • European Committee for Standardization • European Optical Society • European Society for Biomaterials • European Thermoelectric Society • EURO-CVD • Federation of European Materials Societies • Royal Institute of British Architects • American Carbon Society • Brick Institute of America • The American Institute of Architects • American Powder Metallurgy Institute • American Society for Composites Institute of Electric and Electronic Engineers • Italian Center for Composites • Italian Institute for the Physics of Materials • Italian Physical Society • Italian Society for Optics and Photonics • Japanese Orthopaedic Ceramic Implant Society • Optical Society of America • Society for Biomaterials, USA • The Electrochemical Society, USA • The Japan Society for Applied Physics • The Japan Society for Biomaterials • The Japan Society of Mechanical Engineers • The Japan Society for Composite Materials • The Society for Fiber Science and Technology of Japan

Consiglio Nazionale delle Ricerche

ENEA
ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES ENERGY AND THE ENVIRONMENT

WORLD ACADEMY OF CERAMICS

ICF

INTERNATIONAL UNION OF MATERIALS RESEARCH SOCIETIES

TECHNA GROUP www.cimtec-congress.org