



19th - 22nd September



2022 Fall Meeting

Conference and exhibition held at the Main Campus of the
Warsaw University of Technology
Plac Politechniki 1 - Warsaw, Poland



European Materials
Research Society



Warsaw University
of Technology



Polish Materials
Science Society



Institute of Physics
Polish Academy of Sciences

CONFERENCE

PROGRAMME

19 - 22 September



2022 Fall Meeting

Materials Advances

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Supporting materials science
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Fundamental questions
Elemental answers

Registered charity number: 207890



Welcome

We are pleased to welcome you to the E-MRS 2022 Fall Meeting.

The European Materials Research Society (E-MRS) was established in 1983 through the initiative of individual european materials scientists. A number of european materials scientists who attended the MRS meetings in the U.S.A. realised that such a society could be of benefit to Europe to enhance the links between materials science and industry and to provide a voice for the materials community. Both the E-MRS Spring and Fall Meetings provide an international forum to discuss recent advances in the field of materials science.

This year the conference is again being held in the Central Campus of the Warsaw University of Technology and is the 20th E-MRS Fall Meeting to be held in Warsaw since 2002. The conference will consist of:

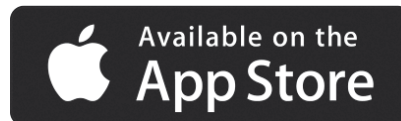
- 16 parallel symposia,
- A plenary session which includes the presentation of the Jan Czocharlski Award,
- An Exhibition of products and services of interest to the conference participants.

Conference APP

DOWNLOAD MOBILE APP



1. Scan the QR code with an external QR code reader or go to the market in your phone (App Store or Google Play) and type 'Meeting Application'.
2. Download Meeting Application and open it.
3. Type NAME OF THE EVENT in the gap on the screen or scan the QR code with the Meeting Application internal QR code reader.
4. Follow the instructions on the screen and sign in / log in).



You will find:

- Updated conference programme
- Latest news from organisers
- Maps to guide you to all the conference rooms

Conference Chairpersons



Andrzej MYCIELSKI

Institute of Physics
PAS
Poland



Anke WEIDENKAFF

Fraunhofer Materials Recycling
and Resource Strategies IWKS
Germany



Anthony J. KENYON

UCL
U.K.



Giuseppina PADELETTI

ISMN-CNR
Italy

Organisers



European Materials Research Society

**Warsaw University
of Technology**

Warsaw University of Technology

E-MRS Officers



**Joan Ramon
MORANTE**
President
 IREC
 Spain



Giuseppina PADELETTI
Vice President
 ISMN - CNR
 Italy



Anthony J. KENYON
Vice President
 UCL
 U.K.



Paul SIFFERT
General Secretary
Past President
(1983-1988)
 E-MRS Headquarters
 France

Organisers



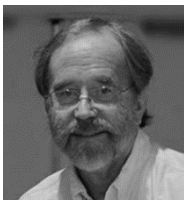
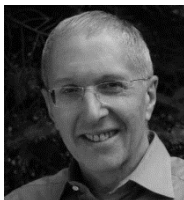
Polish Materials Research Society



Institute of Physics, PAS

Plenary Session

Wednesday, September 21st, 2022, 9:00, Main Hall

09:00	Introduction – Conference Organisers	
09:10	Welcome Address by Rector of the Warsaw University of Technology	
09:20	Welcome Address by the E-MRS President	
09:30	Presentation of the Jan Czochralski Award to Prof. Joseph E. Greene	
09:45	Czochralski Award laureate - Prof. Joseph E. Greene, University of Illinois, USA (lecture delivered by Prof. Lars Hultman, Linköping University, Department of Physics, IFM, Sweden) Atomic-level control during filmgrowth under highly kinetically constrained conditions; A review of Prof. Joe Greene's research	
10:30	Prof. Sir Michael Pepper, University College London, Faculty of Engineering Science, U.K. Electron Interactions in Quasi-1D Semiconductor Nanostructures	
11:15	Prof. Mauricio Terrones, Penn State University, Department of Materials Science and Engineering, USA Defect Engineering in 2D materials: Magnetism, bio-applications and catalysis	

SYMPOSIA

FUNCTIONAL MATERIALS

- Symposium A:** Materials, components and characterization of energy harvesters for self-powered electronics
- Symposium C:** From predictive modelling to machine learning as versatile tools for materials design
- Symposium E:** Sustainable materials for chemical and electrochemical energy storage
- Symposium R:** Integration of advanced materials on silicon: from classical to neuromorphic and quantum applications
- Symposium S:** Phase transitions and properties of ferroics in the form of single crystals, ceramics and thin films II

WIDE-BAND-GAP SEMICONDUCTORS

- Symposium F:** Ultra wide-band-gap semiconductors for energy and electronics (UWBG2E)
- Symposium G:** New frontiers in wide-band-gap semiconductors and heterostructures for electronics, optoelectronics and sensing

NANOMATERIALS

- Symposium H:** Innovative and advanced epitaxy
- Symposium I:** Group-IV semiconductor materials for nanoelectronics and cryogenic electronics
- Symposium K:** Materials- nanoelectronics and nanophotonics
- Symposium L:** Doping at the nanoscale: new challenges and advanced applications
- Symposium M:** Defect-induced effects in nanomaterials

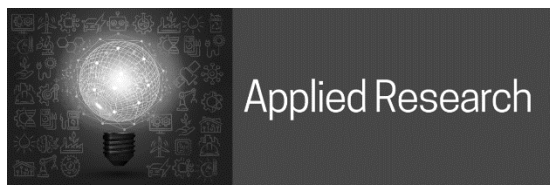
MATERIALS FOR A SUSTAINABLE TRANSITION

- Symposium N:** Modelling and characterization of novel functional materials for green energy, sensing, and catalysis applications
- Symposium O:** Circular materials and resource chemistry
- Symposium P:** Breakthrough zero-emissions energy storage and conversion technologies for carbon-neutrality
- Symposium Q:** Advanced catalytic materials for (photo)electrochem. energy conversion III

GENERAL TIMETABLE

Symposium symbol	Symposium location		Monday September 19 th	Tuesday September 20 th	Wednesday September 21 st	Thursday September 22 nd
Symposium A	MINI Building	328	09:15-17:30 (1)	09:00-17:30	14:00-17:30	09:15-10:30
Symposium C	MINI Building	103	08:30-15:30 (1)	11:00-12:15 (2)		
Symposium E	MINI Building	107	09:05-17:30(1)	09:00-17:30	14:00-17:30	09:00-12:30
Symposium R	MINI Building	101	14:00-15:30 (1)	09:00-17:45	14:00-16:45	
Symposium S	MINI Building	102	09:00-17:30 (1)	08:30-17:15	14:00-17:15	09:30-17:30
Symposium F	Main Building	144	09:00-18:00	09:00-17:00 (2)	14:00-17:15	
Symposium G	Main Building	306	09:00-17:15 (1)	09:00-17:30 (2)	14:00-17:15	09:00-17:00
Symposium H	Main Building	231	09:00-17:30	09:00-17:30 (2)	14:00-17:30	09:00-15:45
Symposium I	Main Building	219	14:00-17:15	09:00-12:30 (2)	14:00-15:30	14:00-17:00
Symposium L			09:00-12:30	14:00-17:30 (2)	16:00-17:30	09:00-12:30
Symposium K	Main Building	134	08:00-17:30	08:00-17:30 (2)	13:00-18:15	09:00-16:30
Symposium M	Main Building	226		09:00-17:30 (2)	14:30-17:30	09:00-12:30
Symposium N	Main Building	315	09:00-17:15 (1)	09:00-18:15	14:00-17:30	09:00-17:45
Symposium O	Main Building	206	09:00-17:15 (1)	09:00-12:30		
Symposium P	Main Building	327	09:00-17:30	09:00-17:15	14:00-17:15	
Symposium Q	Mini Building	309	09:00-17:35 (1)	09:00-17:25	14:00-17:45	09:00-10:30
Poster Session	Main Building Small Hall		(1)17:30 -19:30	(2) 17:30 -19:30		
Plenary Session	Main Building Main Hall				09:00 -12:30	
SATELITE EVENTS:						
Thesis competition	Main Building	208	12:45-13:45	12:45-13:45		
Workshop Material Recycling	Main Building	206			09:00-17:15	
Computer Lab - Main Building 162						
LUNCH Main Building ground floor - I and area II, III						

3Dcavenger



Symposium A

Sessions: Room 328 | MINI Building

Poster Session: Small Hall | Main Building

Functional materials:

Materials, components and characterization of energy harvesters for self-powered electronics

Symposium Organizers: **Ana BORRAS** ICMS-CSIC- US Spain

Anjana DEVI Ruhr- Universität Bochum Germany

Joe BRISCOE Queen Mary University of London U.K.

Mariona COLL Institute of Materials Science of Barcelona (ICMAB-CSIC) Spain

Symposium A Program

MONDAY, 19 SEPTEMBER 2022

9:05 **Welcome**

Multienergy Harvesting : Ana Borr s

9:15 **Band gap engineering of piezoelectrics for multi-energy harvesting -
Tricks, lessons, and opportunities** **A.01.01**

Yang Bai

Microelectronics Research Unit, Faculty of Information Technology and
Electrical Engineering, University of Oulu, FI-90570 Oulu, Finland

9:45 **SYMPHONY: Environmentally Friendly Multisource Energy Harvesters
Relying on Novel Materials and Integration Concepts** **A.01.02**

J. Groten, O. Werzer, K. Krawczyk, P. Sch  ffner, A. Alvarez, G. Domann, X.
Wang, C. Rusu, M. Shousha, T. Herndl, M. Moser, B. Stadlober

J. Groten, O. Werzer, K. Krawczyk, P. Sch  ffner, A. Alvarez, B. Stadlober:
JOANNEUM RESEARCH Forschungsgesellschaft mbH, Weiz, Austria, G.
Domann: Fraunhofer-Institut f  r Silicatiforschung ISC, W  rzburg,
Germany, X. Wang, C. Rusu: RISE Research Institutes of Sweden,
G  teborg, Sweden, M. Shousha: Wuerth Elektronik eiSos GmbH & Co. KG,
Garching, Germany, T. Herndl: Infineon Technologies Austria AG, Graz,
Austria, M. Moser: Eologix Sensor Technology GmbH, Graz, Austria

10:00 **Hybrid energy harvester based on perovskite solar cell and ZnO
piezoelectric nanogenerator** **A.01.03**

YUAN ZHANG, XUAN LI, JOE BRISCOE

School of Engineering and Material Science and Materials Research Institute,
Queen Mary University of London

10:15 **Plasma engineering of microstructured piezo    Triboelectric hybrid
nanogenerators for wide bandwidth vibration energy harvesting** **A.01.04**

Xabier García-Casas 1, Ali Ghaffarinehad 1, Francisco J. Aparicio 1,2, Javier Castillo-Seoane 1, Carmen López-Santos 1,2, Jorge Budagosky-Marcilla 1, Jorge Gil-Rostra 1, Juan Ramón Sánchez-Valencia 1, Ángel Barranco 1, Ana Borrás 1

1. Nanotechnology on Surfaces and Plasma, Instituto de Ciencia de Materiales de Sevilla (Consejo Superior de Investigaciones Científicas "Universidad de Sevilla), Sevilla, Spain 2. Departamento de Física Aplicada I, Universidad de Sevilla, Sevilla, Spain

10:30 **Coffee break**

Triboelectric Generators : Ana Borrás

11:00 **Single Active Material Comprised TENG: A Novel Strategy in Self-Powered Wearable Sensors** **A.02.01**
Dipankar Mandal

Quantum Materials and Devices Unit, Institute of Nano Science and Technology, Knowledge City, Sector 81, Mohali, 140306, India

11:15 **Sustainable Digitalization with Endless Power** **A.02.02**
Suman Nandy^{1*}, Sumita Goswami², Guilherme Ferreira¹, Elvira Fortunato¹, Rodrigo Martins¹

1. CENIMAT/i3N, Department of Materials Science, NOVA School of Science and Technology, NOVA University Lisbon (FCT-NOVA) and CEMOP/UNINOVA, Campus de Caparica, 2829-516 Caparica, Portugal 2. Almascience, Campus da Caparica, 2829-516 Caparica, Almada, Portugal Email: s.nandy@fct.unl.pt

11:30 **Co-doping of aluminum and zirconium in HfO₂ thin films for pyroelectric energy harvesters** **A.02.03**
M. Neuber, A. Viegas*, M. Lederer, K. Köhnel, M. Czernohorsky

Fraunhofer IPMS, Center Nanoelectronic Technologies, An der Bartlake 5, 01109 Dresden, Germany e-mail: markus.neuber@ipms.fraunhofer.de

11:45 **Synthesis of bismuth composite-based hybrid metamaterials for discrete energy harvesting** **A.02.04**

Sontyana Adonijah Graham, Mandar Vasant Paranjape, Anand Kurakula, Jae Su Yu*

Department of Electronics and Information Convergence Engineering. Kyung Hee University. 1732 Deogyong-daero, Giheung-gu, Yongin-Si, Gyeonggi-do 17104, Republic of Korea

12:00 **Fabrication of Sr doped BaTiO₃-based hybrid nanogenerator for floor mechanical energy harvesting** **A.02.05**

Mandar Vasant Paranjape, Sontyana Adonijah Graham, Anand Kurakula, Jae Su Yu*

Department of Electronics and Information Convergence Engineering, Institute for Wearable Convergence Electronics, Kyung Hee University, 1732 Deogyong-daero, Giheung-gu, Yongin-Si, Gyeonggi-do 17104, Republic of Korea

12:30 **Lunch**

TEG : Mariona Coll

14:00 **Materials-related Strategies for Highly Efficient Triboelectric Energy Generators** **A.03.01**

Sohini Kar-Narayan

Department of Materials Science & Metallurgy, University of Cambridge, UK

14:30 **Triboelectric energy harvesting in harsh conditions: Temperature and pressure effects in methane and crude oil environments** **A.03.03**

C. Rodrigues¹, M. Kumar^{1,2}, M. P. Proença^{1,3}, R. Melo⁴, J. M. Salazar⁴, A. Pereira¹ and J. Ventura¹

¹IFIMUP and IN - Institute of Nanoscience and Nanotechnology and Department of Physics and Astronomy, Faculty of Sciences, University of Porto, Porto, Portugal, ²Organisation for Science Innovations and Research, Bah-283104 India, ³Instituto de Sistemas Optoelectrónicos y Microtecnología (ISOM), Universidad Politécnica de Madrid, Avda. Complutense 30, 28040 Madrid, Spain, ⁴Repsol S/A " Technology Lab / Upstream, Madrid, Spain.

14:45 **Triboelectric Pixels for large area integration of drop energy harvesters** **A.03.04**

Ali Ghaffarinejad,+1 Xabier Garc  a-Casas,+1 Fernando N    ez-G  lvez,1,2 Carmen L  pez-Santos,1,2 Juan Ram  n S  nchez-Valencia,1   ngel Barranco,1 Ana Borr  s1*

1) Nanotechnology on Surfaces and Plasma Laboratory, Consejo Superior de Investigaciones Cient  ficas (CSIC), Materials Science Institute of Seville (CSIC-US). c/ Am  rico Vespucio 49, 41092, Seville (Spain) 2) Departamento de F  sica Aplicada I, Universidad de Sevilla, C/ Virgen de Africa 7, 41011, Seville (Spain)

- 15:00 **Metal organic framework based triboelectric energy harvesting and self-powered robotics applications** **A.03.05**
Sugato Hajra, Hoe Joon Kim

Department of Robotics and Mechatronics Engineering, Daegu Gyeongbuk Institute of Science and Technology, Daegu-42988, South Korea

- 15:30 **Coffee Break**

Triboelectric Nanogenerators III : Mariona Coll

- 16:00 **Direct Current Contact-Mode Triboelectric Nanogenerators with Enhanced Power Generation** **A.04.01**
R. D. I. G. Dharmasena

Wolfson School of Mechanical, Electrical and Manufacturing Engineering, Loughborough University, Loughborough, LE11 3NR, United Kingdom

- 16:15 **Rotationally-driven piezoelectricity for energy harvesting: Computational study of plastic ionic molecular crystals** **A.04.02**
Elin Dypvik S  dahl, Julian Walker, Kristian Berland

Department of Mechanical Engineering and Technology Management, Norwegian University of Life Sciences, Norway, Department of Materials Science and Engineering NTNU, Norwegian University of Science and Technology, Department of Mechanical Engineering and Technology Management, Norwegian University of Life Sciences, Norway,

- 16:30 **Negative Field Induced Dipole Alignment and Crystallinity in Piezoelectric Polymers: An Effective Way to Enhance Piezoresponse** **A.04.03**
Anand Babu and Dipankar Mandal

Quantum Materials and Devices Unit, Institute of Nano Science and Technology, Knowledge City, Sector 81, Mohali, 140306, India

16:45 **PEDOT:PSS/CuSCN/ZnO-based piezoelectric smart devices for energy harvesting** **A.04.04**
Qinrong He, Han Zhang, Joe Briscoe*

School of Engineering and Material Science and Materials Research Institute,
Queen Mary University of London, London, E1 4NS

17:00 **Strategies for enhanced polymer contact electrification and mechanical energy harvesting** **A.04.05**
Andris Ļutka,¹ Linards LapāĶinskis,¹ Kaspars MāĶinieks,¹ Artis Linarts,² Osvalds Vērnis¹

1. Institute of Materials and Surface Engineering, Faculty of Materials Science and Applied Chemistry, Riga Technical University 2. Institute of Technical Physics, Faculty of Materials Science and Applied Chemistry, Riga Technical University

17:15 **High efficiency water splitting using ultrasound coupled BaTiO₃ nanoparticles** **A.04.06**
Yan Zhang, Steve Dunn, Hamideh Khanbareh, Chris R Bowen, Nguyen Phuc Hoang Duy, Pham Thi Thuy Phuong

Yan Zhang¹, Steve Dunn², Hamideh Khanbareh³, Chris R Bowen³, Nguyen Phuc Hoang Duy⁴, Pham Thi Thuy Phuong⁴ 1 ~ State Key Laboratory of Powder Metallurgy, Central South University, Changsha, 410083, Hunan, China 2 ~ Chemical and Energy Engineering, London South Bank University, London, SE1 0AA 3 ~ Department of Mechanical Engineering, University of Bath, Claverton Down, Bath, BA2 7AY, UK 4 ~ Institute of Chemical Technology, Viet Nam Academy of Science and Technology, Ho Chi Minh, Vietnam

Poster session Symp A : Ana Borrás, Joe Briscoe, Anjana Devi

17:30 **Asymmetrically Charged High-Output Triboelectric Nanogenerators** **A.P.1**
R. D. I. G. Dharmasena

Wolfson School of Mechanical, Electrical and Manufacturing Engineering,
Loughborough University, Loughborough, LE11 3NR, United Kingdom

17:30 **Low frequency vibrational energy harvesting with fully printed multi- and single stack P(VDF-TrFE) transducers** **A.P.2**
A. Alvarez, A. Petritz, P. Schöffner, M. Beleggratis, M. Adler, J. Groten, B. Stadlober

- High performance of Flow-Capacitive Mixing power generation of N-Doped Activated Carbon derived from Melamine** **A.P.3**
17:30
Donghyun Kim, Bong-Gu Kim, Haeun Kim, Haeun Seo, Dong Gyeong Kim, Hyeryang Choi, Junseong Kim, SeungCheol Yang
Department of Materials Convergence and System Engineering, Changwon National University
- Enhanced thermoelectric properties by anion-engineering of 2-dimensional transition metal dichalcogenides** **A.P.4**
17:30
Ki Chang Kwon, Hosun Shin
Korea Research Institute of Standards and Science (KRISS)
- Additive-free spin coating of tin oxide thin films using a new tin precursor** **A.P.5**
17:30
Niklas Huster, David Zanders, Detlef Rogalla, Anjana Devi

Inorganic Materials Chemistry, Faculty of Chemistry and Biochemistry, Ruhr University Bochum, 44801 Bochum, Germany, RUBION, Ruhr University Bochum, 44801 Bochum, Germany
- Influence of Radiofrequency Power on the properties of Cu₃N films deposited by magnetron sputtering in a pure nitrogen atmosphere** **A.P.6**
17:30
M.I Rodr guez-Tapiador¹, J. Merino², T. Jawhari³, A.L Rosales⁴, J.Bertomeu⁴, S. Fern ndez¹

¹Energy Department, CIEMAT, Av. Complutense 40, Madrid 28040, Spain.
²University Rey Juan Carlos, Technology Support Center CAT, Tulip n, s/n, M stoles 28039, Madrid, Spain ³Unitat d'espectrosc pia, Raman Centres Cient fics i Tecnol gics de la Universitat de Barcelona   CCiTUB, Llu s Sol  i Sabaris, 1-3 08028 Barcelona, Spain ⁴Departament de F sica Aplicada, Universitat de Barcelona, Barcelona, Spain
- MBE-grown GaAs on a low-cost Si substrate for solar hydrogen production** **A.P.7**
17:30
Le Hanh Vi (1), Mekan Piriye (1), Gabriel Loget (2), Bruno Fabre (2), Tony Rohel (1), Antoine L toublon (1), Christophe Levallois (1), Karine Tavernier (1), Yoan L ger (1), Nicolas Bertru (1), Charles Cornet (1)

1. Univ Rennes, INSA Rennes, CNRS, Institut FOTON-UMR 6082, F-35000, Rennes, France. 2. Univ Rennes, CNRS, ISCR (Institut des Sciences Chimiques de Rennes)-UMR6226, Rennes F-35000, France.

- 17:30 Tuning of Morphological, Crystallographic and Optoelectronic Properties in Electrodeposition of CuSCN for Device Applications A.P.8**
- Kyota Uda¹, Tensho Nakamura¹, Yuki Tsuda², Lina Sun³, Yoshiyuki Suzuri³, Masatoshi Yanagida⁴, Tsukasa Yoshida¹
- ¹ Graduate School of Science and Engineering, Yamagata University, Yonezawa, Yamagata, Japan ²National Institute of Advanced Industrial Science and Technology (AIST), Osaka, Japan ³ Innovation Center for Organic Electronics (INOEL), Yamagata University, Yonezawa, Yamagata, Japan ⁴ National Institute for Materials Science (NIMS), Tsukuba, Ibaraki, Japan
- 17:30 Towards all-oxide flexible devices for photovoltaics A.P.9**
- Pamela Machado, Pol Salles, Mariona Coll
- ICMAB-CSIC
- 17:30 Development of Post Treatment Methods on Silver Nanowire Networks for Transparent Triboelectric Nanogenerator Sensors A.P.10**
- Onuralp Cakir¹, Doga Doganay¹, Melih Ogeday Cicek¹, Sahin Coskun², Ozge Demirtas³, Alpan Bek^{3,4}, Husnu Emrah Unalan¹
- ¹. Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800, Ankara, TURKEY, ². Department of Metallurgical and Materials Engineering, Eskisehir Osmangazi University (ESOGU), 26040, Eskişehir, TURKEY, ³. Micro and Nanotechnology Program, Middle East Technical University (METU), 06800, Ankara, TURKEY, ⁴. Department of Physics, Middle East Technical University (METU), 06800, Ankara, TURKEY.
- 17:30 Triboelectric Nanogenerators for Blue Energy Harvesting with Floating Buoy Systems A.P.11**
- Onur Demircioglu, Melih Ogeday Cicek, Doga Doganay, G  lnay Gazaloglu, Ahmet Cevdet Yalciner, Husnu Emrah Unalan

Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800, Ankara, TURKEY, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800, Ankara, TURKEY, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800, Ankara, TURKEY, Department of Civil Engineering, Middle East Technical University (METU), 06800, Ankara, TURKEY, Department of Civil Engineering, Middle East Technical University (METU), 06800, Ankara, TURKEY, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800, Ankara, TURKEY, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey

17:30 **Modifying thermoelectric properties of Sb₂Te₃-AgSbTe₂ nanocomposite thin film through carrier filtering and band engineering** **A.P.12**

Abhishek Ghosh*, Prashant Bisht, Narinder Kaur, Chandan K Vishwakarma, Mujeeb Ahmad, Per Erik Vullum, Branson D.Belleb, Bodh Raj Mehta

Department of Physics, Indian Institute of Technology Delhi, New Delhi, 110016, India

17:30 **Investigating the growth of antimony sulfide thin films for solar cell applications** **A.P.13**

*Atanas Katerski, Robert Beglaryan, Ilona Oja Acik, Malle Krunk
*presenting author

Laboratory of Thin Film Chemical Technologies, Department of Materials and Environmental Technology, Tallinn University of Technology, Estonia

17:30 **Enhanced aerosol-assisted crystallisation of phase-stable FAPbI₃ perovskite for photovoltaics using MASCN additives** **A.P.14**

Madsar Hameed, Oliver Jelley, Lokeshwari Mohan, Joe Briscoe
Queen Mary University of London

17:30 **Solution-processed nanocomposites for high-performance hygroelectric generators** **A.P.15**

Byeong-Cheol Kang, Sang-Joon Park, and Tae-Jun Ha*

Department of Electronic Materials Engineering, Kwangwoon University, Seoul 01897, Korea

17:30 **Redox-active Porous Polymers: Synthesis and Applications** **A.P.16**

Safa Ali Al Siyabi Charl F. J. Faul

- 17:30 **Multi-scale Designed CoMn_3O_4 Spinel: Smart Pre-Catalysts towards High-Efficiency Upcycling of Waste Plastics** **A.P.17**
- Xingmin Liu^{1,a}, Dan Xu^{2,a}, Hui Ding¹, Marc Widenmeyer¹, Wenjie Xie¹, Maximilian Mellin¹, Fangmu Qu¹, Guoxing Chen³, Ye Shui Zhang^{2,4}, Zhenyu Zhang², Aasir Rashid¹, Leopoldo Molina-Luna¹, Dan J. L. Brett², Ralf Riedel¹, Anke Weidenkaff¹
- 1 Institute of Materials Science, Technische Universität Darmstadt, Alarich-Weiss-Str. 2, 64287, Darmstadt, Germany 2 Electrochemical Innovation Lab, Department of Chemical Engineering, University College London, London WC1E 7JE, UK 3 Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKS, Brentanostraße 2a, 63755 Alzenau, Germany 4 School of Engineering, University of Aberdeen, Aberdeen, AB24 3UE, UK
- 17:30 **The effect of chamber pressure under different atmospheres of CuO -thin films for potential photovoltaic applications** **A.P.18**
- A.L. Muñoz-Rosas^{1,2}, J.M. Asensi^{1,2}, J. López-Vidrier^{1,2}, J.M. Asensi^{1,2}, T. Tom^{1,2}, J. Bertomeu^{1,2}
- 1 Departament de Física Aplicada, Universitat de Barcelona, Barcelona, Spain 2 Institute of Nanoscience and Nanotechnology (IN2UB), Universitat de Barcelona, Barcelona, Spain
- 17:30 **Interfacial Patterning to Create High ZT Thermoelectric Materials** **A.P.19**
- Shane Graham Davies, Steven Paul Hepplestone
University of Exeter
- 17:30 **Photo-Seebeck effect assisted photocurrent switching in bismuth telluride topological insulator** **A.P.20**
- Anand Nivedan, Sunil Kumar
- Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India
- 17:30 **Hybrid organometallic structure combining photo-thermo-electric properties and the effect of supercapacitor** **A.P.21**
- Oleksii Smirnov, Rada Savkina
- V. Lashkaryov Institute of Semiconductors Physics, NAS of Ukraine, Nauky av.41, 03028 Kyiv, Ukraine

17:30 **Reduced Singlet-Triplet Annihilation for Low Threshold Amplified Spontaneous Emission from Blue Polyfluorene Electroluminescent Organic Semiconductor** **A.P.22**
 Gopa Sadar
 India

17:30 **Role of Monovalent Cation in the Dielectric Relaxation Processes and Correlation of Defects with the Thermal Stability of Hybrid** **A.P.23**
 Kashimul Hossain, Shivam Singh*, Dinesh Kabra*
 Department of Physics, Indian Institute of Technology Bombay, Mumbai, India 400076

17:30 **Investigation of charge carrier mobility and disorder parameters in cross-linkable hole transporting materials** **A.P.24**
 Romualdas Jonas Č,epas*(1), Egidijus Kamarauskas (1), Kristijonas Genevič,ius (1), Aistė, Jegorovė, (2)

(1) Institute of Chemical Physics, Vilnius University, Saulė,tekio al. 3, Vilnius 10257, Lithuania (2) Department of Organic Chemistry, Kaunas University of Technology, Radvilenu pl. 19, Kaunas 50254, Lithuania

TUESDAY, 20 SEPTEMBER 2022

Light harvesting : Joe Briscoe

9:00 **Zombie Solar Cells for Ambient Applications** **A.05.01**
 Marina Freitag

School of Natural and Enviromental Sciences, Newcastle University

9:30 **Lattice mode symmetries and origin of anharmonicity in methylammonium lead iodide** **A.05.02**
 Rituraj Sharma, Matan Menahem, Zhenbang Dai, Lingyuan Gao, Roman Korobko, Omer Yaffe and Andrew Rappe

Department of Chemical and Biological Physics, Weizmann Institute of Science, Rehovot, Israel, Department of Chemistry, University of Pennsylvania, Philadelphia, USA

9:45 **Amine-Based Passivating Material for Improved Performance of CsPbI2Br based Perovskite Solar Cells** **A.05.03**

Kalsoom Fatima, Zareen Akhter, Muhammad Sultan, Lukas Schmidt- Mende, Joe Briscoe

Kalsoom Fatima 1,4, Zareen Akhter 1, Muhammad Sultan 2, Lukas Schmidt-Mende 3, Joe Briscoe 4 1. Department of Chemistry, Quaid-i-Azam University, 45320 Islamabad, Pakistan 2. Department of Physics, Kohsar University Murree, 47150 Punjab, Pakistan 3. Department of Physics, University of Konstanz, D-78457, Konstanz, Germany 4. School of Engineering and Materials Science, Queen Mary University of London, UK.

10:00 **New substituted small A cation(Acetamidinium) based Tin perovskite solar cell** **A.05.04**

Soumen Kundu , Sushobhan Avasthi

Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore, Karnataka 560012, India

10:15 **Structural and optical study of inorganic halide perovskite nanocrystals for LED applications** **A.05.05**

Atif Suhail, Gunadeep Teron, Monojit Bag

Advanced Research in Electrochemical Impedance Spectroscopy Laboratory, Indian Institute of Technology Roorkee, Roorkee 247667, India

10:30 **coffee break**

11:00 **Bismuth based Panchromatic Solar Light Absorber Complexes** **A.06.01**

Harsh Bhatia, Christopher Savory, David Scanlon, Robert Palgrave, Bob C. Schroeder

University College London

11:15 **Fully atomic layer deposited transparent selective contacts based on transition metal oxides and interfacial dipole for CZTSe SC** **A.06.02**

Benjam n Pusay, Rosa Almache-Hern ndez, Kunal Tiwari, Eloi Ros, Alex Jimenez, Gerard Mastmitja, Isidro Mart n, Crist bal Voz, Joaquim Puigdollers, Edgardo Saucedo, Pablo Ortega

Departament d'Enginyeria Electr nica, Universitat Polit cnica de Catalunya, Barcelona, Spain, Catalonia Institute for Energy (IREC), Barcelona, Spain

11:30 **SEMI-TRANSPARENT Sb₂S₃ SOLAR CELLS WITH FLUORENE-BASED ENAMINE AS HOLE TRANSPORT MATERIALS** **A.06.03**

Juneja, N. (1), Mandati, S. (1), Katerski, A. (1), Spalatu, N. (1),
 Daskeviciute-Geguziene, S. (2), Vembris, A. (3), Getautis, V. (2),
 Karazhanov, S. (4), Krunks, M. (1), and Oja Acik, I. (1)

1. Laboratory of Thin Film Chemical Technologies, TalTech, 19086 Tallinn, Estonia
 2. Department of Organic Chemistry, Kaunas University of Technology, 50254 Kaunas, Lithuania
 3. Institute of Solid State Physics, University of Latvia, Kengaraga Str. 8, Riga, Latvia
 4. Institute for Energy Technology (IFE), P.O Box 40, NO 2027, Kjeller, Norway.

11:45 **1D nanostructured electrodes in dye-sensitized solar cells for indoor light harvesting** **A.06.04**

Lidia Contreras-Bernal, Javier Castillo-Seoane, Jorge Gil-Rostra, Juan Antonio Anta, Ángel Barranco, Juan Ramón Sáñchez-Valencia, Ana Borrás
 Institute of Materials Science of Seville, (Spanish National Research Council (CSIC) – Univ. Seville), Seville, Spain: Lidia Contreras-Bernal, Javier Castillo-Seoane, Jorge Gil-Rostra, Ángel Barranco, Juan Ramón Sáñchez-Valencia, Ana Borrás. Department of Physical, Chemical and Natural Systems, (Univ. Pablo de Olavide), Sevilla, Spain: Juan Antonio Anta

12:00 **On the interaction of Mn-related centres with the centres of photosensitivity in ZnO ceramics** **A.06.06**

I.Markevich1), N.Korsunsk1), N.Stara1), I.Vorona1), O.Melnichuk2), L.Khomenkova1,3)

1) V. Lashkaryov Institute of Semiconductor Physics, 45 Pr.Nauky, 03028 Kyiv, Ukraine, 2) Nizhyn Gogol State University, 2 Graftska str., 16600 Nizhyn, Ukraine, 3) National University of Kyiv-Mohyla Academy, 2 Skovorody str., 04070 Kyiv, Ukraine.

12:15 **New Spectrally Selective Coatings for CSP Linear Receivers Operating in Air at High Temperature** **A.06.08**

Gabriella Rossi, Antonio D'Angelo, Claudia Diletto, Salvatore Esposito, Antonio Guglielmo, Michela Lanchi

ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development - Department for Energy Technologies and Renewable Energy Sources

13:00 **Lunch Break**

Self-powered devices and Thermoelectric materials : Mariona Coll

14:00 **Micro/nano-engineered, self-powered physical/chemical sensors for smart IoT** **A.06.01**

Inkyu Park

KAIST Endowed Chair Professor of Mechanical Engineering, KAIST, South Korea

14:30 **Phonon-Plasmon Coupling in Thermoelectric Cu₂-xTe Using Raman Spectroscopy** **A.06.02**

Divya Rawat, Juhi Pandey, Shriparna Mukherjee, Ramesh Chandra Malik, and Ajay Soni*

School of Basic Sciences, Indian Institute of Technology Mandi, Mandi 175075, India, School of Basic Sciences, Indian Institute of Technology Mandi, Mandi 175075, India, Interdisciplinary Center for Energy Research, Indian Institute of Science, Bangalore 560012, India, Thermoelectric Materials and Device Laboratory, Department of Physics, Indian Institute of Science, Bangalore 560012, India.

14:45 **Ionic thermoelectric effect in nanofluidic membranes for efficient conversion of waste heat into electrical energy** **A.06.03**

Ievgen Nedrygailov, Kamil Rahme, Scott Monaghan, Anjali Ashokan, Rupa Ranjani, Paul Hurley, Subhajit Biswas, Justin D. Holmes

School of Chemistry & Tyndall National Institute, University College Cork, Cork, Ireland, AMBER Centre, Environmental Research Institute, University College Cork, Ireland

15:00 **Adaptable Silicon-Alloy and Silicide nanostructured Thermoelectric Fibers for Energy Harvesting** **A.06.04**

Carolina Duque Sierra[1], Jose Manuel Sojo Gordillo[1], Merce Pacios, Alex Morata[1], Albert Tarancón[1][2].

[1] Catalonia Institute for Energy Research (IREC), Jardins de Les Dones de Negre 1, Sant Adrià de Besòs, Barcelona, Spain [2] Catalan Institution for Research and Advanced Studies (ICREA), Passeig Lluís Companys 23, Barcelona, Spain

15:15 **Interface effects on electron and phonon transport and large enhancement in thermoelectric properties in Sb₂Te₃/MoS₂ multilayer** **A.06.05**

Mujeeb Ahmad, Khushboo Agarwal, Sergio Gonzalez Munoz, Abhishek Ghosh, O.V. Kolosov* and B.R. Mehta*

International Research Centre MagTop, Institute of Physics, Polish Academy of Science, Aleja Lotnikow 32/46, PL-02668 Warsaw, Poland

- 16:00 **A novel low-grade thermal energy harvesting technology using hybridized triboelectric and thermomagnetic effects** **A.06.06**
C. Rodrigues¹, A. Pires¹, I. Gonçalves¹, D. Silva¹, J. Oliveira², A. Pereira¹ and J. Ventura¹

1IFIMUP and Department of Physics and Astronomy, Faculty of Sciences of the University of Porto, Rua do Campo Alegre, 678, Porto 4169-007, Portugal, 2LAETA/INEGI and Department of Engineering Physics of Faculty of Engineering of the University of Porto, Rua Dr. Roberto Frias s/n, Porto 4200-465, Portugal.
- 16:15 **Flexible thermoelectric thin films based on layered nanoporous Ca₃Co₄O₉** **A.06.07**
Binbin Xin, Arnaud Le Febvrier, Lei Wang, Niclas Solin, Biplab Paul and Per Eklund

Binbin Xin, Arnaud Le Febvrier, and Per Eklund: Thin Film Physics Division, Department of Physics, Chemistry and Biology (IFM), Linköping University, SE-58183 Linköping, Sweden, Lei Wang, and Niclas Solin: Electronic and Photonic Materials Division, Department of Physics, Chemistry and Biology (IFM), Linköping University, SE-58183 Linköping, Sweden, Biplab Paul: Platit AG, Selzach, Switzerland
- 16:30 **Silicon-based TEM grids for the complete thermoelectrical characterization of individual nanowires** **A.06.08**
Jose Manuel Sojo Gordillo^[1], Carolina Duque Sierra^[1], Nerea Alayo^[1], Marc Salleras^[2], Denise Estrada^[2], Luis Fonseca^[2], Alex Morata^[2], Albert Tarancón^[2,3].

[1] Catalonia Institute for Energy Research (IREC), Jardins de Les Dones de Negre 1, 08930, Sant Adrià de Besòs, Barcelona, Spain [2] Institute of Microelectronics of Barcelona, IMB-CNM (CSIC), C/Tilàs s/n (Campus UAB), 08193, Bellaterra, Barcelona, Spain [3] Catalan Institution for Research and Advanced Studies (ICREA), Passeig Lluís Companys 23, 08010, Barcelona, Spain
- 16:45 **Harvesting energy with carbon nanostructures** **A.06.09**
Dawid Janas

Silesian University of Technology, Department of Organic Chemistry,
Bioorganic Chemistry and Biotechnology, Krzywoustego 4, 44-100 Gliwice

- 17:00 **3D printing of free-standing carbon fiber-reinforced shape memory polymer composites via frontal polymerization** **A.06.10**
Hyeon-Ju Jang and Woong-Ryeol Yu

Department of Materials Science and Engineering, Seoul National University,
599 Gwanak-ro, Gwanak-gu, Seoul 151-742, Republic of Korea

- 17:15 **Graphene reinforced thermoplastic polymers for automotive applications** **A.06.11**
Cosimo Anichini,¹ Sanjay B. Thorat,¹ Stefano Bortolotti,¹ and Francesco Bonaccorso^{1,2}

1. BeDimensional S.p.A., Via Lungotorrente Secca 30R, 16163 Genova, Italy
2. Istituto Italiano di Tecnologia, via Morego 30, 16163 Genova, Italy

WEDNESDAY, 21 SEPTEMBER 2022

Processing of materials for electronics and energy : Anjana Devi

- 14:00 **Atomic layer deposition for emerging energy scavenging technologies in low-power electronics** **A.08.01**
Mari Napari

School of Electronics and Computer Science, University of Southampton,
United Kingdom

- 14:30 **Hybrid ALD-CVD processing of tailored nanocomposite coatings for energy applications** **A.08.02**
Naoufal BAHLOWANE

Luxembourg Institute of Science and Technology (LIST) Materials Research
and Technology Department 28, Avenue des hauts-Fourneaux , L-4362
Esch-sur-Alzette , Luxembourg

- 15:00 **Interface engineering of ZnO thin films by remote plasma-assisted vacuum deposition for the solvent-less fabrication of piezoele** **A.08.03**

Xabier Garc  a-Casas¹, Gloria P. Moreno¹, Francisco J. Aparicio^{1,2*}, Qinrong He³, Ali Ghaffarinejad¹, Juan R. Sanchez-Valencia¹, Joe Briscoe³, Angel Barranco¹, Ana Borr  s¹.

1. Nanotechnology on Surfaces and Plasma Group (CSIC-US), Materials Science Institute of Seville (Consejo Superior de Investigaciones Científicas - Universidad de Sevilla), c/Americo Vespucio 49, 41092 Seville, Spain 2. Departamento de Física Aplicada I, Escuela Politécnica Superior, Universidad de Sevilla, c/ Virgen de África 7, E-41011 Seville. 3. School of Engineering and Material Science and Materials Research Institute, Queen Mary University of London, E1 4NS, London. *presenting author.

15:15 **Electrohydrodynamic 3D printing of silk microfibers for electronics miniaturization.** **A.08.04**

Ander Reizabal, Paula González, Senentxu Lanceros-Mendez, Paul Dalton Phil and Penny Knight Campus for Accelerating Scientific Impact, University of Oregon, 1505 Franklin Boulevard, Eugene 97403, OR, USA BCMaterials, Basque Center for Materials, Applications and Nanostructures, Bldg. Martina Casiano, UPV/EHU Science Park, Barrio Sarriena s/n, 48940 Leioa, Spain Macromolecular Chemistry Research Group (LABQUIMAC), Dept. of Physical Chemistry. Faculty of Science and Technology, University of the Basque Country (UPV/EHU), Spain

16:00 **Photochemical Room Temperature Solution Processing of Functional Thin Films** **A.08.05**

Lina Sun, Tatsuki Sasaki, Tsukasa Yoshida, Yoshiyuki Suzuri

Innovation Center for Organic Electronics (INOEL), Graduate School of Science and Engineering, Yamagata University, Japan

16:15 **In-situ analysis of solvent extraction process for large area perovskite film formation** **A.07.06**

Xuan Li, Stoichko Dimitrov

School of Physical and Chemical Sciences, Queen Mary University of London

16:30 **Synthesis of palladium nanoparticles using colloidal approach** **A.07.07**

Ivan Saldan, Martina Láňková, David Pavlíček, Jan M. Macák

Central European Institute of Technology, Brno University of Technology, Purkyňova 123, 61200 Brno, Czech Republic Center of Materials and Nanotechnologies, Faculty of Chemical Technology, University of Pardubice, Nam. Cs. Legii 565, 530 02 Pardubice, Czech Republic

16:45 **Fabrication of shear stiffening film using phase separation process** **A.07.08**
 Solbin Yun, Yeonsong Kim, and Woong-Ryeol Yu

Department of Materials Science and Engineering and Research Institute of
 Advanced Materials (RIAM), Seoul National University, 1 Gwanak-ro,
 Gwanak-gu, Seoul 151-744, Republic of KOREA

17:00 **Exploring electrostatic interactions of flat metal nanoparticles at the
 air-water interface** **A.07.09**

Pumza Mente, Rafał, Zbonikowski, Jan Paczesny
 Institute of Physical Chemistry, Polish Academy of Science

17:15 **Aerosol Printed Asymmetric Coupled Stripline (ACS) fed Microstrip
 Antenna for Biomedical Applications** **A.07.10**

Sanjee Lamsal¹, Joao Garretto¹, Srikanth Itapu^{2*}, Frank X. Li¹, Pedro
 Cortes³, Vamsi Borra¹

¹ Electrical and Computer Engineering, Youngstown State University, Ohio,
 USA ^{2*} Department of Electronics and Communication Engineering, Alliance
 University, Karnataka, India ³ Chemical Engineering, Youngstown State
 University, Ohio, USA

THURSDAY, 22 SEPTEMBER 2022

Fabrication and characterization of materials : Anjana Devi, Joe Briscoe

9:15 **THERMO-MECHANICAL PROPERTIES OF GRAPHENE BASED POLYMER
 NANOCOMPOSITES : FABRICATION, PROPERTIES AND
 APPLICATIONS** **A.09.01**

Santosh K. Tiwari
 Faculty of Chemistry , University of Warsaw, Poland

9:30 **Silver nanowire based transparent and flexible force sensors** **A.09.02**
 Nagasarvari Garikapati and P. Swaminathan

Garikapati Nagasarvari ¹, P. Swaminathan ^{1, 2} ¹ Electronic Materials and
 Thin Films Lab, Department of Metallurgical and Materials Engineering, IIT
 Madras, Chennai, India ² Ceramics Technologies Group-Centre of Excellence
 in Materials and Manufacturing for Futuristic Mobility, IIT Madras, Chennai,
 India

9:45 **Low-Energy-Consumption and Electret-Free Photosynaptic Transistor Utilizing Poly(3-hexylthiophene)-Based Conjugated Block Copoly** **A.09.03**

Wei-Chen Yang, Yan-Cheng Lin, Shin Inagaki, Hiroya Shimizu, Ender Ercan, Li-Che Hsu, Chu-Chen Chueh, Tomoya Higashihara,* and Wen-Chang Chen*

National Taiwan University-Department of Chemical Engineering (Taiwan)
Wei-Chen Yang, Yan-Cheng Lin, Ender Ercan, Li-Che Hsu, Chu-Chen Chueh, Wen-Chang Chen* Yamagata University-Department of Organic Materials Science Graduate School of Organic Materials Science (Japan) Shin Inagaki, Hiroya Shimizu, Tomoya Higashihara*

10:00 **XRR measurements of pentacene thin film** **A.09.04**

Abhirup Das¹, Samik Mallik², Prof. D. K. Goswami^{1,2}

¹Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur 721302, India ²School of Nanoscience and Technology, Indian Institute of Technology Kharagpur, Kharagpur 721302, India

10:15 **Surface roughness driven contact electrification between chemically identical polymers** **A.09.05**

Osvalds Verners (1), Linards Lapāčinskis (2), Lāva Ārmane (2), Aarne Kasikov (3), Martin Timusk (3), Amanda V. Ellis (4), Peter C. Sherrell (4), Andris Lūtkā (1)

¹ Institute of Materials and Surface Engineering, Faculty of Materials Science and Applied Chemistry, Riga Technical University, ² Institute of Technical Physics, Faculty of Materials Science and Applied Chemistry, Riga Technical University, ³ Laboratory of Low Temperatures Structure, University of Tartu, ⁴ Department of Chemical Engineering, The University of Melbourne



Symposium C

Sessions: Room 103| MINI Building

Poster Session: Small Hall| Main Building

Functional materials:

From predictive modelling to machine learning as versatile tools for materials design

Symposium Organizers:

Elena LEVCHENKO University of Newcastle Australia

Guido ORI Institut de Physique et Chimie des Matériaux de Strasbourg France

Michał HERMANOWICZ University of Warsaw Poland

Yannick J. DAPPE Service de Physique de l'Etat Condensé (SPEC – CNRS – CEA Saclay) France

Symposium C Program

MONDAY, 19 SEPTEMBER 2022

8:30

Welcome message and introduction to the Symposium

Predicting materials properties by first-principles and machine learning modeling - I : Elena Levchenko

8:45

Machine Learning for Screening Large Organic Molecules

C.01.01

Christopher Gaul, Santiago Cuesta-Lopez
Fundación ICAMCYL, International Center for Advanced Materials and Raw
Materials of Castilla y León, León, Spain

9:15

Optimum design of composite pressure vessels using artificial intelligence

C.01.02

Doyoung kim, Kyeong-Mo Kang and Woong-Ryeol Yu
Department of Materials Science and Engineering, Seoul National University,
599 Gwanak-ro, Gwanak-gu, Seoul 151-742, Republic of Korea

9:30

Machine Learning for the edge energies of high symmetry Au nanoparticles

C.01.03

Emmanouil Pervolarakis, Georgios A. Tritsarlis, Phoebus Rosakis, Ioannis N. Remediakis
Department of Materials Science and Technology, University of Crete, Heraklion 70013, Greece, John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts 02138, United States of America, Department of Mathematics and Applied Mathematics, University of Crete, Heraklion 70013, Greece and Institute of Applied & Computational Mathematics, Foundation for Research and Technology Hellas, 71110 Heraklion, Crete, Greece, Department of Materials Science and Technology, University of Crete, Heraklion 70013, Greece and Institute of Electronic Structure and Laser, Foundation for Research and Technology Hellas, 71110 Heraklion, Crete, Greece,

9:45

First-principles and machine-learned interatomic potential molecular dynamics for GeSe₂ liquid and glass.

C.01.04

Steve Dave Wansi Wendji,* Carlo Massobrio,* Guido Ori*

*Institute of Physics and Chemistry of Materials of Strasbourg (IPCMS), UMR 7504 CNRS - University of Strasbourg, France.

10:00 **Artificial intelligence algorithm to simulate polymer matrix dehydration** **C.01.05**

S. Sansotta, R. Costa, and P. B. Coto

Materials Physics Center (CFM)-Spanish National Research Council (CSIC),
Chair of Biogenic Functional Materials, Technical University of Munich,
Materials Physics Center (CFM)-Spanish National Research Council (CSIC)

10:15 **Investigating electronic structures of Kagome metals** **C.01.06**

Farnaz Kaboudvand, Yuzki Oey, Samuel ML Teicher, Brenden Ortiz, Michelle D Johannes, Stephen D Wilson, Ram Seshadri

Materials Department, Materials Research Laboratory, and California
NanoSystems Institute, University of California, Santa Barbara, California
93106, USA, Center for Computational Materials Science, Naval Research
Laboratory, Washington, DC 20375, USA

10:15 **Investigating electronic structures of Kagome metals** **C.01.06**

Farnaz Kaboudvand, Yuzki Oey, Samuel ML Teicher, Brenden Ortiz, Michelle D Johannes, Stephen D Wilson, Ram Seshadri

Materials Department, Materials Research Laboratory, and California
NanoSystems Institute, University of California, Santa Barbara, California
93106, USA, Center for Computational Materials Science, Naval Research
Laboratory, Washington, DC 20375, USA

10:30 **Coffee break**

Predicting materials properties by first-principles and machine learning modeling - II : Michal Hermanowicz

11:00 **Materials and molecular dynamics: where do we stand?** **C.02.01**

Carlo Massobrio

Institut de Physique et Chimie des Matériaux de Strasbourg, 23 Rue du
Loess, BP 43, F-67034 Strasbourg, France
Carlo.Massobrio@ipcms.unistra.fr

11:30 **Swarm Smart meta-estimator for 2D/2D heterojunction design** **C.02.02**

Botella R., Kistanov A. A., Celis, J., Cao, W.
Funmaters group, NANOMO research unit, Oulu University, Pentti Kaiteran
katu 1, 90570 Oulu

11:45 **Thermal topological phase transition in SnTe from ab-initio calculations** **C.02.03**

Pablo Aguado-Puente, Piotr Chudzinski
CIC Nanogune BRTA, E-20018 Donostia - SanSebastian, Spain, Institute of
Fundamental Technological Research, Polish Academy of Sciences,
Pawinskiego 5B, 02-105 Warsaw, Poland

12:00 **First-principles and machine-learned potential molecular dynamics modelling of amorphous Ge₂Sb₂Te₅ systems: a quantitative asses** **C.02.04**

Mohammed GUERBOUB¹, Maouro BOERO¹, Evelyne MARTIN², Assil
BOUZID,³ Carlo MASSOBRIO¹, Guido ORI¹

¹ Université de Strasbourg, CNRS, Institut de Physique et Chimie des
Matériaux de Strasbourg, UMR 7504, F-67034 Strasbourg, France ²
Université de Strasbourg, CNRS, Laboratoire ICube, UMR 7357, F-67037
Strasbourg, France ³ Institut de Recherche sur les Céramiques (IRCER),
CNRS UMR 7315, Université de Limoges, Centre Européen de la
Céramique, 12 rue Atlantis, 87068 Limoges, France

12:15 **Second-principles modelling of ABO₃ perovskites with MULTIBINIT** **C.02.05**

Louis Bastogne, Philippe Ghosez
Theoretical Materials Physics, CESAM, Université de Liège, B-4000
Liège, Belgium

12:30 **Lunch break**

Material design, comprehension and application by atomistic modeling: 2d materials, films and alloys -I :
Guido Ori

14:00 **Correlating Emission Properties of Layered Perovskites through Molecular Descriptors** **C.03.01**

Balaji Dhanabalan, Elana Borvick, Seda Kutkan, Roman Krahne, Liberato Manna, Assaf Anderson, Milena P. Arciniegas

Balaji Dhanabalan, Seda Kutkan, Roman Krahne, Liberato Manna, and Milena P. Arciniegas from Istituto italiano di tecnologia, E. Borvick and Assaf Anderson: Materials Zone

14:30 **The limiting nature of periodic boundary conditions in DFT-based treatment of 2D vdW heterostructures.** **C.03.02**

Joran Celis, Andrey A. Kistanov, Romain Botella, Wei Cao
University of Oulu, Nano and Molecular Systems research unit (NANOMO),
Functional Materials research group

14:45 **Interface Engineering and morphological control of Lateral 2d Heterostructures** **C.03.03**

Francis H. Davies, A.V. Krashenninikov
Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and
Materials Research, 01328 Dresden, Germany, Helmholtz-Zentrum Dresden-
Rossendorf, Institute of Ion Beam Physics and Materials Research, 01328
Dresden, Germany

15:00 **A phase field model coupled with genetic algorithm to simulate ferroelectric switching in polycrystalline HZO thin film** **C.03.04**

Sandeep Sugathan, Krishnamohan Thekkepat, Soumya Bandyopadhyay,
Jiyoung Kim, and Pil-Ryung Cha.
Sandeep Sugathan, Soumya Bandyopadhyay, Pil-Ryung Cha, School of
Advanced Materials Engineering, Kookmin University, Seoul 02707, Korea.
Krishnamohan Thekkepat, Electronic Materials Research Center, Korea
Institute of Science and Technology, Seoul 02792, Republic of Korea.
Jiyoung Kim, Department of Materials Science and Engineering, The
University of Texas at Dallas, Texas 75080, USA.

15:15 **First Principle Thermodynamic Modelling of Transition Metal Dichalcogenide Growth** **C.03.05**

E. Marques, V. Voronenkov, B. Van Troeye, M.J. van Setten, P. Morin, B.
Groven, S. De Gendt, I. Asselberghs, G. Pourtois

Department of Chemistry, University of Leuven, B-3001 Leuven, Belgium,
Imec, 75 Kapeldreef, B-3001 Leuven, Belgium

15:30

Coffee break

16:00

Poster (Session I) 3min Flash presentations

17:30

**A deep learning model for wafer defect map classification :
perspective in classification performance and computational volume**

C.P1.2

Minjoo Kim, Jinhyung Tak, Jungha Kim, Janghoon Oh, Seungwoo Lee,
Sunghun Park, Sungsoo Yim, Heeil Hong, Jooyoung Lee

DRAM Product Engineering Team, Memory Division, Samsung Electronics Co.,
Ltd

17:30

Band gaps of hexagonal rare earth nitrides by ab initio calculations

C.P1.3

Maciej J. Winiarski, Dorota A. Kowalska
Institute of Low Temperature and Structure Research, Polish Academy of
Sciences, Okólna 2, 50-422 Wrocław, Poland

17:30

**Quantifying electron cascade size in various irradiated materials for
free-electron laser applications**

C.P1.5

Vladimir Lipp, Igor Milov, Nikita Medvedev
Vladimir Lipp (1,2), Igor Milov (3), Nikita Medvedev (4,5) (1) Center for
Free-Electron Laser Science (CFEL), DESY, 22607 Hamburg, Germany (2)
The Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of
Sciences, Radzikowskiego 152, 31-342 Kraków (3) Industrial Focus Group
XUV Optics, MESA Institute for Nanotechnology, University of Twente,
Drienerlolaan 5, 7522 NB Enschede, The Netherlands (4) Institute of
Physics, Czech Academy of Sciences, Na Slovance 2, Prague 8, 18221, Czech
Republic (5) Institute of Plasma Physics, Czech Academy of Sciences, Za
Slovankou 3, 182 00 Prague 8, Czech Republic

17:30

Strain induced octahedral tilting in SrNbO₃ perovskite

C.P1.6

Victor Rosendal, Walber Hugo Brito, Mads Brandbyge, Nini Pryds, Dirch
Hjorth Petersen

Department of Energy Conversion and Storage, Technical University of Denmark, Kongens Lyngby, Denmark, Departamento de Física, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil, Department of Physics, Technical University of Denmark, Kongens Lyngby, Denmark, Department of Energy Conversion and Storage, Technical University of Denmark, Kongens Lyngby, Denmark, Department of Energy Conversion and Storage, Technical University of Denmark, Kongens Lyngby, Denmark

17:30

Importance of aqueous phase for interfacial phenomena: insight from hybrid DFT - Continuum Solvation Approach

C.P1.7

Thomas Bornhake(1,2), Oskar Cheong(1,2,3) , Stefan Rudin(1) and Piotr M. Kowalski(1,2)

1 Institute of Energy and Climate research (IEK-13, IEK-6), Forschungszentrum Jülich GmbH, 52425 Jülich, Germany 2 Jülich Aachen Research Alliance, JARA-CSD and JARA-ENERGY, 52425 Jülich, Germany 3 Chair of Theory and Computation of Energy Materials, Faculty of Georesources and Materials Engineering, RWTH Aachen University, 52062 Aachen, Germany

17:30

Molecular Dynamics Modeling of Dislocations for UO₂ and Ni Monte Carlo RBS/C Simulations

C.P1.8

Cyprian Mieszczynski 1, Przemysław Jozwik 1, Frederico Garrido 2, Kazimierz Skrobas 1,3, Kamila Stefanska-Skrobas 1, Renata Ratajczak 1, Jacek Jagielski 1,4, Eduardo Alves 5, Katharina Lorenz 5,6

1 National Centre for Nuclear Research, Soltana 7, 05-400 Otwock, Poland, 2 IJCLab, Université Paris-Saclay-CNRS, 91405 Orsay Campus, France, 3 Institute of High-Pressure Physics PAS, ul. Sokolowska 29/37, 01-142 Warsaw Poland, 4 Lukaszewicz Research Network - Institute of Microelectronics and Photonics, Wolczynska 133, 01-926 Warszawa, Poland, 5 Instituto de Plasmas e Fusão Nuclear, Instituto Superior Técnico - Campus Tecnológico e Nuclear, Universidade de Lisboa, Estrada Nacional 10, 2695-066 Bobadela, Portugal, 6 Instituto de Engenharia de Sistemas e Computadores - Microsistemas e Nanotecnologias, Rua Alves Redol 9, 1000-029 Lisbon, Portugal

Atomistic modeling of complex hybrid and biological systems: materials and interfaces : Yannick Dappe

8:30	Topologically non-trivial spin-textures and multiferroicity in 2D nickel dihalides Danila AMOROSO Université de Liège, NanoMat/Q-mat/CESAM, B-4000 Liège, Belgium Topologically non-trivial spin-textures and multiferroicity in 2D nickel dihalides	C.06.01
9:00	Protein folding and the Golem Clemence DEFEBVRE and Fabrizio CLERI* University of Lille, IEMN and Department of Physics, 59652 Villeneuve d'Ascq (France)	C.06.02
9:30	Strengths and Limitations of Using the Interface Force Field (IFF) to Assess Water Structures at Metal Surfaces Oskar Cheong [1,2,3], Michael H. Eikerling [1,2], Piotr M. Kowalski [1,2] 1 Theory and Computation of Energy Materials (IEK-13), Forschungszentrum Jülich GmbH, 52425 Jülich, Germany, 2 Jülich Aachen Research Alliance, JARA-CSD and JARA-ENERGY, 52425 Jülich, Germany, 3 Chair of Theory and Computation of Energy Materials, Faculty of Georesources and Materials Engineering, RWTH Aachen University, 52062 Aachen, Germany,	C.06.03
9:45	Ionic liquids in the bulk phase and at the interface with MoS₂: a first-principles and classical molecular dynamics study Irene AMIEHE ESSOMBA 1*, Guido ORI 1, Mauro BOERO 1,2 1. Université de Strasbourg, CNRS, Institut de Physique et Chimie des Matériaux de Strasbourg, UMR 7504, F-67034 Strasbourg, France 2 2. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya 464-8601, Japan	C.06.04
10:00	Computational Nanomedicine: 25 Years of Developing Improved Biomaterials, Drug Delivery Devices, and Vaccines Alaa Nahhas (a) and Thomas J. Webster (b)	C.06.05

a) Biochemistry Department, College of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia and the b) Universidade Federal do Piauí, Teresina, Brazil, Vellore Institute of Technology, Vellore, India, and Hebei University of Technology, Hebei, China

10:15 **Exploring structure-property relationships for hydration and carbonation of metal oxides for thermochemical energy storage** **C.06.06**

Aleksandr Shkatulov, Emre Genç, Ionut Tranca
German Aerospace Center – DLR e.V., Institute of Engineering
Thermodynamics, Pfaffenwaldring 38-40, 70569 Stuttgart, Germany, Gazi
University, Faculty of Science, Department of Physics, Ankara, Turkey, Vrije
Universiteit Brussel. Department of Chemistry (DSCH), Group Algemeine
Chemie (ALGC), Brussels, Belgium

10:30 **Coffee break**

Material design, comprehension and application by atomistic modeling: 2d materials, films and alloys -II :
Michal Hermanowicz

11:00 **Optical gaps and excitons in semiconducting MXenes predicted by many-body methods** **C.07.01**

František Karlický
Department of Physics, University of Ostrava, 30. dubna 22, 701 03 Ostrava,
Czech Republic

11:30 **Evolution of Compressive Stress During the Corrosion of Metals** **C.07.02**

Asghar Aryanfar, Abdel Rahman El Tallis Jaime Marian
American University of Beirut Arizona State University University of
California, Los Angeles

12:00 **LKMC modelling of CVD epitaxy of SiGe-based structures** **C.07.03**

D. Raciti¹, G. Calogero¹, R. Anzalone², G. Morale², D. Murabito², G.
Fisicaro¹, I. Deretzis¹, A. La Magna¹
¹ CNR Institute for Microelectronics and Microsystems (CNR-IMM), Catania,
Italy, ² STMicroelectronics, Catania, Italy

12:15 **Density Functional Tight Binding approach to study X-ray-induced structural transitions in solid materials** **C.07.04**

Vladimir Lipp, Victor Tkachenko, Michal Stransky, Bălint Aradi, Thomas Frauenheim, and Beata Ziaja

Vladimir Lipp(1,2), Victor Tkachenko(3,1,2), Michal Stransky(3,4), Bălint Aradi(5), Thomas Frauenheim(5,6,7), and Beata Ziaja(2,1) (1) Institute of Nuclear Physics, Polish Academy of Sciences, 31-342 Krakow, Poland (2) Center for Free-Electron Laser Science CFEL, DESY, 22607 Hamburg, Germany (3) European XFEL, 22869 Schenefeld, Germany (4) Institute of Physics of the Czech Academy of Sciences, 182 21 Prague, Czech Republic (5) Bremen Center for Computational Materials Science, Universitaet Bremen, 28359 Bremen, Germany (6) Shenzhen JL Computational Science and Applied Research Institute, Shenzhen 518110, China (7) Beijing Computational Science Research Center, Beijing 100193, China

12:30

Lunch break

14:00

Poster (Session 2) 3min Flash presentations

Poster Session 2 : Elena Levchenko and Yannick Dappe

17:30

O₂, H₂O, and CO₂ adsorption effects on the electronic and mechanical properties of alpha alumina

C.P2.1

F. J. Dominguez-Gutierrez(1,2), A. Aligayev(1), Q. Q. Xu(1), W. Y. Huo(1,3), S. Papanikolaou(1), M. Alava(1,4)

(1) NOMATEN CoE, National Centre for Nuclear Research, ul. A. Soltana 7, 05-400 Otwock, Poland, (2) Institute for Advance Computational Science, Stony Brook University, Stony Brook, NY 11749, USA, (3) College of Mechanical and Electrical Engineering, Nanjing Forestry University, Nanjing, 210037, China, (4) Department of Applied Physics, Aalto University, P.O. Box 11000, Aalto, 00076, Finland

17:30

Polymorphic nature of {332}< 113> twinning mode in BCC alloys

C.P2.2

P. Kwasniak(1) , F. Sun(2) , S. Mantri(3) , R. Banerjee(3), F. Prima(2)

(1). Center of Digital Science and Technology, Cardinal Stefan Wyszyński University in Warsaw, Wycickiego 1/3, 01-938 Warsaw, Poland (2). PSL Research University, Chimie ParisTech, CNRS, Institut de Recherche de Chimie Paris, 75005, Paris, France (3). Department of Materials Science and Engineering, University of North Texas, Denton, TX, 76207, USA

17:30	Magnetism in monolayer Mn₂CO₂ MXene Jiri Kalmar, Frantisek Karlicky Department of Physics, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic	C.P2.3
17:30	Elastically isotropic and metastable $\hat{\Gamma}$-Ti alloys – first principles investigation Cyprian Sobczak, Piotr Kwaśniak -Center of Digital Science and Technology, Cardinal Stefan Wyszyński University in Warsaw, Warsaw, Poland. (Cyprian Sobczak, Piotr Kwaśniak) - Institute of High Pressure Physics, of the Polish Academy of Sciences, Warsaw, Poland.(Cyprian Sobczak)	C.P2.4
17:30	Performance analysis of SnS solar cells using SnO₂ electron transport layer: numerical simulation and DFT calculations F. Djeflal ¹ , H. Ferhati ^{1,2} , A. Benyahia ¹ and Z. Dibi ³ ¹ LEA, Department of Electronics, University of Batna 2, Batna 05000, Algeria ² ISTA, University of Larbi Ben Mâhidi, Oum El Bouaghi, Algeria ³ University of Larbi Ben Mâhidi, Oum El Bouaghi, Algeria	C.P2.5
17:30	Combining Ab Initio Calculations and Experiments to Study the Ethanol Dehydrogenation Reaction on Pt-based Catalyst Oskar Cheong [1,2,3], Joachim Pasel [4], Johannes Häusser [4], Ralf Peters [4], Piotr M. Kowalski [1,2]	C.P2.6

1 Theory and Computation of Energy Materials (IEK-13), Forschungszentrum J  lich GmbH, 52425 J  lich, Germany, 2 J  lich Aachen Research Alliance, JARA-CSD and JARA-ENERGY, 52425 J  lich, Germany, 3 Chair of Theory and Computation of Energy Materials, Faculty of Georesources and Materials Engineering, RWTH Aachen University, 52062 Aachen, Germany, 4Institute of Energy and Climate Research, Electrochemical Process Engineering (IEK-14), Forschungszentrum J  lich GmbH, 52425 J  lich, Germany,

17:30 **Atomically-resolved modelling of excimer laser annealed silicon and SiGe alloys** **C.P2.7**

G. Calogero [1], D. Raciti [1], I. Deretzis [1], G. Fisicaro [1], A. Sciuto [1,5], P. Acosta-Alba [2], K. Huet [4], S. Kerdil  s [2], F. Cristiano [3], A. La Magna [1]

[1] CNR-IMM, Zona Industriale VIII Strada 5, 95121 Catania, Italy [2] Universit   Grenoble Alpes, CEA-LETI, 38000 Grenoble, France [3] LAAS, CNRS and Universit   de Toulouse, 7av. Du Col. Roche, 31400 Toulouse, France [4] Laser Systems & Solutions of Europe (LASSE), 145 rue des Caboeufs, 92230 Gennevilliers, France [5] Dipartimento di Fisica e Astronomia, Universit   di Catania, Via Santa Sofia 64, 95125 Catania, Italy

17:30 **Structure and bonding of vanadophosphate-based glasses: insights by first-principles molecular dynamics** **C.P2.8**

Steve Dave Wansi Wendji,* Carlo Massobrio,* Guido Ori*

*Institute of Physics and Chemistry of Materials of Strasbourg (IPCMS), UMR 7504 CNRS - University of Strasbourg, France.

17:30 **Ab Initio Design of Plasmonic Materials Using the Real-Time TDDFT U Method** **C.P2.9**

R. Duddy1, Dr L. Stella1,2, and Dr M. Gr  ning1

1 Atomistic Simulation Centre School of Mathematics and Physics, Queen  s University Belfast, Road Belfast, BT7 1NN, Belfast, UK 2 School of Chemistry and Chemical Engineering, Queen  s University Belfast, Stranmillis Road Belfast, Belfast, BT9 5AG, UK

WEDNESDAY, 21 SEPTMEBER 2022

14:00 **SYMPOSIUM C AWARD ANNOUNCEMENT**



Symposium E

Sessions: Room 107 | MINI Building

Poster Session: Small Hall | Main Building

Functional materials:

Sustainable materials for chemical and electrochemical energy storage

Symposium Organizers: **Arndt REMHOF** EMPA Switzerland

Claudio PISTIDDA Helmholtz Zentrum Hereon Germany

Dorthe BOMHOLDT RAVNSBÆK Aarhus University Denmark

Michael HEERE Technische Universität Braunschweig Germany

Symposium E Program

MONDAY, 19 SEPTEMBER 2022

Electrodes for novel Li- and Na-ion batteries : Dorte B. Ravnsbæk

9:05 **Crystal Chemistry of $\text{Na}_x(\text{M},\text{M}')_2(\text{PO}_4)_3$ Nasicon Electrodes ($\text{M},\text{M}' = \text{V}, \text{Fe}, \text{Mn}, \text{Ti}, \text{Cr}$)** **E.01.01**

S. Park, [1,2,3], Z. Wang [4], Z. Deng [4], P. Canepa [4], F. Fauth [5], D. Carlier [2], L. Croguennec [2], J.N. Chotard [1], C. Masquelier [1]

[1] LRCS Amiens, France, [2] ICMCB Bordeaux, France, [3] TIAMAT Energy, [4] NUS Singapore, [5] ALBA Synchrotron, Spain

9:45 **Improved performance of Co-free lithium ion battery cathodes via structural engineering and chemical doping** **E.01.02**

Thomas Thersleff (1), Jordi Biendicho (2), Kunkanado Prakasha (2), Evgeniya Khomyakova (3), Jekabs Grins (1), Aleksander Jaworski (1), Gunnar Svensson (1)

(1) Department of Materials and Environmental Chemistry, Arrhenius Laboratory, Stockholm University, SE-10691 Stockholm, Sweden, (2) Catalonia Institute for Energy Research-IREC, Sant Adrià de Besòs, 08930 Barcelona, Spain, (3) Cerpotech, Kvenildmyra 6, 7093 Heimdal, Norway

10:00 **Intercalation driven disordering of monoclinic distorted VO_2 as cathode in Li-ion batteries** **E.01.03**

Morten Johansen, Dorte B. Ravnsbæk

Department of Chemistry, Aarhus University, Langelandsgade 140, 8000 Aarhus C, Denmark

10:15 **Exploring Fe- PO_4 -F Materials for High Performance Energy Storage** **E.01.04**

Mengyuan Du, Xuelian Liu, Jiande Wang, Koen Robeyns, Yaroslav Filinchuk, Qi Zhu, Varun Kumar, Yann Garcia, Gheorghe Borodi, Cristian Morari, Jean-Francois Gohy and Alexandru Vlad

M. Du, Dr. X. Liu, Dr. J. Wang, Dr. K. Robeyns, Dr. Prof. Y. Filinchuk, Dr. Q. Zhu, Dr. V. Kumar, Prof. Y. Garcia, Prof. J.-F. Gohy and Prof. A. Vlad Institute of Condensed Matter and Nanosciences Université catholique de Louvain Louvain-la-Neuve, B-1348, Belgium Dr. G. Borodi, Dr. C. Morari Institutul National de Cercetare-Dezvoltare pentru Tehnologii Izotopice si Moleculare Cluj-Napoca Str. Donat nr. 67-103 PO 5 Box 700 400293 Cluj-Napoca, Romania

10:30 **Coffee break**

Electrodes for novel Li- and Na-ion batteries : Rosa Palacin

11:00 **Towards safe and sustainable Na-ion batteries**

E.02.01

D. Saurel¹, M. Reynaud¹, M. Galceran¹, C. Berlanga^{1,2}, E. Gucciardi¹, J. Carrasco¹, A. Wizner^{1,2}, M. Casas-Cabanas^{1,3}

¹ Centre for Cooperative Research on Alternative Energies (CIC energiGUNE), Basque Research and Technology Alliance (BRTA), Alava Technology Park, Albert Einstein 48, 01510 Vitoria-Gasteiz, Spain, ² Science and technology faculty, Basque Country University (UPV/EHU), 48940 Leioa, Bilbao, Spain, ³ Ikerbasque, The Basque Foundation for Science, 48013 Bilbao, Spain

11:30 **Functional Nanomaterials for Safe and Reliable Li and Li-S Batteries**

E.02.02

Srikanth Mateti, Baozhi Yu, Ye Fan, Qiran Cai, Ying Chen*

Institute for Frontier Materials, Deakin University, 3216, Victoria, Australia.

Novel Effects of Iron Substitution in WadsleyâRoth Phase Titanoniobate Anode towards Faster Li Storage with Enhanced

11:45 **durability**

E.02.03

Jie Zheng, Rui Xia, Najma Yaqoob, Qianyuan Qiu, Yongdan Li, Kangning Zhao, Payam Kaghazchi, John E ten elshof and Mark Huijben

Jie Zheng, Rui Xia, Payam Kaghazchi, John E ten elshof and Mark huijben: MESA Institute for Nanotechnology, P. O. Box 217, Enschede 7500AE, University of Twente, Netherlands, Najma Yaqoob and Payam Kaghazchi: Forschungszentrum JuÉlich GmbH, Institute of Energy and Climate Research, Materials Synthesis and Processing (IEK-1), JuÉlich 52425, Germany, Qianyuan Qiu and Yongdan Li: Department of Chemical and Metallurgical Engineering, Aalto University, Kemistintie 1, FI-00076, Aalto, Finland, Kangning Zhao: State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, International School of Materials Science and Engineering, Wuhan University of Technology, Wuhan, 430070, China.

- 12:00 **Hydrothermal synthesis of a novel rutile Fe_{0.8}Nb_{1.5}O_{4.6} and its orthorhombic polymorph as anodes for Li-ion batteries** **E.02.04**
 Wilgner L. da Silva, Emma Kendrick, Richard Walton

Department of Chemistry and Warwick Manufacturing Group, University of Warwick, Gibbet Hill Road, Coventry CV4 7AL, United Kingdom, School of Metallurgy and Materials, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom, Department of Chemistry, University of Warwick, Gibbet Hill Road, Coventry CV4 7AL, United Kingdom

- 12:15 **Delamination of first-generation lithium-ion battery anodes, via water, and its reclamation into new batteries.** **E.02.05**

Alex Sargent, Phoebe Allan, Peter Slater, Alex Watson, Ben Spencer, Zoe Henderson, Rob Sommerville and Emma Kendrick

University of Birmingham, University of Birmingham, University of Birmingham, University of Manchester, University of Manchester, University of Manchester, University of Birmingham, University of Birmingham

- 12:30 **Lunch break**

Organic materials for energy applications : Elie-Elisee Georges Paillard

- Sustainable Batteries and Electrocatalysis for Clean Energy Technologies** **E.03.01**
 14:00 Magda Titirici, Heather Au, Maria Crespo, Hui Luo
 Imperial College London
- Organic Quinone based Conducting Redox Polymers for Sustainable and Green Energy Storage** **E.03.02**
 14:30 Rebecka L  fgren, Dr. Kouki Oka, Dr. Rikard Emanuelsson, Prof. Hiroyuki Nishide, Prof. Kenichi Oyaizu, Prof. Maria Str  mme, Prof. Martin Sj  din
- Department of Applied Chemistry and Research Institute for Science and Engineering Waseda University: Dr. K. Oka, Prof.H. Nishide, Prof.K. Oyaizu
 Nanotechnology and Functional Materials, Materials Science and Engineering The   ngstr  m Laboratory, Uppsala University: Dr. K. Oka, R. L  fgren, Dr. R. Emanuelsson, Prof.M. Str  mme, Prof.M. Sj  din
- Alcohol-based electrolytes: an alternative between aqueous and nonaqueous for increased voltage and high-rate lithium-ion batter** **E.03.03**
 14:45 Hwei Xu, Alexandru Vlad.
- Institute of Condensed Matter and Nanosciences, Molecular Chemistry, Materials and Catalysis, Universit   catholique de Louvain, Louvain-la-Neuve B-1348, Belgium hwei.xu@uclouvain
- Organic Batteries: The Fascinating Trip Towards More Sustainable Batteries** **E.03.04**
 15:00 Rebecca Grieco, Diego A. Alv  n, Marta Liras, Nagaraj Patil, and Rebeca Marcilla
- Electrochemical Processes Unit, IMDEA Energy, Avda. Ram  n de la Sagra 3, 28935 M  stoles, Spain
- Design of Conjugated Air-stable High-voltage Sulfonamides and Cyanamides and Their Potential Energy Storage Applications** **E.03.05**
 15:15 Xiaolong Guo, Jiande Wang, Petru Apostol, Darsi Rambabu, Mengyuan Du, Xiaodong Lin, Alexandru Vlad
- Institute of Condensed Matter and Nanosciences, Molecular Chemistry, Materials and Catalysis, Universit   catholique de Louvain, Louvain-la-Neuve B-1348, Belgium

15:30 **Coffee break**

Multivalent batteries : Christian Masquelier

16:00 **Lessons learnt in the development multivalent battery technologies** **E.04.01**
M. Rosa Palacin

ICMAB-CSIC, Campus UAB 08193 Bellaterra, Catalonia (SPAIN)

16:30 **Electrolyte additives as effective way to improve aqueous Mg-air battery performance** **E.04.02**

Darya Snihirova , Linqian Wang, Min Deng, Bahram Vaghefinazari, Daniel HÄŕŕche, Sviatlana V. Lamaka, Mikhail L. Zheludkevich

Institute of Surface Science, Helmholtz-Zentrum Hereon, 21502 Geesthacht, Germany Institute of Materials Science, Faculty of Engineering, Kiel University, 24143 Kiel, Germany

16:45 **TMDCs and their heterostructures for magnesium-ion batteries** **E.04.03**
Conor Jason Price, Steven Paul Hepplestone
University of Exeter

17:00 **Outstanding Battery Performance at Room and Cold Temperatures of Efficient All Solid State Rechargeable Zinc-air Batteries with** **E.04.04**

Zahra Abedi, Desiree Leistenschneider, Weixing Chen, and Douglas G. Ivey
Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

17:15 **Zinc electrodeposition mechanism revealed by in situ liquid cell transmission electron microscopy** **E.04.05**
Zixuan Li, Alex Robertson
University of Oxford

Poster Session : -

17:30 **Nano-Si@MOF glass composite for lithium-ion batteries** **E.P.1**

Jiajia Yan 1, Chengwei Gao 2, Yanfei Zhang 3 & Yuanzheng Yue 1

1 Department of Chemistry and Bioscience, Aalborg University, Aalborg, Denmark
 2 Laboratory of Infrared Material and Devices, Ningbo University, Ningbo, China
 3 School of Materials Science and Engineering, Qilu University of Technology, Jinan, China

- 17:30 **Synthesis of High-Efficient and Swelling constrained Double-layered SiOx/Mg2SiO4/SiOx Composite anode for Lithium-ion Battery** **E.P.2**
 Asif Raza, Jeong-Hee Choi, Sang-Min Lee

Next-Generation Battery Research Center, Korea Electrotechnology Research Institute, South Korea,
 Electric Energy Materials Engineering, University of Science and Technology, South Korea,
 Graduate Institute of Ferrous and Energy Materials Technology, Pohang University of Science and Technology, South Korea

- 17:30 **3D-printed Ti6Al4V electrodes with surface nanostructuration and iridium catalyst coating for water oxidation** **E.P.3**

André Hofer [a], Sebastian Wachter [b], Zongwen Fu [b], Carolin Köllner [b,c], Julien Bachmann [a]
 [a] Friedrich-Alexander Universität Erlangen-Nürnberg (FAU), Department of Chemistry and Pharmacy, Chemistry of Thin Film Materials, IZNF / Cauerstr. 3, 91058 Erlangen, Germany,
 [b] Friedrich-Alexander Universität Erlangen-Nürnberg (FAU), Department of Materials Science, Joint Institute of Advanced Materials and Processes, ZMP / Dr.-Mack- Str. 77, 90762 Fürth, Germany,
 [c] Friedrich-Alexander Universität Erlangen-Nürnberg (FAU), Department of Materials Science, Chair of Materials Science and Engineering for Metals (WTM) / Martensstraße 5, 91058 Erlangen, Germany

- 17:30 **Hybrid supercapacitors: A simple electrochemical approach to determine optimum potential window and charge balance** **E.P.4**
 Doha M.Sayed Manar M.Taha Loujain G.Ghanem Mohamed S.El-Deab Nageh K.Allam

Energy Materials Laboratory, School of Sciences and Engineering, The American University in Cairo, New Cairo, 11835, Egypt

- 17:30 **Highly Stable Supercapacitor Devices Based on Three-Dimensional Bioderived Carbon Encapsulated g-C3N4 Nanosheets** **E.P.5**

Manar M Taha, Loujain G Ghanem, Mahmoud A Hamza, Nageh K Allam

Energy Materials Laboratory, School of Sciences and Engineering, The American University in Cairo, New Cairo, 11835, Egypt

- 17:30 **Symmetric supercapacitor devices based on pristine g-C₃N₄ mesoporous nanosheets with exceptional stability** **E.P.6**

Loujain G Ghanem, Mahmoud A Hamza, Manar M Taha, Nageh K Allam

Energy Materials Laboratory, School of Sciences and Engineering, The American University in Cairo, New Cairo, 11835, Egypt

- 17:30 **A mesoporous ternary transition metal oxide nanoparticle composite for high-performance asymmetric supercapacitor devices** **E.P.7**
Nourhan M Deyab, Manar M Taha, Nageh Allam

aEnergy Materials Laboratory, School of Sciences and Engineering, The American University in Cairo, New Cairo 11835, Egypt.

- 17:30 **In-Plane Printed Batteries Based on Mxenes** **E.P.8**

Arailym Nurpeissova, Alisher Kumarov

Institute of Batteries LLC, 53 Kabanbay Batyr Ave. Nur-Sultan, 010000 Kazakhstan

- 17:30 **Investigation of structural disordering in NaCrO₂ cathodes during Na-ion battery charge** **E.P.9**

Bettina Pilgaard Andersen, Christian Lund Jakobsen, Espen Drath B  jesen, and Dorthe Bomholdt Ravnsb  k

Department of Chemistry, Aarhus University, Langelandsgade 140, 8000 Aarhus, Denmark, Department of Physics, Chemistry, and Pharmacy, University of Southern Denmark, Campusvej 55, 5230 Odense, Denmark, The Interdisciplinary Nanoscience Center, Aarhus University, Gustav Wieds Vej 14, 8000 Aarhus, Denmark, Department of Chemistry, Aarhus University, Langelandsgade 140, 8000 Aarhus, Denmark

- 17:30 **Experimental and Computational Studies on the Formation of Mixed Amide-Hydride Solid Solutions for CsNH₂-CsH System** **E.P.10**

Thi-Thu Le, Archa Santhosh, Simone Bordignon, Michele R. Chierotti, Paul Jerabek, Thomas Klassen, Martin Dornheim, Claudio Pistidda,
Institute of Hydrogen Technology, Helmholtz-Zentrum hereon GmbH, Max-Planck-Straße 1, D-21502 Geesthacht

- | | | |
|-------|---|---------------|
| 17:30 | <p>Perovskite oxide as the bifunction oxygen catalytic cathode for high energy efficiency Li-oxygen batteries at elevated temperature</p> <p>Qianyuan Qiu, Yongdan Li</p> <p>Department of Chemical and Metallurgical Engineering, Aalto University, Kemistintie 1, FI-00076 Aalto, Finland</p> | E.P.11 |
| 17:30 | <p>Incorporating iodide ions in porous electrodes improves energy density in hybrid halide perovskite-based supercapacitors.</p> <p>Ankur Yadav, Prem Sagar Shukla, Monojit Bag</p> <p>Indian Institute of Technology(IIT) Roorkee</p> | E.P.12 |
| 17:30 | <p>Comparative analysis of Al-doped Li₇La₃Zr₂O₁₂ solid electrolytes through solid state and sol-gel routes</p> <p>Janez Kolarić, Seyedabolfazl Mousavihashemi, Benjamin P. Wilson, Eeva-Leena Rautama, Tanja Kallio</p> <p>Department of Chemistry and Materials Science, School of Chemical Engineering, Aalto University, 02150 Espoo, Finland</p> | E.P.13 |
| 17:30 | <p>Preparation of silica embedded pore-filling ion exchange membrane for high performance of reverse electrodialysis</p> <p>Haeun Kim, Donghyun Kim, Haeun Seo, Dong Gyeong Kim, Hyeryang Choi, SeungCheol Yang</p> <p>Department of Materials Convergence and System Engineering, Changwon National University, Changwon, Gyeongsangnam 51140, Republic of Korea</p> | E.P.14 |
| 17:30 | <p>Characterization of Si nanosheets by Al doping as anode materials for rechargeable Mg-ion batteries</p> <p>Sang-Won Park, Jung Hoon Ha, Byung-Won Cho, Heon-jin Choi</p> | E.P.15 |

Department of Materials Science and Engineering (Yonsei University), Center for Energy Storage Research (Korea Institute of Science and Technology), Center for Energy Storage Research (Korea Institute of Science and Technology), Department of Materials Science and Engineering (Yonsei University),

- 17:30 **The Crucial and Underestimated Role of the Current Collector in Aluminum Batteries** **E.P.16**
Eugen Zemlyanushin, Fatemehsadat Rahide, Sonia Dsoke

Institute for Applied Materials (IAM) Karlsruhe Institute of Technology (KIT), Hermann-von-Helmholtz Platz 1, 76344 Eggenstein-Leopoldshafen, Germany

- 17:30 **Bifunctional Catalytic Activity of the Solvothermally Synthesized CeO₂ Nanospheres/NiO Nanoflakes Nanocomposites** **E.P.17**
Debanjali Ghosh Debababrata Pradhan
Research Scholar Professor

- 17:30 **Nanocomposite materials for porous electrodes based on 2D transition metal dichalcogenides** **E.P.19**
Felix Boll, Melissa Happel, Leonardo Merola, Teresa Gatti
Center for Materials Research, Justus Liebig University, Heinrich-Buff-Ring 17, 35392 Giessen, Germany

- 17:30 **Fabrication of highly efficient electrodes based on transition metal dichalcogenides for electrochemical study** **E.P.20**
Sachin A. Pawar, Jiaqui Liu, Namiki Uezeno, Shukur Gofurov, Oktariza Lingga Ghufira, Muhammad Monirul Islam, Takeaki Sakurai

Sachin A. Pawar, Jiaqui Liu, Namiki Uezeno, Shukur Gofurov, Oktariza Lingga Ghufira, Muhammad Monirul Islam, Takeaki Sakurai, Department of Applied Physics, Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8573, Japan Muhammad Monirul Islam, Alliance for Research on the Mediterranean and North Africa (ARENA), University of Tsukuba, Tsukuba, Ibaraki 305-8573, Japan

- 17:30 **Functionalisation of nanochannels for the development of a sustainable and efficient low-grade waste heat harvester** **E.P.21**
- Kamil Rahme, Anjali Ashokan, Ievgen Nedrygailov, Scott Monaghan, Rupa Ranjani, Paul Hurley, Subhajit Biswas and Justin D. Holmes
School of Chemistry & Tyndall National Institute, University College Cork, Cork, Ireland AMBER Centre, Environmental Research Institute, University College Cork, Ireland
- 17:30 **Nano-coatings of fluorinated polyimide on cathode materials for stabilizing and performance of high-energy lithium ion batteries** **E.P.23**
- Myeonggeun Jang, Hohyeon Noh, Hyun Min Jung*
Department of Applied Chemistry, Kumoh National Institute of technology
Yangho-dong 1, Gumi, Korea
- 17:30 **A Binder-Free Cathode Based on LiFePO₄/CNT-Gr Enhanced with PANI for Lithium-Ion Battery** **E.P.24**
- Wen Xie, Wenxian Yang, Ping Xie

State Key Laboratory of Solidification Processing School of Materials Science and Engineering Northwestern Polytechnical University
- 17:30 **Biomass-Derived Graphitic Carbon Encapsulated FeS₂ as a Cathode Material for High-Performance Lithium Ion Batteries** **E.P.25**
- Ying Liu*, Jou-Hyeon Ahn*, **

*Department of Chemical Engineering, Gyeongsang National University, 501 Jinju-daero, Jinju 52828, Republic of Korea **Department of Materials Engineering and Convergence Technology, Gyeongsang National University, 501 Jinju-daero, Jinju 52828, Republic of Korea
- 17:30 **Entrapping Polysulfides Using Hollow Carbon Spheres with Controlled Internal SiO₂ Content for Lithium-Sulfur Batteries** **E.P.26**
- Jou-Hyeon Ahn*, **, Ying Liu*, Yuanzheng Sun**, Dong Jun Lee*

*Department of Chemical Engineering, Gyeongsang National University, Jinju 52828, Republic of Korea **Department of Materials Engineering and Convergence Technology, Gyeongsang National University, Jinju 52828, Republic of Korea

17:30 **A photoelectrochemical device with the metal hydride-based hydrogen storage** **E.P.27**

Yuan-Chih Lin, Krzysztof Bienkowski, Renata Solarska, Matylda N. Guzik.

Department of Technology Systems, University of Oslo, NO-2027 Kjeller, Norway, Laboratory of Molecular Research for Solar Energy Innovations, Centre of New Technologies, University of Warsaw, 02-097 Warsaw, Poland, Laboratory of Molecular Research for Solar Energy Innovations, Centre of New Technologies, University of Warsaw, 02-097 Warsaw, Poland, Department of Technology Systems, University of Oslo, NO-2027 Kjeller, Norway.

17:30 **Properties of CNW and Graphite slurry applied anode materials for Lithium-ion Batteries** **E.P.28**

Kangmin Kim 1, Seokhun Kwon 1, Chulsoo Kim 1, Chaehyun Ahn 1, Hyunil Kang 1, Kyuri Shin 2, Jung Hyun Kim 2 and Wonseok Choi 1*

Department of Electrical Engineering, Hanbat National University, Daejeon 34158, Republic of Korea , Kangmin Kim 1, Seokhun Kwon 1, Chulsoo Kim 1, Chaehyun Ahn 1, Hyunil Kang 1, Wonseok Choi 1* Department of Advanced Materials Engineering, Hanbat National University, Daejeon 34158, Republic of Korea , Kyuri Shin 2, Jung Hyun Kim 2

17:30 **Biodegradable and Biocompatible Gel Electrolyte for Edible Supercapacitors** **E.P.29**

Deniz Keskin 1, Mete Batuhan Durukan 1,2, Melih Ogeday Cicek 1, Yigithan Tufan 1, Orcun Dincer 1, Batur Ercan 1, Simge Cinar 1,2 and Husnu Emrah Unalan 1,2

Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey

17:30 **Tuneable naphthalene-based microporous polyimide networks for CO₂ capture and conversion** **E.P.30**

Basiram Brahma Narzary, Dr. Benjamin C. Baker, Dr Neha Yadav, Dr. Jie Chen, Dr Valerio D'Elia, Prof. Charl F.J. Faul*

Basiram Brahma Narzary, Dr. Benjamin C. Baker, Prof. Charl F.J. Faul*, University of Bristol, School of Chemistry, Bristol, UK Dr Neha Yadav, Dr Valerio D'Elia, School of Molecular Science and Engineering, VISTEC, Thailand Dr. Jie Chen, Fuzhou University, College of Environment and Resources, Fuzhou, China

17:30 **AI3 Doped LiNi_{0.97}Co_{0.03}O₂ Cathodes For Rapid Charging And Dramatic Cycling Performance** **E.P.31**

Eui Jeong Park¹, Hae In Kim¹, Hyun Ju Jang¹, Thi Bich Thuy Tran¹, Il Song Kim¹, Tae Whan Hong¹, Jeong Won Kang¹, Hak Won Kim¹, Yun Kyung Lee¹, Jong Tae Son¹*

¹ Department of Polymer Science and Engineering, Korea National University of Transportation, Chungju, Chungbuk 27469, Republic of Korea

17:30 **Electrohydrodynamic 3D printing of aqueous solutions for sustainable energy storage** **E.P.32**

Ander Reizabal, Carlos M. Costa, Paula G. Saiz, Senentxu Lanceros-Mendez, Paul Dalton

Phil and Penny Knight Campus for Accelerating Scientific Impact, University of Oregon, 1505 Franklin Boulevard, Eugene 97403, OR, USA
BCMaterials, Basque Center for Materials, Applications and Nanostructures, UPV/EHU Science Park, 48940 Leioa, Spain
Departamento de Química Física, Facultad de Ciencia y Tecnología, Universidad del País Vasco (UPV/EHU), Apdo. 644, Bilbao, Spain
Centre of Physics, University of Minho 4710-053 Braga, Portugal
Institute of Science and Innovation for Bio-Sustainability (IB-S), University of Minho,

17:30 **Multifunctional and Physically Transient Supercapacitors, Triboelectric Nanogenerators, and Capacitive Sensors** **E.P.34**

Mete Batuhan Durukan , Melih Ogeday Cicek , Doga Doganay , Mustafa Caner Gorur, Simge Cinar, Husnu Emrah Unalan

Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey , Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey , Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey

17:30 **LIB performance enhancement by modifying Si structure and electrolyte optimization** **E.P.35**

Khurram Saleem, Syed Muqarab, Jonas Drewes, Sandra Hansen, Ulrich SchÄrmann, Rainer Adelung, Lorenz Kienle

Institute for Material Science and Engineering, University of Kiel, Germany

- 17:30 **Fabrication of supported, UV cured cation exchange membranes - study on formulation of crosslinkable ionomer precursor mixtures.** **E.P.36**

Daniel Firganek, Mateusz Donten, Bart Van der Bruggen

Daniel Firganek, Mateusz Donten - Amer-Sil S.A., 61 Rue D'Olm, L-8281, Kehlen, Luxembourg, Bart Van der Bruggen - Department of Chemical Engineering, KU Leuven, Celestijnenlaan 200F, B-3001, Leuven, Belgium

- 17:30 **Synthesis of self-healing, vitrimer-like polysulfides as solid polymer electrolytes for lithium-ion batteries.** **E.P.37**

Carla BARAKAT, He JIA, Jean-François GOHY

Chemistry Department - Institute of Condensed Matter and Nanosciences - BSMA

- 17:30 **Low-cost and high throughput synthesis of ZnO nanostars for Energy Storage applications.** **E.P.38**

G. Di Mari (1,2), G. Mineo (1,2), G. Malandrino (3), G. Franz   (2), S. Mirabella (1,2), E. Bruno (1,2), V. Strano (2)

(1) Dipartimento di Fisica e Astronomia â€E. Majoranaâ€, Universit  degli Studi di Catania, Via S. Sofia 64, I-95123, Catania, Italy, (2) CNR-IMM, Via S. Sofia 64, I-95123, Catania, Italy. (3) Dipartimento di Scienze Chimiche, Universit  degli Studi di Catania, INSTM UdR Catania, Viale A. Doria 6, I-95125, Catania, Italy

- 17:30 **One-step hydrothermal synthesis of WO₃ nanostructures and optimization for energy storage application** **E.P.39**

G. Mineo^{1,2}, M. Scuderi³, S. Mirabella^{*1,2}, E. Bruno^{1,2}

1 Dipartimento di Fisica e Astronomia â€Ettore Majoranaâ€, Universit  degli Studi di Catania via S. Sofia 64, 95123 Catania, Italy, 2 CNR-IMM (Catania Universit ) via S. Sofia 64, 95123 Catania, Italy, 3 IMM-CNR, VIII strada 5, 95121 Catania, Italy,

- 17:30 **Half-cell water electrolysis using a WO₃ red-ox mediator electrode** **E.P.40**

Martins Vanags, Anzelms Zukuls, Ramona Dudena, Andris Ļutka
 Institute of Materials and Surface Engineering, Faculty of Materials Science and
 Applied Chemistry, Riga Technical University, P. Valdena Street 3, Riga LV1048,
 Latvia

17:30 **Electrochemical Evaluation of Zinc-Terephthalate Metal-Organic Frameworks as Anode Materials for Rechargeable Batteries** **E.P.41**

Satoshi Chubachi, Tensho Nakamura, Tsukasa Yoshida
 Yamagata University

17:30 **Utilizing Native Lignin as Redox-Active Material in Conductive Wood for Electronic and Energy Storage Applications** **E.P.42**

Van Chinh Tran 1,2, Gabriella G. Mastantuoni 3,4, Dagmawi Belaineh 1,5, Selda Aminzadeh 4, Lars A. Berglund 4, Magnus Berggren 1,2, Qi Zhou 3,4, Isak Engquist 1,2.

1. Laboratory of Organic Electronics, Department of Science and Technology, Linköping University, 60174 Norrköping, Sweden. 2. Wallenberg Wood Science Center, ITN, Linköping University, SE-601 74 Norrköping, Sweden 3. Division of Glycoscience, Department of Chemistry, KTH Royal Institute of Technology, AlbaNova University Centre, 106 91 Stockholm, Sweden. 4. Wallenberg Wood Science Center, Department of Fiber and Polymer Technology, KTH Royal Institute of Technology, 100 44 Stockholm, Sweden. 5. RISE Research Institutes of Sweden, Bio- and Organic Electronics, Bredgatan 35, 60221 Norrköping, Sweden.

17:30 **Tailoring surface composition of Na⁺-alumina-zirconia composite electrolytes for sodium high-temperature batteries** **E.P.43**

Yebin Cho, Keeyoung Jung, Jin Hyeok Choi, Younki Lee

Department of Materials Engineering and Convergence Technology, Gyeongsang National University, Jinju, Gyeongnam 52828, Republic of Korea, Materials Research Division, Research Institute of Industrial Science and Technology (RIST), Pohang, Gyeongbuk 37673, Republic of Korea, Energy Storage Group, KEPCO Research Institute, Daejeon 34056, Republic of Korea, Department of Materials Engineering and Convergence Technology, Gyeongsang National University, Jinju, Gyeongnam 52828, Republic of Korea,

17:30 **GRAPHENE-SUPPORTED NOVEL CHEMISTRIES AS ELECTRODES FOR LITHIUM-ION BATTERIES** **E.P.44**

M. Sidoli (1,2), G. Magnani (1,2), S. Scaravonati (1,2), A. Morengi (1,2), L. Fornasini (1), V. Vezzoni (1,2), G. Bertoni (3), M. Gaboardi (4), M. Ricci (1,2), D. Pontiroli (1,2)

(1) Mathematical, Physical and Computer Sciences Department, University of Parma, Parma, Italy, (2) National Interuniversity Consortium of Materials Science and Technology (INSTM), Florence, Italy, (3) CNR NANO, Modena, Italy, (4) ELETTRA Synchrotron Trieste, Italy

17:30 **Metal-doped laser scribed graphene for energy and sensing applications** **E.P.45**

D. Pontiroli (1), V. Vezzoni (1), L. Fornasini (1), S. Scaravonati (1), A. Morengi (1), G. Magnani (1), G. Bertoni (2), L. Aversa (3), R. Verucchi (3), M. Ricci (1)

(1) Nanocarbon Laboratory, Department of Mathematical, Physical and Computer Sciences & INSTM, University of Parma, Parco Area Delle Scienze 7/A, 43124, Parma, Italy, (2) CNR, Istituto Nanoscienze, Via Campi 213/A, 41125, Modena, Italy, (3) IMEM-CNR, Institute of Materials for Electronics and Magnetism, Via Alla Cascata 56/C, 38123, Povo, Trento, Italy

17:30 **Substituted $\text{Na}_{1-x}\text{Ti}_2\text{-xMx}(\text{PO}_4)_3$ (M = Zr(IV), Hf(IV)) anodes' electrochemical properties and stability for aqueous SIBs** **E.P.46**

Skirmante Tutliene, Jurgis Pilipavicius, Jurga Juodkazyte, Linas Vilciauskas

Center for Physical Sciences and Technology, Saulėtekio av. 3, LT-10257,
Vilnius, Lithuania

17:30 **ACTIVATED BIOCHARS FROM CARBON WASTE MATERIALS FOR
SUPERCAPACITOR APPLICATIONS** **E.P.47**

G. Magnani (1,2), S. Scaravonati (1,2), A. Morengi (1,2), A. Rinaldi (1,2), M.
Sidoli (1,2), A. Girella (3), C. Milanese (3), M. Riccà (1,2), D. Pontiroli (1,2)

1) Mathematical, Physical and Computer Sciences Department, University of
Parma, Parma, Italy, 2) National Interuniversity Consortium of Materials
Science and Technology (INSTM), Florence, Italy, 3) Pavia Hydrogen Lab,
C.S.G.I. - Department of Chemistry, Physical Chemistry Division University of
Pavia, Pavia, Italy

17:30 **Operando GC-MS Monitoring of Gaseous Decomposition Products from
Electrolytes containing SEI forming additives in LIB** **E.P.48**

Christiane Groher (1), Damian Cupid (1), Egon-Erwin Rosenberg (2), Jürgen
Kahr (1)

(1) AIT Austrian Institute of Technology GmbH, Center for Low-Emission
Transport, Electric Drive Technologies, Giefinggasse 2, 1210 Vienna, Austria,
christiane.groher@ait.ac.at, (2) Vienna University of Technology, Institute of
Chemical Technologies and Analytics, Austria, Getreidemarkt 9/164 AC, 1060,
Vienna, Austria, egon.rosenberg@tuwien.ac.at

17:30 **Investigation of lithium plating in lithium-ion cells** **E.P.49**

Martyna Smolarek, Michał Piszcz, Grażyna Łukowska, Natalia Izdebska,
Maciej Siekierski

Warsaw University of Technology, Faculty of Chemistry, Warsaw University of
Technology, Faculty of Chemistry, Warsaw University of Technology, Faculty of
Chemistry, Warsaw University of Technology, Faculty of Chemistry, Warsaw
University of Technology, Faculty of Chemistry

17:30 **Selection of methods for an assessment of the effect of additives used
in electrolytes for Li-Ion batteries** **E.P.50**

Natalia Izdebska, Michał, Piszcz, Martyna Smolarek, Anna Plewa-Marczewska

Warsaw University of Technology, Faculty of Chemistry, Warsaw University of Technology, Faculty of Chemistry, Warsaw University of Technology, Faculty of Chemistry, Tangram Battery Sp. z o.o.

- 17:30 **one-step sputter grown nanostructured metal nitride thin film electrode for electrochemical energy storage** **E.P.51**
Ravikant Adalati, Meenakshi Sharma, Ramesh Chandraa

Thin Film Laboratory, Institute Instrumentation Centre, Indian Institute of Technology Roorkee, Roorkee, 247667, India

- 17:30 **New cathode materials based on sulfur for new generations of high performance batteries** **E.P.52**

Luisa Roxana Mandoc¹, Violeta Niculescu¹, Athanosios Tiliakos¹, Stanica Enache¹, Amalia Soare¹, Raul Mitran², and Mihaela Buga¹

¹ - National Research and Development Institute for Cryogenics and Isotopic Technologies, Uzinei Street No. 4, Rm. Valcea, România, ² - Île Ilie Murgulescu Institute of Physical Chemistry, Romanian Academy of Sciences, Bucureşti, România

- 17:30 **Controlling pore structure parameters of nano-porous silica** **E.P.53**

Karl, M.*(1,2), Kalyakina, A.(2), Dräger, C.(2), Haufe, S.(2) Pokrant, S.(1)
(1)University of Salzburg, Austria (2)Wacker AG, Germany

- 17:30 **Technical Assessment of 2-Stage MH-Compressor Designs for Sector Coupling** **E.P.54**

Fleming, L.* (1,2), Puszkiel, J. (1,2), Kaufmann, T.F.J. (1,2), Gizer, G. (2), Bellost von Colbe, J.M. (2), Klassen, T. (1,2), Jepsen, J. (1,2)
(1)Institute for Materials Engineering, Helmut-Schmidt University, Holstenhofweg 85, 22043, Hamburg, Germany (2)Institute of Hydrogen Technology, Helmholtz-Zentrum Hereon, 21502, Geesthacht, Germany * lead presenter

17:30 **Polyimide Binder prepared by Eco-friendly Aqueous Synthetic Method with High Adhesive Properties for Silicon Anodes** **E.P.55**

Yujin So, Yu-Mi Ha, Jinsoo Kim, Hee-Tae Jung, Jong Chan Won, Myung-Hyun Ryou, Yun Ho Kim

Korea Research Institute of Chemical Technology (KRICT) / Korea Advanced Institute of Science and Technology (KAIST), Korea Research Institute of Chemical Technology (KRICT), Korea Research Institute of Chemical Technology (KRICT), Korea Advanced Institute of Science and Technology (KAIST), Korea Research Institute of Chemical Technology (KRICT), Department of Chemical and Biological Engineering, Hanbat National University, Korea Research Institute of Chemical Technology (KRICT)

17:30 **Textile-Based Co-MOF//FexSy/Graphene Energy Devices for Wearable Technologies** **E.P.56**

Oyku Cetin 1,*, Tufan Bolukbasi 1,*, Mete Batuhan Durukan 1,2, *, Gozde Ozturk 1and Husnu Emrah Unalan 1,2

1 - Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey 2 - Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey * - Equally Contributed

17:30 **Electrical and mechanical properties of ecofriendly polyimide films prepared by aqueous poly (amic acid) salt** **E.P.57**

Yu-Mi Ha, Yujin So, Sungmi Yoo, Yun Ho Kim, Jong Chan Won, Jinsoo Kim*

Korea Research Institute of Chemical Technology (KRICT), Korea Research Institute of Chemical Technology (KRICT), Korea Research Institute of Chemical Technology (KRICT), Korea Research Institute of Chemical Technology (KRICT), University of Science and Technology (UST), Korea Research Institute of Chemical Technology (KRICT), University of Science and Technology (UST), Korea Research Institute of Chemical Technology (KRICT)

- 17:30 **Ordered Double Transition Metal MAX Phases and their etching into MXenes: Synthesis and Electrochemical Studies** **E.P.58**
 Yaqoob Khan, Husnu Emrah Unalan
 Department of Metallurgical and Materials Engineering, Middle East Technical University, Ankara, 06800 Turkey
- 17:30 **Advanced angular correlation measurements from Scanning Electron Nanobeam Diffraction at the example of activated carbon** **E.P.59**
 Rebekka Klemmt, Espen Draht B  jesen
 Interdisciplinary Nanoscience Center, Aarhus University, Interdisciplinary Nanoscience Center, Aarhus University
- 17:30 **Highly crystalline γ -Fe₂O₃ Nano-cubes with enhance electrochemical Performance for Supercapacitors** **E.P.60**
 Umisha Singh^{1*}, Karthik Kiran Sarigamala¹, and Shobha Shukla², Sumit Saxena²

 1Umishasinghiitb@gmail.com, Centre for Research in Nanotechnology and Science, Indian Institute of Technology Bombay, Mumbai, MH, India-400076.
 2Nanostructures Engineering and Modelling Laboratory, Department of Metallurgical Engineering and Material Science, Indian Institute of Technology Bombay, Mumbai, MH, India-400076.
- 17:30 **An examination of lithium amide synthesis as a solid-state hydrogen storage material** **E.P.61**
 Agata Baran, Marek Pola  ski

 Department of Structural Materials, Faculty of New Technologies and Chemistry, Military University of Technology, 2 Kaliskiego Str., Warsaw, 00-908, Poland, Department of Functional Materials and Hydrogen Technology, Faculty of New Technologies and Chemistry, Military University of Technology, 2 Kaliskiego Str., Warsaw, 00-908, Poland.
- 17:30 **Vanadium Interpolated ZIF-67 MOF Composite for Augmented Asymmetric Solid-State 1.4V Supercapacitor Energy Storage** **E.P.62**

Monojit Mondal, Dipak Kumar Goswami, Tarun Kanti Bhattacharyya

School of Nano Science and Technology, IIT Kharagpur, Kharagpur, INDIA-721302, Department of Physics, IIT Kharagpur, Kharagpur, INDIA-721302, Department of Electronics and Electrical Communication Engineering, IIT Kharagpur, Kharagpur, INDIA-721302

- 17:30 **Liquid crystal as ion conductor in solid polymer electrolytes for lithium metal batteries** **E.P.63**
Isaac Álvarez Moisés, Jean-François Gohy
Catholic university of Louvain

TUESDAY, 20 SEPTEMBER 2022

Solid-state batteries : Arndt Remhof

- 9:00 **Cost-Effective Na⁺ Halide Superionic Conductors for All-Solid-State Batteries** **E.05.01**
Juhyoun Park, Hiram Kwak, Yeji Choi, Yoon Seok Jung

- Department of Chemical and Biomolecular Engineering, Yonsei University
9:30 **Halide solid electrolytes - Structure and properties** **E.05.02**
Eveline van der Maas, Swapna Ganapathy, Marnix Wagemaker
Delft university of technology

- 9:45 **Effect of current density on solid electrolyte interphase evolution in anode-free all-solid-state next-generation Li ion batteries** **E.05.03**
Sudarshan Narayanan, Mauro Pasta
Department of Materials, University of Oxford, Parks Road, Oxford OX1 3PH, United Kingdom

- 10:00 **Scalable preparation of functional nanostructured hybrids of transition metal sulfide/oxide for high performance supercapacitors** **E.05.04**
Sunil Lonkar*, Chiara Busa, Vincenzo Giannini

Advanced Materials Research Center Technology Innovation Institute PO Box: 9639 Masdar City, Abu Dhabi, UAE

- 10:15 **Coffee break**

Solid-state batteries : Montserrat Casas-Cabanas

- 11:00 **Solid state batteries based on metal hydride electrolytes** **E.06.01**
 Petra de Jongh, Valerio Gulino, Peter Ngene
 Materials Chemistry and Catalysis, Debye Institute for Nanomaterials Science,
 Utrecht University, The Netherlands, P.E.deJongh@uu.nl
- 11:30 **Pressure induced phase segregation and conductivity correlation of highly conductive closo-hydridoborate electrolyte** **E.06.02**
 YuanYe Huang, Arndt Remhof, Radovan Šerňák, Corsin Battaglia
 Empa, Swiss Federal Laboratories for Materials Science and Technology,
 Ueberlandstrasse 129, 8600, Dübendorf, Switzerland, DQMP, University of
 Geneva, Quai Ernest-Ansermet 24, 1211, Geneva, Switzerland
- 11:45 **Metastable NaCB₁₁H₁₂ polymorph prepared by mechanical milling as new superionic conductor for post-Li solid-state batteries** **E.06.03**
 Fabrizio Murgia,¹ Matteo Brighi,¹ Laura Piveteau,² Claudia E. Avalos,² Valerio Gulino,³ Marc C. Nierstenhauer,⁴ Laura Caggia,¹ Peter Ngene,³ Petra de Jongh³ and Radovan Šerňák¹
¹Laboratory of Crystallography, Department of Quantum Matter Physics, University of Geneva, Quai Ernest-Ansermet 24, CH-1211 Geneva, Switzerland
²Institute of Chemical Sciences and Engineering, NMR Platform, Ecole Polytechnique Fédérale de Lausanne, Station 6, CH-1015 Lausanne, Switzerland
³Materials Chemistry and Catalysis, Debye Institute for Nanomaterials Science, Utrecht University, 3584 CG Utrecht, The Netherlands
⁴Fakultät für Mathematik und Naturwissenschaften, Anorganische Chemie, Bergische Universität Wuppertal, Gaußstr. 20, 42119 Wuppertal, Germany
- 12:00 **Cyclic carbonate-bearing Carbonated Soybean oil composite with Polyethylene oxide as solid polymer electrolyte** **E.06.04**
 Ashish Raj, Bruno Grignard, Christophe Detrembleur, Jean-François Gohy

Institute of Condensed Matter and Nanoscience (IMCN), UCLouvain, Place L. Pasteur 1, 1348 Louvain-la-Neuve, Belgium. Center for Education and Research on Macromolecules (CERM), CESAM Research Unit, University of Liège, Allée du 6 août, Building B6A, 4000 Liège, Belgium

12:15 **Lunch break**

Carbon- and silicon-based materials for batteries and supercapacitors : Petra de Jongh

14:00 **Glass-Based Electrodes for Lithium/Sodium-Ion Batteries** **E.07.01**

Yuanzheng Yue

Department of Chemistry and Bioscience, Aalborg University, 9220 Aalborg, Denmark

14:30 **Silicon Nanowires Grown on a Stainless Steel Fiber Cloth as a Flexible and Robust Anode for Lithium-Ion Batteries** **E.07.02**

Sumair Imtiaz, Ibrahim Saana Amiinu, Tadhg Kennedy, Kevin M. Ryan
University of Limerick

14:45 **Fabrication of Microspheres of Nanoporous Si for Anodes of Lithium-Ion Batteries** **E.07.03**

K.-H. Heinig¹, H.-J. Engelmann¹, O. Andersen², R. Hauser², D. Tuchsolski¹, C. Gerking³, S. Lindow³, A. Almousli⁴

¹ Helmholtz-Zentrum Dresden-Rossendorf (HZDR), D-01328 Dresden, Germany,
² Fraunhofer IFAM, D-01277 Dresden, Germany, ³ NANOVAL GmbH & Co. KG, D-13403 Berlin, Germany, ⁴ Custom Cells GmbH, D-25524 Itzehoe, Germany

15:00 **Decoration with cobalt hexacyanoferrate nanocubes of carbon-silicon as hybrid electrode for high-performance supercapacitors** **E.07.05**

Marius C. Stoian*, Irina-Nicoleta Bratosin*, Cosmin Romanitan*, Gabriel Craciun*, Nikolay Djourellov**, Mihaela Kusko*, Antonio Radoi*

15:15 Coffee break

1School of Nanoscience and Technology, Indian Institute of Technology
Kharagpur, Kharagpur 721302, India, 2 Department of Physics, Indian Institute
of Technology Kharagpur, Kharagpur 721302, India

17:00 **Ionic liquid-silica composites for CO₂ capture and utilization** **E.08.04**

Marieke van Leeuwen, Rahul Maity, Nina Plankensteiner, Matias Jobaggy, Joeri
F.M. Denayer, Philippe M. Vereecken

imec and KU-Leuven, Leuven, Belgium, Department of Chemical Engineering,
Vrije Universiteit Brussel, Belgium, imec, Leuven, Belgium, imec, Leuven,
Belgium, Department of Chemical Engineering, Vrije Universiteit Brussel,
Belgium, imec and KU-Leuven, Leuven, Belgium

17:15 **Aqueous all copper redox flow battery for sustainable electrochemical
energy storage** **E.08.05**

Wouter Dirk Badenhorst, Kuldeep, Laura Sanz, Catia Arbizzani, Lasse
Murtomäki

Wouter Dirk Badenhorst, Kuldeep, Lasse Murtomäki, Department of Chemistry
and Materials Science, School of Chemical Engineering, Aalto University, PO Box
16100, 00076 AALTO, Finland. Laura Sanz, Nvision System & Technologies
S.L, Avenida Barcelona (ed ig nova Tecnoespaí), 105 - DESP 8, Igualada, 08700,
Barcelona, Spain. Catia Arbizzani, Alma Mater Studiorum - University of
Bologna, Dept. of Chemistry ‘Giacomo Ciamician’, Via F. Selmi 2, 40126
Bologna, Italy.

WEDNESDAY, 21 SEPTMEBER 2022

Advanced methods for characterization of energy materials : Marek Polanski

EXPLORING ENERGY STORAGE MATERIALS THROUGH SOLID STATE

14:00 **NMR** **E.09.01**

S. Bordignon, C. Pistidda, T. T. Le, M. R. Chierotti

Università degli Studi di Torino, Department of Chemistry and NIS Centre,
via P. Giuria 7, 10125, Torino, Italy Institute of Hydrogen Technology,
Helmholtz-Zentrum hereon GmbH, Max-Planck-Straße 1, D-21502 Geesthacht,
Germany

- Utilizing the novel tools of "PDF in the cloud"™ for PDF analysis:
the case of TiO₂-bronze nanocrystals for Li-ion batteries** **E.09.02**
14:30 Martin A. Karlsen, Jonathan De Roo, Simon J. L. Billinge, and Dorthe B. Ravnsbæk
Department of Physics, Chemistry, and Pharmacy, University of Southern Denmark, Campusvej 55, 5230 Odense M, Denmark. Department of Chemistry, University of Basel, St. Johannis-Ring 19, 4056 Basel, Switzerland. Department of Applied Physics and Applied Mathematics, Columbia University, 500 W 120th St, New York, NY 10027, USA. Department of Chemistry, Aarhus University, Langelandsgade 140, 8000 Aarhus C, Denmark.
- Experimental study and thermodynamic assessment of the LiBH₄-LiI pseudo-binary system** **E.09.03**
14:45 Erika Michela Dematteis (a), Asya Mazzucco (a), Valerio Gulino (a-b), Marta Corno (a), Mauro Palumbo (a), Marcello Baricco (a)
(a) Department of Chemistry, Inter-departmental Center Nanostructured Interfaces and Surfaces (NIS), and INSTM, University of Turin, Via Pietro Giuria 7, 10125 Torino, Italy, (b) Materials Chemistry and Catalysis, Debye Institute for Nanomaterials Science, Utrecht University, Universiteitsweg 99, 3584 CG, Utrecht, The Netherlands
- Modelling recipes for high-throughput ab-initio screening of metal hydrides** **E.09.04**
15:00 Kai Sellschopp, Paul Jerabek
Institute of Hydrogen Technology, Helmholtz-Zentrum Hereon, Geesthacht, Germany
- Multi-scale Modeling of Metal Hydride Materials: Computational Methods and Use Cases for Hydrogen Storage Application** **E.09.06**
15:15 Paul Jerabek, Brandon Wood, Tae Wook Heo, Sally Brooker
Institute of Hydrogen Technology, Helmholtz-Zentrum Hereon, Geesthacht, Germany Materials Science Division, Lawrence Livermore National Laboratory, Livermore, USA Department of Chemistry, University of Otago, Dunedin, New Zealand

15:30 **Coffee break**

Using light and heat as energy vectors : Michele Remo Chierotti

16:00 **Design and characterization of integrated systems for solar fuel production** **E.10.01**

Francesca M. Toma

Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94577

16:30 **Influence of the cyclability on the structural and thermophysical properties of LiNaSO₄ for thermal energy storage** **E.10.03**

Maria Teresa, Cristina Luengo, Stefania Doppiu, Elena Palomo

CIC energigune, Parque Tecnológico de Álava, Albert Einstein 48, 01510, Vitoria-Gasteiz, Spain

16:45 **Energy Storage Rocks: Metal Carbonates as Thermochemical Energy Storage Materials** **E.10.04**

K. Williamson¹, K.T. Møller², A.M. D'Amico³, T.D. Humphries¹, M. Paskevicius¹, C.E. Buckley¹

¹ Department of Physics and Astronomy, Curtin University, Kent St, Bentley, WA 6102, Australia , ² Department of Biological and Chemical Engineering, Aarhus University, Aabogade 40, Aarhus, DK-8200, Denmark, ³ Australian Synchrotron, 800 Blackburn Rd, Clayton, VIC 3168, Australia

17:00 **Photo-Enhanced Magnesium-Ion Capacitors using Vanadium Dioxide Electrodes** **E.10.05**

Sul Ki Park, Buddha Deka Boruah, Arvind Pujari and Michael De Volder

Department of Engineering, University of Cambridge, Cambridge CB3 0FS, UK

THURSDAY, 22 SEPTEMBER 2022

Hydrogen storage : Erika Michela Dematteis

9:00 **Green Hydrogen in NZ and the German-NZ Green Hydrogen network** **E.11.01**

Paul Jerabek, Sally Brooker

Paul Jerabek, Helmholtz Zentrum hereon, Germany, Sally Brooker, University of Otago, New Zealand

9:30 **Numerical evaluation of a 2-stage MH-compressor based on AB2 alloys for electrolyzer coupling** **E.11.03**

Kaufmann, T. F. J.* (1,2), Puszkiel, J. (1,2), Fleming, L. (1,2), Gizer, G. (2), Bellosta von Colbe, J.M.(2), Klassen, T. (1,2), Jepsen, J. (1,2)

(1) Faculty of Mechanical Engineering, Institute of Materials Engineering, Helmut-Schmidt-University, Holstenhofweg 85, 22043, Hamburg, Germany (2) Institute of Hydrogen Technology, Helmholtz-Zentrum Hereon, Max-Planck-Straße 1, 21502 Geesthacht, Germany * lead presenter

9:45 **High-pressure hydrogen (un-)loading station for sample syntheses and PXRD investigations** **E.11.04**

O. Metz a, G. Gizer a, Y. Shang a, J. Stolzenberger a, T. Klassen a,b , M. Dornheim a, C. Pistidda a

a Hydrogen Technology Institute, Helmholtz-Zentrum hereon GmbH, Max-Planck-Straße 1, 21502 Geesthacht, Germany b Institute of Materials Technology, Helmut-Schmidt-University, University of the Federal Armed Forces, Holstenhofweg 85, 22043 Hamburg

10:00 **Recycling of used solid oxide fuel/electrolyser cell components and conductivity level of recovered materials** **E.11.05**

Gudaysew T. YENESEW Eric QUAREZ Annie LE GAL LA SALLE Clément NICOLLET Olivier JOUBERT

Not available

10:15 **Coffee break**

Hydrogen storage : Claudio Pistidda

11:00 **Extreme mechanochemistry - high temperature and pressure reactive ball milling.** **E.12.01**

Marek Polański, Agata Baran

Military University of Technology, 2 Kaliskiego Str., Warsaw, 00-908, Poland

11:30 **Developing a quantitative-based phase-field model for the FeTi hydrogenation.** **E.12.02**

Ebert Alvares, Kai Sellschopp, Tae Wook Heo, Paul Jerabek

Institute of Hydrogen Technology, Helmholtz-Zentrum Hereon, Geesthacht, Germany, Institute of Hydrogen Technology, Helmholtz-Zentrum Hereon, Geesthacht, Germany, Materials Science Division, Lawrence Livermore National Laboratory, Livermore, USA, Institute of Hydrogen Technology, Helmholtz-Zentrum Hereon, Geesthacht, Germany

11:45 **Assessment of the hydrogen absorption/desorption properties of AB₂-hydride forming alloy in an industrial amount: Design of scal** **E.12.03**

Fleming, L. (1,2)*, Puszkiel, J. (1,2), Warfsmann, J. (1,2), Passing, M. (2), Krause, P. (1,2), Wienken, E. (1,2), Kaufmann, T. (1,2), Covarrubias Guarneros, M. (1,2), Bellosta von Colbe, J.M. (2), Klassen, T. (1,2), Jepsen, J. (1,2)

(1) Faculty of Mechanical Engineering, Institute of Materials Engineering, Helmut-Schmidt-University, Holstenhofweg 85, 22043, Hamburg, Germany (2) Institute of Hydrogen Technology, Helmholtz-Zentrum Hereon, Max-Planck-Straße 1, 21502 Geesthacht, Germany * lead presenter

12:00 **Sustainable NaAlH₄ production from recycled automotive Al alloy** **E.12.04**

Yuanyuan Shang (a), Claudio Pistidda (*a), Chiara Milanese (b), Alessandro Girella (b), Alexander SchÄ¶kel (c), Thi Thu Le (a), Annbritt Hagenah (a), Oliver Metz (a), Thomas Klassen (a, d), Martin Dornheim (a)

a Department of Materials Design, Institute of Hydrogen Technology, Helmholtz-Zentrum hereon GmbH, Max-Planck-Straße 1, 21502 Geesthacht, Germany. E-mail: claudio.pistidda@hereon.de b C.S.G.I. & Department of Chemistry, Physical Chemistry Section, University of Pavia, Viale Taramelli 16, 27100 Pavia, Italy c Deutsches Elektronen-Synchrotron DESY, Notkestr. 85, 22607 Hamburg, Germany dHelmut Schmidt University, Holstenhofweg 85, 22043 Hamburg, Germany

12:15 **Catalysts for reversible hydride decomposition** **E.12.05**

Ivan Saldan, Serhii Tkachenko, Ladislav ĀŠelko, Jan M. MacĀřk

Central European Institute of Technology, Brno University of Technology,
PurkyĀova 123, 61200 Brno, Czech Republic Center of Materials and
Nanotechnologies, Faculty of Chemical Technology, University of Pardubice,
Nam. Cs. Legii 565, 530 02 Pardubice, Czech Republic

IBM Research Europe



Symposium R

Sessions: Room 101| MINI Building

Poster Session: Small Hall| Main Building

Functional materials:

Integration of advanced materials on silicon: from classical to neuromorphic and quantum applications

Symposium Organizers: **Abderraouf BOUCHERIF** University of Sherbrooke Canada

Andriy HIKAVYY IMEC Belgium

Cezar ZOTA IBM Research GmbH Switzerland

Monica DE SETA University Roma Tre Italy

Symposium R Program

MONDAY, 19 SEPTEMBER 2022

III-V Materials : Cezar Zota

- 14:00 **Atomic step flow in a limited area: in situ observation of GaAs nanowire growth in a transmission electron microscope** **R.01.01**
G Patriarche
Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, 91120, Palaiseau, France.
- 14:30 **Electrodeposition approach for fabrication of In-based semiconductors on silicon** **R.01.02**
Katarzyna E. Hnida-Gut (1,2), Marilyne Sousa (2), Preksha Tiwari (2,3), Heinz Schmid (2)

(1) IHP Leibniz Institute for High Performance Microelektronics –, Frankfurt (Oder), Germany, (2) IBM Research Europe –, Zurich, Zurich, Switzerland, (3) Polariton Technologies, Zurich, Switzerland
- 15:00 **Optoelectronic properties of GaAs(Sb)-AlGaAs core-shell NW diodes on silicon** **R.01.03**
Tobias Schreitmüller, Patrick Jong, Daniel Ruhstorfer, Akhil Ajay, Andreas Thurn, Jonathan J. Finley, and Gregor Koblmüller
Walter Schottky Institute, Technical University of Munich, 85748 Garching, Germany
- 15:15 **In-Situ TEM Observation of GaAs Nanowire Nucleation on Si** **R.01.04**
Chen Wei, Laurent Travers, Julien Chaste, Cl  ophanie Brochard, Andrea Cattoni, David Bouville, Etienne Herth, Jean-Christophe Harmand, Federico Panciera
Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, 91120, Palaiseau, France.
- 15:30 **Coffee break**

Materials and devices for quantum computing : Abderraouf Boucherif

- 16:00 **Electrically Active Defects in MOS Systems and Their Relevance to Quantum Computation** **R.02.01**

Karim Cherkaoui 1, Luca Larcher 2, Andrea Padovani 2, Enrico Caruso 3, Erik Lind 4, Lars-Erik Wernersson 4, Johannes Svensson 4, Jun Lin 1, Scott Monaghan 1 and Paul K Hurley 1

1 Tyndall National Institute, University College Cork, Ireland, 2 Applied Materials Italia Srl, Via Ruini, 74/L 42122 Reggio Emilia (RE) Italy, 3 Infineon Technologies, Villach, Austria, 4 Lund University, Lund, Sweden

16:30 **Fully depleted silicon-on-insulator transistors for quantum applications** **R.02.02**

Philippe Ferrandis (1), Thomas Bäcker (2), Mikael Cassé (2)

(1) Université de Toulon, Univ. Grenoble Alpes, CNRS, Institut Néel, 38000 Grenoble, France (2) CEA, LETI, Univ. Grenoble Alpes, 38000 Grenoble, France

16:45 **Germanium quantum wells for spin qubit applications** **R.02.03**

Stefano Calcaterra, Daniel Chrastina, Giovanni Isella, Andrea Ballabio, Giulio Tavani, Daniel Jirovec, Jaime Saez, Juan Aguilera, Georgios Katsaros
L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, Institute of Science and Technology Austria, Am Campus 1, 3400 Klosterneuburg, Austria, Institute of Science and Technology Austria, Am Campus 1, 3400 Klosterneuburg, Austria, Institute of Science and Technology Austria, Am Campus 1, 3400 Klosterneuburg, Austria, Institute of Science and Technology Austria, Am Campus 1, 3400 Klosterneuburg, Austria,

17:00 **Ohmic Nb Contacts for Cryogenic InP HEMTs** **R.02.04**

Linnea Bendrot, Eunjung Cha, Cezar Zota
IBM Research Europe - Ruschlikon, Switzerland

17:15 **Quantitative strain mapping by X-ray nanobeam diffraction in Si/SiGe electron spin qubit devices** **R.02.05**

C. Corley-Wiciak [1], C. Richter [2], M.H. Zoellner [1], C. Hsun[2], K. Anand [1], I. Zaitsev [1], C. Manganelli [1], A. A. Corley-Wiciak [1], Y. Yamamoto [1], E. Zatterin [3] , T. Schuelli [3], F. Reichmann [1], L. Schreiber [4] ,W. Langheinrich [5], W. M. Klesse [1], M. Virgilio [6], G. Capellini [1,7]

[1] IHP - Leibniz-Institut für innovative Mikroelektronik, Frankfurt(Oder), Germany [2] IKZ - Leibniz-Institut für Kristallzüchtung, Berlin, Germany [3] ESRF, Grenoble, France [4] JARA Institute for Quantum Information, RWTH Aachen, Germany [5] Infineon Technologies Dresden GmbH&Co.KG, Dresden, Germany [6] Università di Pisa, Pisa, Italy [7] Dipartimento di Scienze, Università Roma Tre, Roma, Italy

Poster session : -

- | | | |
|-------|--|--------------|
| 17:30 | <p>Demonstration of a diagonal shorted self-rectifying memristive crossbar array for performing graph algorithms</p> <p>Janguk Han, Yoon Ho Jang, Jihun Kim, Woohyun Kim, Cheol Seong Hwang</p> <p>Department of Materials Science and Engineering and Inter-university Semiconductor Research Center, College of Engineering, Seoul National University, Seoul, 08826, Republic of Korea</p> | R.P.1 |
| 17:30 | <p>Time series data processing using non-volatile memristor-based temporal kernel</p> <p>Yoon Ho Jang, Sung Keun Shim, Janguk Han, Jihun Kim, Woohyun Kim, Cheol Seong Hwang</p> <p>Department of Materials Science and Engineering and Inter-university Semiconductor Research Center, College of Engineering, Seoul National University, Seoul, 08826, Republic of Korea</p> | R.P.2 |
| 17:30 | <p>integration of advanced materials on silicon: from classical to neuromorphic and quantum application</p> <p>Park Jinuk, Park Jin-Hong</p> <p>Semiconductor and Display Engineering Dept, Department of Electronics and Computer Engineering</p> | R.P.3 |

17:30 **Alternating-current near-infrared electroluminescence from Ga₂O₃:Cr³⁺ oxide film in metal-oxide-silicon structure** **R.P.4**

Gyeongdo Baek, Jingi Gim, Sanghyeon Lim, Hyunjee Jung, Mohammad M. Afandi, Jehong Park, Jongsu Kim

Department of Display Science and Engineering, Pukyong National University

17:30 **Alternating-current green-yellow electroluminescence from Zn₂SiO₄:Mn²⁺ biphasic film in metal-oxide-silicon structure** **R.P.5**

Sanghyeon Lim, Jingi Gim, Gyeongdo Baek, Hyunjee Jung, Mohammad M. Afandi, Jehong Park, Jongsu Kim

Department of Display Science and Engineering, Pukyong National University

17:30 **UV light stability test of c-Si photovoltaic EVA encapsulant modified by organic downshifting additive** **R.P.6**

Krunoslav Juraić (1), Davor Gracin (1), Marija Ivezić (1), Ivan Vadla (2)

(1) Ruđer Bošković Institute, Bijenička cesta 54, 10000 Zagreb, Croatia (2) Solvis Ltd. Ulica Vesne Parun 15, Varaždin, Croatia

TUESDAY, 20 SEPTEMBER 2022

Applied materials : Gilles Patriarche

9:00 **III-Nitrides hetero-epitaxy and applications** **R.03.01**

Yvon CORDIER
Université Côte d'Azur, CNRS, CRHEA

9:30 **Oxide coatings for gravitational wave mirrors** **R.03.02**

Jean-Pierre Locquet
Katholieke Universiteit Leuven, Semiconductor Physics, Celestijnenlaan 200d, 3001 Leuven, Belgium

10:00 **Metal-Dielectric-Metal Cavities acting as Photonic Quantum Wells for Light Emission Enhancement** **R.03.03**

Roman Krahne,^{1,*} Vincenzo Caligiuri,² Aniket Patra,² Renuka Pothuraju,¹ and Antonio De Luca²

¹ Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy ² Dipartimento di Fisica, Università della Calabria, 87036 Rende, and CNR-Nanotec, Italy

10:15 **Ge-based Plasmonic Antenna made of Ultra-high doped Ge for biosensing in the THz range** **R.03.04**

Elena Hardt(1), Carlos Alvarado Chavarin(1), Soenke Gruessing(2), Julia Flesch(3), Oliver Skibitzki(1), Davide Spirito(1), Gian Marco Vita(4), Giovanna De Simone(4), Alessandra di Masi(4), Changjiang You(3), Bernd Witzigmann(5), Jacob Piehler(3), and Giovanni Capellini(1,4)

(1)IHP - Leibniz Institut für innovative Mikroelektronik, Im Technologiepark 25, 15236 Frankfurt (Oder),Germany (2)University of Kassel, Wilhelmshoeher Allee 71, 34121 Kassel, Germany (3)University of Osnabrueck, Barbarastrasse 11, 49076 Osnabrueck, Germany (4)Department of Sciences, Università Roma Tre, Viale G. Marconi 446, 00156, Roma, Italy (5)Friedrich-Alexander Universität Erlangen-Nürnberg, Konrad-Zuse Str. 3/5, 91052 Erlangen, Germany

10:30 **Coffee break**

Advanced heterogeneous integration : Shimura Yosuke

11:00 **Advanced heterogeneous integration and edge computing enabled by remote epitaxy** **R.04.01**

Jeehwan Kim
MIT

11:30 **Back-gated plasma enhanced ALD amorphous gallium-oxide thin film transistors for BEOL integration** **R.04.02**

Charlotte Van Dijck, Florian Maudet, Sourish Banerjee, Veeresh Deshpande, Catherine Dubourdieu

Helmholtz-Zentrum-Berlin für Materialien und Energy, Freie Universität Berlin, Helmholtz-Zentrum-Berlin für Materialien und Energy, Helmholtz-Zentrum-Berlin für Materialien und Energy, Helmholtz-Zentrum-Berlin für Materialien und Energy, Helmholtz-Zentrum-Berlin für Materialien und Energy, Freie Universität Berlin

11:45 **Spin-orbitronics at a topological insulator/semiconductor interface** **R.04.04**

C. Zucchetti(1), T. Guillet(2), A. Marchionni(1), A. Hallal(2), P. Biagioni(1), C. Vergnaud(2), A. Marty(2), H. Okuno(3), A. Masseboeuf(2), M. Finazzi(1), F. Ciccacci(1), M. Chshiev(2), F. Bottegoni(1), M. Jamet(2)

(1) LNESS-Dipartimento di Fisica, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133, Milano, Italy (2) Université Grenoble Alpes, CEA, CNRS, Grenoble INP, IRIG-Spintec, 38000 Grenoble, France (3) Université Grenoble Alpes, CEA, IRIG-MEM, 38000 Grenoble, France

12:00 **Defect free strain relaxation of microcrystals on mesoporous patterned silicon**

R.04.05

Heintz, A. (1,2), Ilahi, B. (1,2), Pofelski, A. (4), Botton, G. A. (4,5), Patriarche, G. (6), Barzaghi, A. (3), Fafard, S. (1,2), ArÅ's, R. (1,2), Isella, G. (3), Boucherif, A. (1,2)

1 Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 3000 Boulevard Université, Sherbrooke J1K OA5 QC, Canada 2 Laboratoire Nanotechnologies Nanosystèmes (LN2) CNRS UMI-3463, Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 3000 Boulevard Université, Sherbrooke J1K OA5 QC, Canada 3 L-NESS and Dipartimento di Fisica, Politecnico di Milano, Via Anzani 42, I-22100 Como, Italy 4 Department of Materials Science and Engineering, McMaster University, Hamilton, ON L8S 4M1, Canada 5 Canadian Light Source, 44 Innovation Boulevard, Saskatoon, SK S7N 2V3 Canada 6 Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, C2N Marcoussis, 91460 Marcoussis, France *Corresponding author. Email: alexandre.heintz@usherbrooke.ca, abderraouf.boucherif@usherbrooke.ca

12:15 **Lunch break**

Group IV optoelectronics : Andriy Hikavyi

14:00 **Integrated mid-infrared photonics with germanium quantum wells**

R.05.01

Andrea Barzaghi, Virginia Falcone, Stefano Calcaterra, Raffaele Giani, Andrea Ballabio, Giovanni Isella, Daniel Chrastina, Michele Ortolani, Michele Virgilio, Jacopo Frigerio.

14:30 **High-quality n-type Ge/SiGe quantum cascade heterostructures grown by UHV-CVD on Si and SOI substrates** **R.05.02**

1 Dipartimento di Scienze, Università Roma Tre, Roma 00146, Italy, 2 Dipartimento di Fisica, Sapienza Università di Roma, Roma 00185, Italy, 3 IHP-Leibniz Institut für innovative Mikroelektronik, Frankfurt (Oder) 15236, Germany, 4 Dipartimento di Fisica E. Fermi, Università di Pisa, Pisa 56127, Italy, *contact email: luciana.digaspares@uniroma3.it

14:45 **Intersubband Absorption in p-type Ge Multiple Quantum Wells for Mid-IR Sensing Applications** **R.05.03**

L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32
20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza
Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica,
Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS,
Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133
Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza
Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica,
Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS,
Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133
Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza

Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy

15:00 **Impact of substrate doping on the performance of vertically illuminated Ge-on-Si photodetectors** **R.05.04**

Raffaele Giani, Stefano Calcaterra, Andrea Barzaghi, Andrea Ballabio, Jacopo Frigerio, Giovanni Isella

L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy, L-NESS, Dipartimento di Fisica, Politecnico di Milano, P.zza Leonardo da Vinci, 32 20133 Milano, Italy

15:15 **Polarized and thermal dependent Raman scattering study of epitaxially growth GeSn layers with various Sn content** **R.05.05**

Agnieszka Anna Corley-Wiciak¹, Davide Spirito¹, Omar Concepci  n², Marvin Hartwig Zoellner¹, Diana Ryzhak¹, Detlev Gr  ltzmacher², Dan Buca², Giovanni Capellini^{1&3}

¹IHP    Leibniz-Institut f  r innovative Mikroelektronik, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany, ²Peter Gr  nberg Institute 9 (PGI-9) and JARA-Fundamentals of Future Information Technologies (JARA- FIT), Forschungszentrum J  lich, 52425 J  lich, Germany, ³Dipartimento di Scienze, Universit   Roma Tre, V.le G. Marconi 446, 00146 Roma, Italy,

15:30 **Coffee break**

Group IV materials : Monica De Seta

16:00 **Sn-nanodots mediated growth for poly-Si_{1-x-y}GexSny layers** **R.06.01**

Yosuke Shimura^{1,2,*} Masaki Okado¹, Junya Utsumi¹, Kako Iwamoto¹, Ryo Yokogawa^{3,4}, Motohiro Tomita⁵, Atsushi Ogura^{3,4}, Hiroshi Uchiyama⁶, Hirokazu Tatsuoka¹

1 Shizuoka University (Japan), 2 Research Institute of Electronics Shizuoka University (Japan), 3 Meiji University (Japan), 4 Meiji Renewable Energy laboratory (Japan), 5 Waseda University (Japan), 6 JASRI (Japan) *Currently at imec (Belgium)

16:30 **Low temperature growth and properties of highly B doped SiGe epitaxial layers** **R.06.02**

Andriy Hikavyy, Sydney Eronmhonse, Clement Porret, Roger Loo
Imec, Kapeldreef 75, 3000 Leuven, Belgium: Technological University Dublin, Park House, 191, Co. Dublin, Ireland

16:45 **Insights into the Modification of the Ge(001) Electronic Structure after Adsorption and Incorporation of Sn** **R.06.03**

Felix Reichmann(1), Andreas P. Becker(1), Emily V. S. Hofmann(1)(2)(3), Neil J. Curson(2)(3), Wolfgang M. Klesse(1) and Giovanni Capellini(1)(4)

(1)IHP – Leibniz-Institut für innovative Mikroelektronik, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany (2)London Centre for Nanotechnology, University College London, 17-19 Gordon Street, London, WC1H 0AH, UK (3)Department of Electronic and Electrical Engineering, University College London, London, WC1E 7JE, UK (4)Dipartimento di Scienze, Università Roma Tre, V.le G. Marconi 446, I-00146 Rome, Italy

17:00 **Si/(Si)Ge heterostructures grown via low-temperature molecular beam epitaxy as building blocks for novel device concepts** **R.06.04**

A. Salomon, J. Aberl, L. Vukušić, M. Hauser, J. Schuster, T. Fromherz, M. Brehm

Institute of Semiconductor and Solid-State Physics, Johannes Kepler University Linz, Altenbergerstr. 69, A-4040 Linz, Austria

17:15 **TiN plasmonic nanohole arrays for CMOS-compatible integrated refractive index sensing** **R.06.05**

Sebastian Reiter (1), Weijia Han (1), Christian Mai (2), Davide Spirito (2), Josmy Jose (2), Christian Wenger (2), Inga A. Fischer (1)

1 Experimental Physics and Functional Materials, Brandenburgische Technische Universität Cottbus-Senftenberg, Erich-Weinert-Straße 1, 03046 Cottbus, Germany, 2 IHP – Leibniz-Institut für innovative Mikroelektronik, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany

17:30 **Selective SiGe Vapor Etching Using Br₂ in View of Nanosheet Device Isolation** **R.06.06**

Roger Loo 1, Nicolas Gosset 2, Megumi Isaji 2, Yumi Ikeda Kawamura 2, Andriy Hikavyi 1, Erik Rosseel 1, Clement Porret 1, Ankit Nalin Mehta 1, and Jean-Marc Girard 3

1 Imec, Kapeldreef 75, 3000 Leuven, Belgium , 2 Air Liquide Laboratories, Innovation Campus Tokyo, 2-2 Hikarinooka, Yokosuka, Kanagawa 239-0847 Japan , 3 Air Liquide Advanced Materials, 75 quai d'Orsay, 75007 Paris (France)

WEDNESDAY, 21 SEPTEMBER 2022

Neuromorphic devices and materials : N/A

14:00 **Artificial synapses enabled by ferroelectric Schottky barrier transistors** **R.07.01**

Qing-Tai Zhao, Fengben Xi, Andreas Grenmyr, Jiayuan Zhang, Yi Han, Jin Hee Bae, Detlev Grützmacher

Peter Grünberg Institute (PGI 9) and JARA-Fundamentals of Future Information Technologies, Forschungszentrum Jülich GmbH, 52428 Jülich, Germany

14:30 **Structural plasticity with PEDOT:PSS electropolymerized dendritic fibers** **R.07.02**

Kamila Janzakova, Ismael Balafrej, Ankush Kumar, Nikhil Garg, Sebastien Pecqueur, Yannick Coffinier, Fabien Alibert

Institut Of Electronic, Microelectronic and Nanotechnology (IEMN), UMR 8520-CNRS, Université de Lille, Villeneuve d'Ascq, France Laboratoire Nanotechnologies Nanosystemes (LN2), IRL 3463-CNRS, Université de Sherbrooke, Sherbrooke QC, Canada

15:00 **Interface engineering for vanadium dioxide (VO₂) integration on silicon** **R.07.03**

Swayam Prakash Sahoo[a,b,c], Alexandre Juneauâ€Fecteau[b,c], Anne Lamirand[a], Victor Pierron[d], Laurence MÃ©chin[d], Luc G. FrÃ©chette[b,c], Bertrand Vilquin[a,b]

[a]. Univ Lyon, Ecole Centrale Lyon, INSA Lyon, UCBL, CPE Lyon, CNRS, Institut des Nanotechnologies de Lyon, UMR5270, 69130 Ecully, France [b]. Institut Interdisciplinaire dâ€™Innovation Technologique (3IT), UniversitÃ© de Sherbrooke, Sherbrooke, QC J1K 0A5, Canada [c]. Laboratoire Nanotechnologies NanosystÃ©mes (LN2) - CNRS UMI-3463, UniversitÃ© de Sherbrooke, Sherbrooke, QC J1K 0A5, Canada [d]. Normandie Univ, UNICAEN, ENSICAEN, CNRS, GREYC (UMR 6072), 14000 Caen, France

15:15 **Comparing electrode reservoir performance in silicon oxide ReRAM devices using high sensitivity SIMS analysis of oxygen movement** **R.07.04**
H.R.J. Cox1*, M. Buckwell2, W.H. Ng1, D.J. Mannion1, A. Mehonic1, P. R. Shearing2, S. Fearn3 & A.J. Kenyon1

1: Department of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, UK, 2: Department of Chemical Engineering, University College London, Torrington Place, London WC1E 7JE, UK, 3: Department of Materials, Imperial College London, South Kensington Campus, London SW7 2AZ, UK

15:30 **Coffee break**
16:00 **Ag-based volatile resistive switching memories for brain-inspired architectures** **R.07.05**

Saverio Ricci (1), David Kappel (2), Christian Tetzlaff (2), Matteo Farronato (1), Alessandro Milozzi (1), Stefan Slesazek (3), Thomas Mikolajick (3), Erika Covi (3), Daniele Ielmini (1)

(1) Politecnico di Milano, Milano, Italy. (2) University of GÃ¶ttingen, GÃ¶ttingen, Germany. (3) NaMLab gGmbH, Dresden, Germany.

16:15 **Solving EXACT COVER problem using Network-based Biocomputation** **R.07.06**

Pradheebha Surendiran1, Christoph Robert Meinecke2, Aseem Salhotra3, Georg Heldt2, Jingyuan Zhu1, Alf MÃ¶nsson3, Stefan Diez5, Danny Reuter2, Hillel Kugler4, Heiner Linke1, Till Korten5

1 NanoLund and Solid State Physics, Lund University, Lund, Sweden, 2
Department of Nano Device Technologies, Fraunhofer ENAS, 09126 Chemnitz,
Germany, 3 Department of Chemistry and Biomedical Sciences, Linnaeus
university, Kalmar, Sweden, 4 Faculty of Engineering, Bar-Ilan University,
Ramat Gan, Israel, 5 B CUBE - Center for Molecular Bioengineering, Technische
Universität Dresden, D-01307 Dresden, Germany

Electrical and Mechanical Tonic Bursting in Defective Vanadium

16:30 **Dioxide**

R.07.07

Upanya Khandelwal, Rama Satya Sandilya, Sushobhan Avasthi, Saurabh
Chandorkar, Pavan Nukala
Indian Institute of Science, Bengaluru, Karnataka, India



Symposium S

Sessions: Room 102| MINI Building

Poster Session: Small Hall| Main Building

Functional materials:

Phase transitions and properties of ferroics in the form of single crystals, ceramics and thin films II

Symposium Organizers: **Anthony Michael GLAZER** University of Oxford UK

Guillaume NATAF Centre National de la Recherche Scientifique (CNRS) France

Krystian ROLEDER Institute of Physics | University of Silesia Poland

Marek PAŚCIAK Institute of Physics, Czech Acad. Sci. Czech Republic

Symposium S Program

MONDAY, 19 SEPTEMBER 2022

Session 9:00 - 10:30 : Chair - Mike Glazer

Corbino Cones and Memory Devices involving LiNbO₃ Ferroelectric Domain

9:00 **Walls** **S.01.01**

J. M. Gregg

Queen's University Belfast

Optical vortices operation with using of single ferroic crystals via parametrical optic effects

9:30 **S.01.02**

Kostyrko M., Vasyukiv Yu., Adamenko D., Skab I. and Vlokh R.

O.G. Vlokh Institute of Physical Optics, 23 Dragomanov Str. Lviv, Ukraine, 79005,
vlokh@ifio.lviv.ua

10:00 **Skymionics: Species, domains and paths to the electric DMI** **S.01.03**

Jiř,Ā Hlinka

Institute of Physics, Czech Acad.Sci.

10:30 **Coffee break**

Session 11:00 - 12:30 : Chair - Jiř

11:00 **Translational covariance of flexoelectricity at ferroelectric domain walls** **S.01.01**

Oswaldo DiĀċguez, Massimiliano Stengel

Oswaldo DiĀċguez [1, 2] , Massimiliano Stengel [3, 4] [1] Department of Materials Science and Engineering, Faculty of Engineering, Tel Aviv University, Tel Aviv 6997801, Israel [2] Theory and Simulation Group, Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC, BIST, Campus UAB, Bellaterra, Barcelona 08193, Spain [3] Institut de CiĀċncia de Materials de Barcelona (ICMAB-CSIC), Campus UAB, 08193 Bellaterra, Spain [4] ICREA - InstituciĀċ Catalana de Recerca i Estudis AvanĀċats, 08010 Barcelona, Spain

11:30 **Nonlinear piezoelectric response and domain-wall contributions in lead-based relaxor ferroelectric ceramics** **S.01.02**

Tadej Rojac, Mirela Dragomir, Mojca Otonicar
Jozef Stefan Institute, 1000 Ljubljana, Slovenia

12:00 **Understanding the polar nature of antiphase boundaries** **S.01.03**

Hiroko Yokota, Zheyi An, Kyomaru Kurihara, Nozomu Hasegawa, Nan Zhang, Marek Paściak, A. M. Glazer

Chiba Univ., JST PRESTO, Xi'an Jiaotong Univ., Institute of Physics of the Czech Academy of Sciences,, Oxford Univ., Warwick Univ.

12:30 **Lunch**

Session 14:00 - 15:30 : Chair - Hiroko Yokota

14:00 **Revealing the orientation relationship between ferroelastic domains using high-resolution X-ray diffraction** **S.01.07**

SemÅ«n Gorfman 1, David Spirito 1, Guanjie Zhang 2, Carsten Detlefs 3, Nan Zhang 2

1 Department of Materials Science and Engineering, Faculty of Engineering, Tel Aviv University, Tel Aviv, Israel 2 Electronic Materials Research Laboratory, Key Laboratory of the Ministry of Education and International Center for Dielectric Research, School of Electronic and Information Engineering, Xi'an, China 3 European Synchrotron Radiation Facility, Grenoble, France

14:30 **Confinement-driven inversion of the domain scaling in polycrystalline ErMnO₃** **S.01.08**

J. Schultheiss

Department of Materials Science and Engineering, NTNU Norwegian University of Science and Technology, 7034, Trondheim, Norway

15:00 **Polarization dynamics during ferroic oxide thin film growth** **S.01.09**

Morgan Trassin

Department of Materials, ETH Zurich

15:30 **Coffee break**

Session 16:00 - 17:30 : Chair - Jan Schultheiss

16:00 **Probing the chemical and electronic structure of BaTiO₃ ultrathin films** **S.01.10**

S. Gonzalez (1), P. Rojo-Romeo (2), M. Bugnet (3), P. SchÄ¶ffmann (4), E. Otero (4), B. Vilquin (2), N. Baboux (1), B. Gautier (1), G. Herrera (5), O. Boisson (5), D. Le Roy (5), F. Tournus (5), P. Ohresser (4), V. Dupuis (5), I. C. Infante (1)

1 Univ. Lyon, INSA Lyon, CNRS, ECL, UCBL, CPE Lyon, Institut des Nanotechnologies de Lyon, UMR5270, 69621 Villeurbanne, France - sara.gonzalez@insa-lyon.fr, 2 Univ. Lyon, ECL, CNRS, CPE Lyon, Institut des Nanotechnologies de Lyon, UMR5270, Ecully, France, 3 Univ. Lyon, CNRS, INSA Lyon, UCBL, MATEIS, UMR 5510, 69621 Villeurbanne, France, 4 Synchrotron SOLEIL, CNRS-CEA, LÄ™™Orme des Merisiers, Saint-Aubin, 91192 Gif-sur-Yvette, France, 5 Univ Lyon, UniversitÄ© Claude Bernard Lyon 1, Institut LumiÄ™re MatiÄ™re, CNRS UMR 5306, France

Polarons and charge-carrier separation at ferroelectric domain walls in BiFeO₃

16:30

S.01.11

Sabine KÄ¶rbel

Institute of Solid State Theory and Optics, Friedrich Schiller University of Jena, Germany

Electronic properties of ferroelastic twin walls in CaTiO₃ single crystals and epitaxially strained thin films

16:45

S.01.12

G. Magagnin, Q. Wu, D. Martinotti, E.K.H. Salje, C. Lubin, C. Paillard, G. Geneste, T. Maroutian, N.Barrett

SPEC, CEA, CNRS, UniversitÄ© Paris-Saclay, CEA Saclay, 91191 Gif-sur-Yvette, France, SPEC, CEA, CNRS, UniversitÄ© Paris-Saclay, CEA Saclay, 91191 Gif-sur-Yvette, France, SPEC, CEA, CNRS, UniversitÄ© Paris-Saclay, CEA Saclay, 91191 Gif-sur-Yvette, France, Dept. of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ, UK, SPEC, CEA, CNRS, UniversitÄ© Paris-Saclay, CEA Saclay, 91191 Gif-sur-Yvette, France, Laboratoire Structures, PropriÄ©tÄ©s et ModÄ©lisation des Solides, CentraleSupÄ©lec, CNRS-UMR8580, UniversitÄ© Paris-Saclay, 91190 Gif-sur-Yvette, France, CEA, DAM, DIF, F-91297 Arpajon, France and UniversitÄ© Paris-Saclay, CEA, LMCE, 91680 BruyÄ™res-le-ChÄ™tel, France, UniversitÄ© Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, 91120, Palaiseau, France, SPEC, CEA, CNRS, UniversitÄ© Paris-Saclay, CEA Saclay, 91191 Gif-sur-Yvette, France

Hardening precipitate plates in alkaline niobate with full pinning on domain walls

17:00

S.01.13

Shuang Gao¹, Changhao Zhao¹, Jurij Koruza², Hans-Joachim Kleebe¹, JÄ¶rgen RÄ¶del¹

1Department of Materials and Earth Sciences, Technical University of Darmstadt, 64287 Darmstadt, Germany 2Institute for Chemistry and Technology of Materials, Graz University of Technology, A-8010 Graz, Austria

17:15 **Polar Skyrmions in BaTiO₃ at low-temperature** **S.01.14**
 Mauro A.P. Gonçalves, Marek Pałciak, Jiří Hlinka

Institute of Physics of the Czech Academy of Sciences, Prague 18221, Czech Republic

S.Poster Session 17:30 - 19:30 : Guillaume Nataf & Marek Pałciak

17:30 **Structural and magnetic properties of the Tb³⁺ ion doped into aluminum and gallium borate single crystals** **S.P.1**

A.A. Prokhorov¹, R. Minikayev³, D.V. Savchenko^{1,4}, J. Lančok¹, A.D. Prokhorov²

1. Institute of Physics AS CR, Na Slovance 2, 18221 Prague, Czech Republic 2. A.A. Galkin Donetsk Physico-Technical Institute, R. Luxembourg 72, 83114 Donetsk 3. Institute of Physics PAS, al. Lotnikow 32/46, 02-668, Warsaw, Poland 4. National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", pr. Peremohy 37, Kyiv, 03056, Ukraine

17:30 **Impact of external electric field on the physical properties of ferroelectric oxides** **S.P.2**
 K. Shanmuga Priya, Subhajit Pal, P. Murugavel

Pervoskites Materials Laboratory, Functional Oxide Research Group (FORG), Department of Physics, Indian Institute of Technology Madras, Chennai, Tamil Nadu, India. School of Engineering & Materials Science, Queen Mary University of London, London, E1 4NS, United Kingdom.

17:30 **A study on Epoxide based Ceramic Slurry for Improving Peeling between layers in Ceramic Green Body prepared by Ceramic DLP 3D Printing** **S.P.3**
 Haeun Seo, Hye-Yeong Park, Haeun Kim, Donghyun Kim, Dong Gyeong Kim, Hyeryang Choi, SeungCheol Yang

Department of Materials Convergence and System Engineering, Changwon National University, Changwon, Gyeongsangnam 51140, Republic of Korea

17:30 **Different mechanisms of phase transitions in PbHfO₃ based solid solutions** **S.P.4**

Irena Jankowska-Sumara¹, Marek Pa?ciak², Jae-Hyeon Ko³, Andrzej Majchrowski⁴, Mariola K?dzio?ka-Gawe?5, Roman Burkovsky⁶

1. Institute of Physics, Cracow Pedagogical University, Krak?w, Poland 2. Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic 3. School of Nano Convergence Technology, Hallym University, Chuncheon, Korea 4. Institute of Applied Physics, Military University of Technology, Warsaw, Poland 5. Institute of Physics, University of Silesia, Chorz?w, Poland 6. Peter the Great Saint-Petersburg Polytechnic University, St.-Petersburg, Russia

17:30 **Indirect measurements of the electrocaloric effect in BaTiO₃:Eu ceramics** **S.P.5**

Magdalena Krupska-Klimczak, Irena Jankowska-Sumara, Dorota Sitko, Przemys?aw Gwizd

Institute of Physics, Pedagogical University of Cracow

17:30 **Structural Analysis on Epitaxial Metal-Ferroelectric-Metal thin film stack on GaN-technology** **S.P.6**

Md Redwanul Islam, Georg Sch?nweiger, Niklas Wolff, Simon Fichtner, Lorenz Kienle

Md Redwanul Islam, Niklas Wolff, Simon Fichtner, Lorenz Kienle Synthesis and Real Structure, Department of Materials Science, Kiel University, Kaiserstra?e 2, Kiel, Germany. Georg Sch?nweiger Institute of Electrical and Information Engineering, Kiel University, Kaiserstr. 2, 24143 Kiel, Germany. Simon Fichtner Fraunhofer Institute for Silicon Technology (ISIT), Fraunhoferstr. 1, D-25524 Itzehoe, Germany.

17:30 **Crystal growth and characterization of CaMn₂O₄** **S.P.7**

D. Z. Dimitrov^{1,2}, J.-Y. Juang³, V. Marinova², M.M. Gospodinov¹

1. Institute of Solid State Physics, Bulgarian Academy of Sciences, Sofia, Bulgaria, 2. Institute of Optical Materials and Technologies, Bulgarian Academy of Sciences, 3. Department of Electrophysics, National Yang Ming Chiao Tung University, Hsinchu, Taiwan

17:30 **Development of Epitaxial and Mesoporous BaTiO₃ Nanocomposites Scaffolds: A Comparative Study** **S.P.8**

E. Palladino [1], S. Pal [1], M. A. De h-Ora [2], J. L. MacManus-Driscoll [2], J. Briscoe [1]

[1] School of Engineering and Materials Science, Queen Mary University of London, Mile End Road, London E1 4NS, UK [2] Department of Materials Science and Metallurgy, University of Cambridge, Cambridge CB3 0FS UK

17:30 **Optical transitions in SmFeO₃** **S.P.9**

Georgy Gordeev, Mads Weber, Stephanie Reich, Mael Guennou

Department of Physics and Materials Science, University of Luxembourg, 41 Rue du Brill, L-4422, Belvaux, Luxembourg, Institut des Molécules et Matériaux du Mans, UMR 6283 CNRS, Le Mans Université, 72085, Le Mans, France, Department of Physics, Freie Universität Berlin, Berlin 14195, Germany, Department of Physics and Materials Science, University of Luxembourg, 41 Rue du Brill, L-4422, Belvaux, Luxembourg

- 17:30 **Ytterbium doping effects into the Ba and Ti sites of perovskite barium titanate: Electronic structures and optical properties** **S.P.10**

Adil Alshoaibia , Mohammed Benali Kanouna , Bakhtiar Ul Haqb , Salem AlFaifyb , Souraya Goumri-Said

Department of Physics, College of Science, King Faisal University, P.O. Box 400, Al-Ahsa 31982, Saudi Arabi

- 17:30 **Insights into the Impact of Yttrium Doping at the Ba and Ti Sites of BaTiO3 on the Electronic Structures and Optical Properties:** **S.P.11**

Adil Alshoaibi, Mohammed Benali Kanoun, Bakhtiar Ul Haq, Salem AlFaify, and Souraya Goumri-Said

Department of Physics, College of Science, King Faisal University, Al-Ahsa 31982, Saudi Arabia, Email: adshoaibi@kfu.edu.sa

- 17:30 **Lead hafnium crystals doped with lanthanum as a material for high-power applications** **S.P.12**

D. Havryliuk, I. Gruszka, M. Zubko, M.Wojtyniak and J. Piecha,

A. Chełkowski Institute of Physics, University of Silesia, ul. 75 Pułku Piechoty 1, 41-500 Chorzów, Poland, Institute of Materials Engineering, University of Silesia in Katowice, ul. 75 Pułku Piechoty 1a, Chorzów, 41-500, Poland, Institute of Physics – Center for Science and Education, Silesian University of Technology, Krasińskiego 8, 40-019 Katowice, Poland

- 17:30 **Structural diversity in PbZrO3-based materials from first principles and atomistic simulations** **S.P.13**

Marek Pałciak

TUESDAY, 20 SEPTEMBER 2022

Session 9:00 - 10:30 : Chair - Sabine Křrbel

- | | | |
|-------|--|----------------|
| 9:00 | On the search for new antiferroelectric materials
Mael Guennou
University of Luxembourg | S.02.01 |
| 9:30 | Calcium titanate: a reinvestigation
Philippe Ghosez
Theoretical Materials Physics, CESAM, University of Liege | S.02.02 |
| 10:00 | Theoretical studies and optimization of antiferroelectrics
Hugo Aramberri (1,2), Jorge Añíguez (1,2,3) | S.02.03 |

(1) Materials Research and Technology Department, Luxembourg Institute of Science and Technology, 5 avenue des Hauts-Fourneaux, L-4362 Esch/Alzette, Luxembourg (2) Inter-institutional Research Group Uni.lu LIST on Ferroic Materials, 41 rue du Brill, L-4422 Belvaux, Luxembourg (3) Department of Physics and Materials Science, University of Luxembourg, 41 Rue du Brill, L-4422 Belvaux, Luxembourg

10:30 **Coffee break**

Session 11:00 - 12:30 : Chair - Mael Guennou

- | | | |
|-------|--|----------------|
| 11:00 | Reversibility of the electric-field-induced phase transition in antiferroelectric NaNbO₃ | S.02.04 |
|-------|--|----------------|

Mao-Hua Zhang (1), Changhao Zhao (1), Lovro Fulanović (1), Hui Ding (1), Niloofar Hadaeghi (1), Sonja Egert (2), Hongbin Zhang (1), Pedro B. Groszewicz (2,3), Jurij Koruza (4)*

1. Department of Materials and Earth Sciences, Technical University of Darmstadt, Germany 2. Physical Chemistry of Condensed Matter, Technical University of Darmstadt, Germany. 3. Department of Radiation Science and Technology, Delft University of Technology, Netherlands. 4. Institute for Chemistry and Technology of Materials, Graz University of Technology, Austria. * Presenting author: jurij.koruza@tugraz.at

11:30 **Spontaneous and field-induced symmetry breaking in relaxors and centrosymmetric dielectrics** **S.02.05**

Lukas Riemer, Milica Vasiljevic, Paul Muralt, Dae-Sung Park, Dragan Damjanovic
Institute of Materials, Ecole polytechnique fédération de Lausanne, Lausanne, Switzerland

12:00 **Layer Group Analysis and Landau-Ginzburg theory of domain walls** **S.02.06**
W.Schranz, A. Tröster, I. Rychetsky

University of Vienna, Faculty of Physics, Physics of Functional Materials,
Boltzmanngasse 5, A-1090 Wien, Austria, Institute of Physics, Academy of Sciences of
the Czech Republic, Na Slovance 2, 18221 Prague 8, Czech Republic

12:30 **Lunch**

Session 14:00 - 15:30 : Chair - Jurij Koruza

14:00 **Relaxor ferroelectrics for neuromorphic functionalities** **S.02.07**
B. Dkhil* *on behalf of many co-authors

Université Paris-Saclay, CentraleSupélec, CNRS-UMR8580, Laboratoire Structures,
Propriétés et Modélisation des Solides, 91190 Gif-sur-Yvette, France

14:30 **Piezoelectricity and piezoelectric switching in nominally centrosymmetric phases** **S.02.08**
Oktay Aktas

State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University,
Xi'an 710049, China

15:00 **Electrochemical Interface Stability of Piezoelectrics** **S.02.09**
Andreas Klein

Technical University of Darmstadt, Institute of Materials Science, Electronic Structure of
Materials, Otto-Berndt-Straße 3, 64287 Darmstadt, Germany

15:30 **Coffee break**

Session 16:00 - 17:30 : Chair: Sara Gonzalez

16:00 **Epitaxial zirconia films on fluorite substrates** **S.02.01**

G. De Luca, S. Ganguly, J. Padilla, J. M. Caicedo, J. Santiso, G. Catalan

Catalan Institute of Nanoscience and Nanotechnology (ICN2)

16:15 **Bulk photovoltaic and electro-optic response in solution-processed BiFeO₃ films** **S.02.02**

Alfredo Blázquez Martínez,^{1,2,3} Patrick Grysan,¹ Stéphanie Girod,¹ Veronika Kovacova,^{1,3} Sebastjan Glinsek,^{1,3} Pranab Biswas,^{2,3} Mael Guennou,^{2,3} Torsten Granzow^{1,3}

¹Luxembourg Institute of Science and Technology, Materials Research and Technology Department, 41 rue du Brill, L-4422 Belvaux, Luxembourg ²University of Luxembourg, 41 rue du Brill, L-4422 Belvaux, Luxembourg ³Inter-institutional Research Group Uni.lu@LIST on Ferroic Materials, 41 rue du Brill, Belvaux L-4422, Luxembourg

16:30 **Origin of medium-size polarons in WO₃** **S.02.03**

Hamideh Hassani, Bart Partoens, Eric Bousquet, and Philippe Ghosez

Theoretical Materials Physics, Q-MAT, CESAM, University of Liege, Liege, Belgium, Department of Physics, University of Antwerp, Antwerp, Belgium

16:45 **Dielectric spectroscopy in broad range of the BaTiO₃ and BaZrO₃ solid solutions** **S.02.04**

Jan Petzelt, Viktor Bovtun, Dmitry Nuzhnyy, Martin Kempa, Maxim Savinov, Marek Pařízek, Stanislav Kamba, Giovanna Canu* and Vincenzo Buscaglia*

Department of Dielectrics, FZU - Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic *Institute of Condensed Matter Chemistry and Technologies for Energy, CNR-ICMATE, Genoa, Italy

17:00 **Functionality dependence on variable light and temperature conditions measured by Scanning Probe Microscopy** **S.02.05**

C. Saguy, H. Elangovan, R. Saraf, V. Maheshwari, A. Kumar, A. Sehirlioglu, and Y. Ivry, C. Saguy: Solid State Institute, Technion ? Israel Institute of Technology, Haifa 32000, Israel H. Elangovan and Y. Ivry: Department of Material Sciences and Engineering, Technion ? Israel Institute of Technology. Haifa 32000, Israel R. Saraf and V. Maheshwari: Department of Chemistry, Waterloo Institute of Nanotechnology, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada A. Sehirlioglu: Department of Materials Science and Engineering, Case Western Reserve University, Cleveland, OH 44106, United States

12:30 **Lunch**

Session 14:00 - 15:30 : Chair - Philippe Ghosez

14:00 **Can a Displacive Ferroelectric Phase Transition Induce Antiferromagnetic Order in Multiferroic BiMn₃Cr₄O₁₂?** **S.03.01**
 S. Kamba¹, A. Maia¹, M. Savinov¹, P. Ondrejko¹, C. Kadlec¹, M. Mál¹ek¹, J. Ka¹til¹, A. A. Belik²

¹Institute of Physics of the Czech Academy of Sciences, Na Slovance 2, 182 21 Prague 8, Czech Republic, ²International Center for Materials Nanoarchitectonics (WPI-MANA), National Institute for Materials Science (NIMS), Namiki 1-1, Tsukuba, Ibaraki 305- 0044, Japan

14:30 **Topological switching in multiferroic GdMn₂O₅** **S.03.02**
 L. Ponet, S. Artyukhin, Th. Kain, J. Wettstein, S.-W. Cheong, M. Mostovoy, A. Pimenov

Italian Institute of Technology, Genova, Italy, Vienna University of Technology, Austria, Rutgers University, New Jersey, USA, University of Groningen, Netherlands, Vienna University of Technology, Austria

15:00 **Complex symmetry of phases and magnetic properties of the oxide perovskite EuTiO₃** **S.03.03**
 P. Pappas¹, A. Bussmann-Holder², H. Keller³, E. Liarokapis¹, and K. Roleder⁴

¹- Department of Physics, National Technical University of Athens, Athens 15780, Greece, ²-Max-Planck-Institute for Solid State Research, Heisenbergstr.1, D-70569 Stuttgart, Germany, ³-Physik-Institut der Universität Zürich, CH-8057 Zürich, Switzerland, ⁴-Institute of Physics, University of Silesia, ul. 75 Pu¹ku Piechoty 1, 41-500 Chorz¹ów, Poland

15:30 **Coffee break**

Session 16:00 - 17:15 : Chair - Annette Bussmann-Holder

16:00 **Ferroelectric and multiferroic two-dimensional electron gases** **S.03.04**
 Manuel Bibes
 Unit¹© Mixte de Physique CNRS/Thales

16:30 **Unravelling the role of Sm and 4f electrons for the magnetic interactions in SmFeO₃** **S.03.05**

Danila AMOROSO (1), Georgy GORDEEV (2), Bertrand DUPE (1), Mael GUENNOU (2), Matthieu VERSTRAETE (1)

(1) Université de Liège, NanoMat/Q-mat/CESAM, B-4000 Liège, Belgium, (2) University of Luxembourg, Department of physics and materials science, 41 rue du Brill, 4422 Belvaux, Luxembourg

16:45 **Magnetoelastic coupling in multiferroic orthorhombic manganites: when magnetism matters** **S.03.06**

M A Carpenter¹, D Pesquera¹, D O'Flynn^{2,8}, G Balakrishnan², N Muftić^{3,4}, A A Nugroho^{3,9}, T T M Palstra³, M Mihalik Jr⁵, M Mihalik⁵, M Zentková⁵, A Almeida⁶, J Agostinho Moreira⁶, R Vilarinho⁶ and D Meier⁷

¹ Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ, United Kingdom. ² Department of Physics, University of Warwick, Coventry CV4 7AL, United Kingdom. ³ Solid State Chemistry Laboratory, Zernike Institute for Advanced Materials, Rijksuniversiteit Groningen, Nijenborgh 4, 9747AG Groningen, The Netherlands. ⁴ Department of Physics, Universitas Negeri Malang, Jl. Semarang No.5, Malang, 65145 Indonesia, Indonesia. ⁵ Institute of Experimental Physics, Slovak Academy of Sciences, Watsonova 47, Kosice, Slovakia. ⁶ IFIMUP, Departamento de Física e Astronomia, Faculdade de Ciências da Universidade do Porto, Rua do Campo Alegre 687, 4169-007 Porto, Portugal. ⁷ Department of Materials Science and Engineering, NTNU Norwegian University of Science and Technology, 7491 Trondheim, Norway.

17:00 **Common magnetostructural coupling in TbFeO₃ and TbMnO₃: crystal-field driven or oxygen shifts?** **S.03.07**

R. Vilarinho¹, R. Vilček², A. Apostolos², S. Savvin³, C. Ritter³, Z. Guguchia⁴, R. Scheuermann⁴, M. Mihalik⁵, M. Zentkova⁵ and J. Agostinho Moreira¹

¹IFIMUP, Dep. de Física e Astronomia, Fac. de Ciências da Universidade do Porto, Portugal ²Department de Física, Universidade de Coimbra, Portugal ³Institute Laue Langevin (ILL), 38000 Grenoble, France ⁴Paul Scherrer Institute (PSI), 5232 Villigen, Switzerland ⁵Institute of Experimental Physics Slovak Academy of Sciences, Watsonova 47, Košice, Slovak Republic

THURSDAY, 22 SEPTEMBER 2022

Session 9:30 - 10:30 : Chair - Manuel Bibes

9:30 **Towards spatially resolved measurements of thermal transport and electrocaloric effects at the nanoscale in ferroelectrics** **S.04.01**

Rebecca Kelly, Olivia Baxter, Bogdan Zhigulin, Amit Kumar, Marty Gregg, Raymond McQuaid

Centre for Nanostructured Media School of Mathematics and Physics Queen's University Belfast Belfast BT7 1NN U.K.

10:00 **Tuning functional properties in ferroic oxides by negative pressure** **S.04.02**

Constance Toulouse 1, Mael Guennou 1, Jens Kreisel 1, Jean-Nicolas Audinot 2, Alfredo Blázquez Martínez 2, Torsten Granzow 2, Sebastjan Glinskić 2, Veronika Kovacova 2, Emmanuel Defay 2, Saeedeh Farokhipoor 3, Beatriz Noheda 3, Johanna Fischer 4, Vincent Garcia 4, Stéphane Fusil 4, Lluís Yedra Cardona 5

1 - Department of Physics and Materials Science, University of Luxembourg, Luxembourg, 2 - Luxembourg Institute of Science and Technology, Luxembourg, 3 - Zernike Institute for Advanced Materials, University of Groningen, The Netherlands, 4 - Unité Mixte de Recherche CNRS-Thales, France, 5 - Department of Electronics and Biomedical Engineering, University of Barcelona, Spain

10:30 **Coffee break**

Session 11:00 - 12:30 : Chair - Raymond McQuaid

11:00 **Barocaloric materials for zero-carbon heating and cooling** **S.04.03**

Xavier Moya
Department of Materials Science, University of Cambridge

11:30 **Unusual temperature- and pressure-induced phase transitions in hybrid halide perovskites with methylhydrazinium cation** **S.04.04**

Maciej Czka, M. (1), Głogor, A. (1), Ptak, M. (1), Sobczak, S. (2), Katrusiak, A. (2), Fedoruk, K. (3), Sieradzki, A. (3), Zaręba, J. K. (4)

(1)Institute of Low Temperature and Structure Research, Polish Academy of Sciences, 50-422 Wrocław, Poland (2)Faculty of Chemistry, Adam Mickiewicz University, 61-614 Poznań, Poland (3)Department of Experimental Physics, Wrocław University of Science and Technology, Wybrzeże Wyspiańskiego 27, 50-370, Wrocław (4)Institute of Advanced Materials, Wrocław University of Science and Technology, Wybrzeże Wyspiańskiego 27, 50-370, Wrocław

12:00 **Organic-inorganic hybrid, a different path of ferroelectrics for outstanding electromechanical properties** **S.04.05**

Yuzhong Hu, Marin Alexe, Minming Yang, Hong Jin Fan, Lu You, Junling Wang, Pooi See Lee
University of Warwick

12:15 **Topologically non-trivial spin-textures and multiferroicity in 2D nickel dihalides** **S.04.06**
DANILA AMOROSO

Université de Liège, Nanomat lab, Q-Mat center, CESAM Research Unit, Allée du 6 août, 19, 4000 Liege, Belgium

12:30 **Lunch**

Session 14:00 - 15:30 : Chair - Mirosław

14:00 **Research Trends on Ferroelectric Domain Wall Conductivity (DWC) Non-volatile Memory Devices and Characteristics of DWC Devices** **S.04.07**

Yoon Hyung Keum, Hyun Wook Shin, Jong Hwa Son, Jong-Soo Rhyee, Jong Yeog Son

Yoon Hyung Keum¹, Hyun Wook Shin¹, Jong Hwa Son², Jong-Soo Rhyee^{1,2}, Jong Yeog Son^{1,2} 1. Kyunghee University, Yongin-Si, Gyeonggi-Do, Korea (the Republic of). 2. V-memory Corp., Yongin-Si, Gyeonggi-Do, Korea (the Republic of).

14:15 **Enhancement of efficiency of acousto-optic Bragg diffraction due to ellipticity of optical eigenwaves. A case of ferroelectric** **S.04.08**

Oksana Mys, Myroslav Kostyrko, Dmytro Adamenko, Iryna Martynyuk-Lototska, Ihor Skab, Rostyslav Vlokh

O. G. Vlokh Institute of Physical Optics, 23 Dragomanov Street, 79005 Lviv, Ukraine

14:30 **New features of the phase diagram for Zr-rich PZT single crystals** **S.04.09**

I. Lazar (1), A. Majchrowski (2), R. W. Whatmore (3), A. M. Glazer (4,5), R. Sitko (1), D. Kajewski (1), J. Koperski (1), A. Soszyński (1), K. Roleder (1)
 (1) Institute of Physics, University of Silesia, Chorzów, Poland, (2) Institute of Applied Physics, Military University of Technology, Warszawa, Poland, (3) Department of Materials, Faculty of Engineering, Imperial College London, London, SW7 2AZ, United Kingdom, (4) Clarendon Laboratory, University of Oxford, Oxford, OX1 3PU, United Kingdom, (5) Department of Physics, University of Warwick, Coventry, CV4 7AL, United Kingdom,

The role of structural distortions in triggering the metal to insulator

14:45 **transition in NdNiO₃**

S.04.10

Mariana M. Gomes¹, Abdrazzak A. Bassou², Manjunath Balagopalan¹, Rui Vilarinho¹, Bruna Silva³, João Oliveira³, Bernardo Almeida³, Pedro Tavares², Abílio Almeida¹ and J. Agostinho Moreira¹

¹ IFIMUP, Departamento de Física e Astronomia da Faculdade de Ciências, Universidade do Porto, Rua do Campo Alegre s/n, 4169-007 Porto, Portugal ² Centro de Química-Vila Real, ECVA, Chemistry Department, Universidade de Trás-os-Montes e Alto Douro, 5000-801 Vila Real, Portugal ³ CF-UM-UP, Departamento de Física, Universidade do Minho, Campus de Gualtar, 4710-057 Braga, Portugal

15:00 **First-order isosymmetric phase transitions**

S.04.11

Simon Mellaerts, Jin Won Seo, Valeri Afanasiev, Michel Houssa, Jean-Pierre Locquet

Department of Physics and Astronomy, KU Leuven, Celestijnenlaan 200D, 3001 Leuven, Belgium, Department of Material Engineering, KU Leuven, Kasteelpark Arenberg 44, 3001 Leuven, Belgium, Imec, Kapeldreef 75, 3001, Leuven, Belgium.

15:15 **Epitaxial-like PbZrO₃ Thin Films from Chemical Solution Deposition**

S.04.12

Andreas Ost, Alfredo Blazquez-Martinez, Emmanuel Defay, Sebastjan Glinsek

Materials Research and Technology Department, Luxembourg Institute of Science and Technology, 41 Rue du Brill, Belvaux L-4422, Luxembourg

15:30 **Coffee break**

Session 16:00 - 17:00 : Constance Toulouse

Birefringence change induced by antipolar-to-polar phase transition in transparent PbZr_{0.95}Ti_{0.05}O₃ film

16:00

S.04.13

Pranab Parimal Biswas,^{1,3} Cosme Milesi-Brault^{1,2,3}, Alfredo Blázquez Martínez,^{2,3}
 Naveen Aruchamy,² Longfei Song,² Veronika Kovacova,² Sebastjan Glinsek,^{2,3} Torsten
 Granzow,^{2,3} Emmanuel Defay,^{2,3} Mael Guennou,^{1,3}
¹Department of Physics and Materials Science, University of Luxembourg, L-4422
 Belvaux, Luxembourg ²Materials Research and Technology Department, Luxembourg
 Institute of Science and Technology, L-4422 Belvaux, Luxembourg ³Inter-institutional
 Research Group Uni.lu?LIST on Ferroic Materials, L-4422 Belvaux, Luxembourg

16:15 **Photo-induced characteristics in nanostructured ferroelectric thin films** **S.04.14**

Subhajit Pal*, Emanuele Palladino, Haozhen Yuan, and Joe Briscoe
 School of Engineering & Materials Science, Queen Mary University of London, London
 E1 4NS, United Kingdom

16:30 **Enhancement of Optical Activity and Properties of Barium Titanium Oxides to Be Active in Sunlight through Using Hollandite Phase** **S.04.15**

Adil Alshoaibi, Osama Saber, Faheem Ahmed
 Department of Physics, College of Science, King Faisal University, P.O. Box 400, Al-Ahsa
 31982, Saudi Arabia

16:45 **Annealing behaviour of the morphotropic phase boundary in the high-pressure stabilized BiMg_{0.5}Ti_{0.5}O₃-BiZn_{0.5}Ti_{0.5}O₃ system** **S.04.16**

Andrei N. Salak¹, João Pedro Cardoso¹, Vladimir V. Shvartsman²

¹ Department of Materials and Ceramics Engineering and CICECO – Aveiro Institute of
 Materials, University of Aveiro, 3810-193, Aveiro, Portugal, ² Institute for Materials
 Science and CENIDE – Centre for Nanointegration Duisburg-Essen, University of
 Duisburg-Essen, 45141, Essen, Germany.



Symposium F

Sessions: Room 144 | Main Building

Joint Sessions F&G: Room 306 | Main Building

Poster Session: Small Hall | Main Building

Wide-band-gap semiconductors:

Ultra wide-band-gap semiconductors for energy and electronics (UWBG2E)

Symposium Organizers: **Ekaterine CHIKOIDZE** Univeristé Paris Saclay, CNRS France

Henryk TEISSEYRE Institute of Physics, Polish Academy of Sciences Poland

Motoaki IWAYA Meijo University Japan

Symposium F Program

MONDAY, 19 SEPTEMBER 2022

ULTRA -1 : Michał Bockowski

9:00 **Polarization-doping of AlGa_N laser diodes in numerical simulations** **F.I.1**

Konrad Sakowski (1,2), Kosuke Sato (3,4), Kazuki Yamada (4), Pawel Kempisty (2), Motoaki Iwaya (4), Pawel Strak (2), Yoshihiro Kangawa (5), Grzegorz Muziol (2), Jacek Piechota (2), Stanislaw Krukowski (2)

1 Institute of Applied Mathematics and Mechanics, University of Warsaw, Banacha 2, 02-097 Warsaw, Poland 2 Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland 3 Advanced Devices Technology Center, Asahi-Kasei Corporation, Fuji, Shizuoka 416-8501, Japan 4 Faculty of Science and Technology, Meijo University, Nagoya, Aichi 468-8502, Japan 5 Research Institute for Applied Mechanics, Kyushu University, Kasuga, Fukuoka 816-8580, Japan

9:30 **Hot-wall MOCVD growth of low Al content, high electron mobility n-type Al_xGa_{1-x}N layers** **F.I.2**

Rosalia Delgado Carrascon(1,2), Steffen Richter(1,2,3,4), Plamen P. Paskov(1,2), Son Phuong Le(1), Vallery Stanishev(1,2,3), Nerijus Armakavicius(1,2,3), Vanya Darakchieva*(1,2,3,4) *presenting author

(1)Department of Physics, Chemistry and Biology, Linköping University, 581 83 Linköping, Sweden, (2)Center for III-Nitride Technology, C3NiT-JanÅ©n, Linköping University, 581 83 Linköping, Sweden, (3)THz Materials Analysis Center (TheMAC), Linköping University, 581 83 Linköping, Sweden, (4)Solid State Physics Department, Lund University, Box 118, 22100 Lund, Sweden

9:45 **High-temperature annealed Al(Ga)_N templates for optimized epitaxial growth of UV-C LEDs** **F.I.3**

Kevin GUY1, Mathieu BERNARD1, Aly ZAITER2, Adrien MICHON2, Julien BRAULT2, Jean-Yves DUBOZ2, Guy FEUILLET1, Florian DUPONT1

1Univ. Grenoble Alpes, CEA, LETI, F-38000 Grenoble, France. , 2CRHEA-CNRS UPR10, Centre de Recherche sur l'Épitaxie et ses Applications, Centre National de la Recherche Scientifique, 06560 Valbonne, France.

10:00 **Boron nitride nanosheets: thermal properties and applications** **F.I.4**

Qiran Cai, Hongbo Jiang, Luhua Li, Ying Chen

Institute for Frontier Materials, Deakin University, Waurn Ponds, VIC, 3216, Australia

10:30 **coffee break**

ULTRA -2 : UMEZAWA Hitoshi

11:00 **Van der Waals epitaxial growth of wide bandgap III-nitrides on 2D layered hexagonal boron nitride.** **F.II.1**

Suresh Sundaram^{1,2,3*}, Phuong Vuong², Adama Mballo², Vishnu Ottapilakal², Soufiane Karrakchou^{1,2}, Gilles Patriarche⁴, Paul L. Voss^{1,2}, Jean Paul Salvestrini^{1,2,3}, Abdallah Ougazzaden^{1,2}.

¹Georgia Institute of Technology, School of Electrical and Computer Engineering, GT-Lorraine, 57070 Metz, France. ²CNRS, UMI 2958, G T - CNRS, 2 rue Marconi, 57070 Metz, France. ³GT Lorraine, 2 rue Marconi, 57070 Metz, France. ⁴Centre de Nanosciences et de Nanotechnologies, Université Paris-Saclay, C2N Site de Marcoussis, Route de Nozay, F-91460 Marcoussis, France.

11:30 **Surface photovoltage spectroscopy of ultra wide-band-gap semiconductors** **F.II.2**

Thomas Dittrich

Helmholtz-Zentrum Berlin für Materialien und Energie GmbH

11:45 **Locally Ion Implantation and Annealing Effects in Diamond** **F.II.3**

M.BOURAS, K. ISOIRD, M-A. PINAULT-THAURY, G. GROSSET, F. CRISTIANO, R. GILLET, F. JOMARD, J. TASSELLI, R. GOURAD, Y. SPIEGEL, M. BOURAS*, Y. SPIEGEL *presenting person

K. ISOIRD, F. CRISTIANO, J. TASSELLI, R. GOURAD LAAS-CNRS, Université de Toulouse, CNRS, UPS, Toulouse, France M. BOURAS, M-A. PINAULT-THAURY, R. GILET, F. JOMARD Université Paris-Saclay, UVSQ, CNRS, GEMaC, 78000, Versailles, France G. GROSSETY, SPIEGEL, Ion Beam Service, ZI Peynier Rousset, rue Gaston Imbert, F-13790, France Mohamed Bouras, Université Paris-Saclay, UVSQ, CNRS, GEMaC, 78000, Versailles, France Yohann Spiegel, Ion Beam Service, ZI Peynier Rousset, rue Gaston Imbert, F-13790, France

UV-C LEDs fabricated on face-to-face annealed sputter-deposited AlN

12:00 **templates**

F.II.4

Kenjiro Uesugi, Takao Nakamura, Kanako Shojiki, Shiyu Xiao, Masataka Kubo, Hideto Miyake

MIE Co-creation Organization, Mie University, Graduate School of Regional Innovation Studies, Mie University, Graduate School of Engineering, Mie University, Institute of Industrial Science, The University of Tokyo

12:30 **Lunch break**

ULTRA -3 : Henryk Teisseyre

14:00 **A novel ultra-wide bandgap alloy system based on rutile-type oxides**

F.III.1

Hitoshi Takane, Yuichi Ota, Takeru Wakamatsu, Tsutomu Araki, Katsuhisa Tanaka, and Kentaro Kaneko

Kyoto University: Hitoshi Takane, Takeru Wakamatsu, Katsuhisa Tanaka, Kentaro Kaneko, Tokyo Metropolitan Industrial Technology Research Institute: Yuichi Ota, Ritsumeikan University: Tsutomu Araki

Highly-porous 3D networks of ultra-wide-band-gap semiconductor

14:15 **ZnGa₂O₄ and its optical and electrochemical properties**

F.III.2

Niklas Wolff^{1,6*}, Tudor Braniste², Helge Kr  lger³, Huayna Terraschke^{4,6}, Md. Redwanul Islam¹, Lena M. Saure³, Fabian Sch  tt^{3,6}, Sandra Hansen^{3,6}, Rainer Adelung^{3,6}, Ion Tiginyanu^{2,5*}, Lorenz Kienle^{1,6*}

Dr. Niklas Wolff, Md. Redwanul Islam, Prof. Dr. Lorenz Kienle 1 Synthesis and Real Structure, Department of Materials Science, Kiel University, Kaiserstra  e 2, Kiel 24143, Germany 6 Kiel Nano, Surface and Interface Science (KiNSIS), Kiel University, Christian-Albrechts-Platz 4, D-24118 Kiel, Germany Dr. Tudor Braniste (0000-0001-6043-4642) 2 National Center for Materials Study and Testing, Technical University of Moldova, Stefan cel Mare 168, Chisinau 2004, Moldova Lena M. Saure, Helge Kr  lger, Dr. Fabian Sch  ltt, Dr. Sandra Hansen, Prof. Dr. Rainer Adelung 3 Functional Nanomaterials, Department of Materials Science, Kiel University, Kaiserstra  e 2, Kiel 24143, Germany 4 Jun.-Prof. Dr. Huayna Terraschke (0000-0002-5479-7663) Institute for Inorganic Chemistry, Kiel University, Max-Eyth-Stra  e 2, Kiel 24118, Germany Prof. Dr. Ion Tiginyanu (0000-0003-0893-0854) 2 National Center for Materials Study and Testing, Technical University of Moldova, Stefan cel Mare 168, Chisinau 2004, Moldova 5 Academy of Sciences of Moldova, Stefan cel Mare av. 1, Chisinau 2001, Moldova

14:30 **Ultra-wide Bandgap Spinel ZnGa₂O₄ Self-doping Capability**

F.III.3

Z. Chi (1), F.G. Tarntair (2), M. Fr  gniaux (3), W.Y. Wu (4), C. Sartel (1), I. Madaci (1), V. Sallet (1), Y. Dumont (1), A. P  rez-Tom  s (5), R.H. Horng (2), E. Chikoidze(1)
(1) Groupe d  tude de la Mati  re Condens  e (GEMaC), Universit   Paris-Saclay, Universit   de Versailles Saint Quentin en Yvelines    CNRS, 45 Av. des Etats-Unis, 78035 Versailles Cedex, France (2) Institute of Electronics, National Yang Ming Chiao Tung University, Hsinchu 30010, Taiwan, ROC (3) Institut Lavoisier de Versailles (ILV), Universit   Paris-Saclay, Universit   de Versailles Saint Quentin en Yvelines    CNRS, 45 Av. des Etats-Unis, 78035 Versailles Cedex, France (4) Department of Materials Science and Engineering, Da-Yeh University, Changhua 51591, Taiwan (5) Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and The Barcelona Institute of Science and Technology, Barcelona, Spain

14:45 **Current status of diamond power devices for high voltage applications** **F.III.4**

Mariko Suzuki, Daniel Araujo
University of C  diz

15:15 **coffee break**

ULTRA -4 : Georges Bremond

16:00 **Photoelectric readout of the NV electron and nuclear spins in diamond** **F.IV.1**

Michal Gulka

(1) Institute for Materials Research (IMO), Hasselt University, Diepenbeek, Belgium, (2) Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences, Prague, Czechia

16:30 **Diamond Semiconductor Devices for harsh environmental applications** **F.IV.2**
Hitoshi Umezawa
AIST

17:30 **Growth, fabrication and applications of far-UVC LEDs with emission below 240 nm** **F.IV.3**
T. Wernicke

Technische Universität Berlin, Institute of Solid State Physics, Berlin, Germany

TUESDAY, 20 SEPTEMBER 2022

Gallium Oxide -1 : David Rogers

9:00 **A review of recent progress, prospects and challenges of Ga₂O₃ and related ultra-wide bandgap semiconductor oxides** **F.V.1**
Amador Perez-Tomas

Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and BIST, Campus UAB, Bellaterra, 08193 Barcelona, Spain

9:30 **Fabrication and Characterization of the Metal Oxide Thin Films by Mist CVD** **F.V.2**
Toshiyuki KAWAHARAMURA, Li Liu, Giang T. Dang

School of Systems Engineering, Kochi University of Technology, Center for Nanotechnology, Research Institute, Kochi University of Technology

10:00 **Depth-dependent dislocation density and electrical properties of $\text{In}_{\pm}\text{-Ga}_{2}\text{O}_3$ film on sapphire substrate** **F.V.3**

Hitoshi Takane, Takeru Wakamatsu, Kentaro Kaneko, and Katsuhisa Tanaka
Kyoto University

10:15 **Can the Formation of Compensating Donors be Suppressed in Modulated p-Doped Gallium Oxide Quantum Wells?** **F.V.4**
Tamar Tchelidze, Zaal Machavariani, Giorgi Lemonjava, Sergi Kapanadze, Ana Kurtanidze

Ivane Javakhishvili Tbilisi State University, Faculty of Exact and Natural Sciences
 10:30 **coffee break**

Gallium Oxide -2 : Tamar Tchelidze

11:00 **AlGa2O3 Grown by Pulsed Laser Deposition and the Application to Solar Blind Photodetectors** **F.VI.1**
 D. J. Rogers, F. H. Teherani, V. E. Sandana, P. Bove

Nanovation, 8 route de Chevreuse, 78117 Chateaufort, France.

11:15 **Identification by DLTS of acceptors levels in Zn doped beta-Ga2O3 epilayers grown by MOCVD.** **F.VI.2**
 G. Bremond (1*), C. Sartet (2), Z. Chi (2), E. Chikoidze (2), G. Guillot (1), J.M. Bluet (1)

(1) Univ. Lyon, INSA Lyon, CNRS, ECL, UCBL, CPE, Institut des Nanotechnologies de Lyon (INL-UMR5270), 69621 Villeurbanne Cedex, France
 (2) Groupe d'Etude de la Matière Condensée (GEMaC), Université Paris-Saclay, UVSQ - CNRS, 45 Av. des Etats-Unis, 78035 Versailles Cedex, France *E-mail: georges.bremond@insa-lyon.fr

11:30 **Out of equilibrium doping of β -Ga2O3 by irradiation with 2.5 MeV electron beam.** **F.VI.3**

Marcin Konczykowski, Romain Grasset, Lucia Romero Vega, Thi-Huong Dang, Antonino Alessi, Henri-Jean Drouhin, Henri Jaffrès, Agnieszka Wołowicz

Laboratoire des Solides Irradiés, Ecole Polytechnique, CEA/DRF/IRAMIS, CNRS, Institut Polytechnique de Paris, 91128 Palaiseau, France, Unité Mixte de Physique, CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, 91767 Palaiseau, France, Faculty of Physics, University of Warsaw, Ludwika Pasteura 5, 02-093 Warszawa, Poland

11:45 **Radiation effects in gallium oxide** **F.VI.4**

K. Lorenz [1,2,3], M. Peres [1,2,3], D.M. Esteves [1,2,3], D. R. Pereira [1,2,3], L. C. Alves [2,4], E. Alves [2,3], S. Cardoso [1,2], X. Biquard [5]

[1] INESC MN, Lisbon, Portugal, [2] Instituto Superior Técnico (IST), University of Lisbon, Portugal, [3] IPFN, IST, University of Lisbon, Portugal, [4] C2TN, IST, University of Lisbon, Portugal, [5] Université Grenoble Alpes, CEA, IRIG, MEM, NRS, Grenoble, France

- 12:15 **Dielectric properties of In_2O_3 characterized by terahertz time domain spectroscopy** **F.VI.5**
 Takeru Wakamatsu*, Hitoshi Takane*, Kentaro Kaneko*, Itsuhiro Kakeya*, Takashi Shinohe**, Katsuhisa Tanaka*
 *Kyoto University, **FLOSFIA Inc.
- 12:30 **Lunch break**

Gallium Oxide -3 : Mariko Suzuki

- 14:00 **Ga₂O₃ vs heat: anisotropy, thermal stability, and heat removal** **F.VII.1**
 Filip Gučmann, Kristína Huľáková, Edmund Dobročka, Peter Nádaľdy, Alica Rosová, Fridrich Egyenes, Fedor Hrubíček, Javad Keshtkar, Adela Kubranská, Milan Ľapajna
 Institute of Electrical Engineering, Slovak Academy of Sciences, Džuravská cesta 9, 841 04 Bratislava, Slovakia
- 14:45 **High-performance UV-C photodetectors based on orthorhombic In_2O_3 Ga₂O₃ epilayers: electronic properties and photo-gain mechanisms** **F.VII.2**
 A. Parisini, A. Bosio, C. Borelli, M. Pavesi, A. Baraldi, P. Mazzolini, M. Bosi, L. Seravalli, S. Vantaggio, R. Fornari
- A. Parisini (1), A. Bosio (1), C. Borelli (1), M. Pavesi (1), A. Baraldi (1), P. Mazzolini (1,2), M. Bosi (2), L. Seravalli (2), S. Vantaggio (1) and R. Fornari (1,2) (1) Department of Mathematical, Physical and Computer Sciences, University of Parma, Parco Area delle Scienze 7/A, 43124 Parma, Italy (2) IMEM-CNR, Institute of Materials for Electronics and Magnetism, Parco Area delle Scienze 37/A, 43124, Parma, Italy
- 15:00 **Electronic structure of Ga₂O₃ for Cu(In,Ga)Se₂-based thin-film solar cells studied by photoelectron spectroscopy and DFT** **F.VII.3**

E. Pyatenko^{1,2}, D. Hauschild^{2,3,4}, J. Vinson⁵, R. Steininger², D. Hariskos⁶, W. Witte⁶, M. Powalla⁶, C. Heske^{2,3,4}, and L. Weinhardt^{2,3,4}
 1 Laboratory for Applications of Synchrotron Radiation (LAS), Karlsruhe Institute of Technology (KIT), Kaiserstraße 12, 76131 Karlsruhe, Germany 2 Institute for Photon Science and Synchrotron Radiation (IPS), Karlsruhe Institute of Technology (KIT), Hermann-v.-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany 3 Institute for Chemical Technology and Polymer Chemistry (ITCP), Karlsruhe Institute of Technology (KIT), Engesserstraße 18/20, 76128 Karlsruhe, Germany 4 Department of Chemistry and Biochemistry, University of Nevada, Las Vegas (UNLV), 4505 Maryland Parkway, Las Vegas, NV 89154-4003, United States 5 Material Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, Maryland 20899, United States 6 Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Meitnerstraße 1, 70563 Stuttgart, Germany

15:30 **coffee break**

Advanced Characterizations : Amador Perez

16:00 **Hot-wall MOCVD of beta-Ga₂O₃ and defect characterization by advanced THz-EPR-Ellipsometry** **F.VIII.4**

Vanya Darakchieva, Daniela Gogova, Steffen Richter, Dat Q. Tran, Valdas Jokubavicius, Rositsa Yakimova, Rosalia D. Carrascon, Plamen P. Paskov, Sean Knight, Philipp Kälhne and Mathias Schubert

Solid State Physics and NanoLund, Lund University, Sweden, Center for III-Nitride Technology C3NiT - Janz Å©n, Linköping University, Sweden, Department of Physics, Chemistry and Biology, Linköping University, Sweden
 16:30 **High spatial resolution thermal analysis by thermorefectance of power components** **F.VIII.5**
 Thierry Kociniowski Zoubir Khatir
 Gustave Eiffel University, Paris-Saclay Univ., ENS Paris-Saclay, CNRS, SATIE, 78000 Versailles, France

Poster Session : -

17:30 **The influence of the growth temperature on the properties of {ZnO/CdO}₃₀ superlattices** **F.P.1**
 A. Lysak, E. Przełsdziecka, A. Wierzbicka, P. DŁuŁŁewski, K. Morawiec, A. Adhikari, M. Stachowicz, A. Kozanecki
 Institute of Physics, Polish Academy of Sciences, Aleja Lotnikow 32/46, Warsaw, Poland

17:30 **Hole Conductivity in Ultra-wide Bandgap $\text{In}_x\text{Ga}_{1-x}\text{As}$ by Zn Doping** **F.P.2**

Z. Chi (1), C. Sartel (1), G. Bouchez (1), F. Jomard (1), V. Sallet (1), G. Guillot (2), K. Boukheddaden (1), A. Părez-Tomás (3), T. Tchelidze (4), Y. Dumont (1), E. Chikoidze (1)

(1) Groupe d'Etude de la Matière Condensée (GEMaC), Université Paris-Saclay, UVSQ $\in$ CNRS, 45 Av. des Etats-Unis, 78035 Versailles Cedex, France (2) Univ. Lyon, CNRS, ECL, UCBL, INSA Lyon, CPE, Institut des Nanotechnologies de Lyon (INL-UMR5270), 69621 Villeurbanne Cedex, France (3) Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and The Barcelona Institute of Science and Technology, Barcelona, Spain (4) Faculty of Exact and Natural Science, Department of Physics, Ivane Javakhishvili Tbilisi State University, 3 Av. Tchavtchavadze, 0179 Tbilisi, Georgia

17:30 **Crystal structure of $\text{In}_{1-x}\text{Ga}_x\text{As}$ epitaxial films grown by liquid-injection MOCVD on sapphire substrates** **F.P.3**

E. DobroŤka, A. RosovŤ, K. HuŤekovŤ, A. KubranskŤ, F. Egyenes, F. Gucmann, and M. Ľapajna

Institute of Electrical Engineering SAS, DŤbravskŤ cesta 9, 84104 Bratislava, Slovakia

17:30 **Thermodynamic analysis of Nitrogen and Magnesium Doping of Gallium oxide - Comparative Study** **F.P.4**

Ana Kurtanidze , Tamar Tchelidze

Ivane Javakhishvili Tbilisi State University, Faculty of Exact and Natural Sciences

17:30 **Effect of Al composition on the performance and optical characteristic of $\text{GaN}/\text{Al}_x\text{Ga}_{1-x}\text{N}$ heterostructures** **F.P.5**

Said Ridene

Advanced Materials and Quantum Phenomena Laboratory, Physics Department, Faculty of Sciences of Tunis, University of Tunis El Manar, 2092 Tunis, Tunisia.

17:30 **Strong correlation of the piezoelectric response and microstructure in $\text{Al}_x\text{In}_{1-x}\text{N}$ solid solutions** **F.P.6**

D. Solonenko¹, J. Strube¹, J. Fammels¹, V. RŤbisch², K. Howell², X. Zhao², J. Pilz¹, V. Pashchenko¹, S. Risquez¹, M. Moridi¹, G. Bruckner¹

1. Silicon Austria Labs GmbH, A-9524 Villach, Austria 2. Evatec AG, CH-9477 Trärlbbach, Switzerland

17:30 **Photochemical Gel Conversion of Polytitanoxane Precursor Layers to Dense and Void Free Titanium oxide Thin Films** **F.P.7**

Ayumu Nagaoka, Kyota Uda, Lina Sun, Yoshiyuki Suzuri, Tsukasa Yoshida
Yamagata University

17:30 **Fundamental studies of ZnO nanowires with ZnCdO/ZnO Multiple Quantum Wells grown for tunable light emitters** **F.P.8**

M.A. Pietrzyk¹, E. Zielony², A. Wierzbicka¹, A. Lysak¹, R. Szymon², A. Kozanecki¹

¹ Institute of Physics, Polish Academy of Sciences, Aleja Lotnikow 32/46 PL-02668, Warsaw, Poland ² Department of Quantum Technologies, Wrocław University of Science and Technology, Wybrzeze Wyspianskiego 27, 50-370 Wrocław, Poland

17:30 **Modeling of dislocations using Molecular Dynamics for Monte Carlo simulations of ion channeling** **F.P.9**

Przemysław JÄłŁswik, Cyprian MieszczylŁski, Renata Ratajczak, Kamila StefaŁska- Skrobas, Kazimierz Skrobas, Andrzej Turos, MikoŁaj Grabowski, Ewa Grzanka, Eduardo Alves, Katharina Lorenz

> National Centre for Nuclear Research, Soltana 7, 05-400 Otwock, Poland: Przemysław JÄłŁswik, Cyprian MieszczylŁski, Renata Ratajczak, Kamila StefaŁska- Skrobas, Kazimierz Skrobas, Andrzej Turos, > Institute of High-Pressure Physics PAS, Sokolowska 29/37, 01-142 Warsaw Poland: Kazimierz Skrobas, MikoŁaj Grabowski, Ewa Grzanka, > Lukasiewicz Institute of Microelectronics and Photonics, Wolczynska 133, 01-926 Warsaw, Poland: Andrzej Turos, > IPFN, Instituto Superior TÄ©cnico-Campus TecnolÄlgico e Nuclear, Universidade de Lisboa, Estrada Nacional 10, 2695-066 Bobadela, Portugal: Eduardo Alves, Katharina Lorenz, > Instituto de Engenharia de Sistemas e Computadores - Microsistemas e Nanotecnologias, Rua Alves Redol 9, 1000-029 Lisbon, Portugal: Katharina Lorenz,

- 17:30 **Γ -phase gallium oxide thin films stabilized on a-, r- and m-plane sapphire substrates via reactive magnetron sputtering and puls** **F.P.10**
 Edgars Butanovs, Martins Zubkins, Juris Purans
 Institute of Solid State Physics, University of Latvia, Kengaraga street 8, Riga, Latvia, LV-1063
- 17:30 **Optimization of the luminescence from rare-earth ions in ZnO:RE systems** **F.P.11**
 Renata Ratajczak 1, ElŁbieta Guziewicz 2, SŁawomir Prucnal 3, Cyprian Mieszczynski 1, PrzemysŁaw Jozwik 1, Mahwish Sarwar 2, Wojciech Wozniak 2, Rene Heller 3, Ulrich Kentsch 3, Stefan Facsko 3
 1 National Centre for Nuclear Research, Soltana 7, 05â€400 Otwock, Poland ,
 2 Institute of Physics, Polish Academy of Sciences, Al. Lotnikow 32/46, 02â€668 Warsaw, Poland , 3 Helmholtz-Zentrum Dresden-Rossendorf, Bautzner Landstrasse 400, D-01328 Dresden, Germany.
- 17:30 **The effect of rutile and anatase TiO₂ on Mn defect formation in Zn₂TiO₄ synthesized by solid state reaction** **F.P.12**
 L. Borkovska¹, K. Kozoriz¹, I. Vorona¹, V. Nosenko¹, T. Kryshtab²
 1Lashkaryov Institute of semiconductor physics of NASU, Pr. Nauky 41, 03028 Kyiv, Ukraine, 2Instituto PolitĂcnico Nacional â€ ESFM, Av. IPN, Ed.9 U.P.A.L.M., 07738 Mexico D.F., Mexico
- 17:30 **Highly doped Nitrogen and Zinc p-type Γ -Ga₂O₃ ultra-wide band gap for Optically controlled gates and Optoelectronics Devices** **F.P.20**
 Soroush Abbasi Zargaleh^{1,2*}, C. Sartel¹, F. Jomard¹, M. Peres³, K. Lorenz³, B. Berini¹, G. Bouchez¹, V. Sallet¹, K. Boukheddaden¹, Y. Dumont¹ E. Chikoidze¹

1Groupe d'Étude de la Matière Condensée (GEMaC), Université Paris-Saclay, UVSQ et CNRS, Versailles, France 2 Sorbonne Université, UPMC Université Paris 06, CNRS-UMR 7588, Institut des NanoSciences de Paris, Paris, France 3 Microsistemas e Nanotecnologias (INESC MN), Lisbon, Portugal and IPFN, Instituto Superior Técnico, University of Lisbon, Portugal *E-mail: *alain-sorouch.abbasi-zargaleh@uvsq.fr

17:30 **Effect of O₃ and [H₂O]/{[Zn] [Mg]} Supply Ratio on the Properties of Zn_{1-x}Mg_xO Thin Films Grown by mist-CVD** **F.P.14**

Xiaojiao Liu, Giang T. Dang, Li Liu, Toshiyuki Kawaharamura

Engineering Course, Graduate School of Engineering, Kochi University of Technology School of Systems Engineering, Kochi University of Technology Center for Nanotechnology, Research Institute, Kochi University of Technology

17:30 **Excitons and biexcitons in Gallium Oxide Nanowires and Nanotubes** **F.P.15**

Nino Zurashvili, Tamar Tchelidze, Zaal Machavariani

Ivane Javakhishvili Tbilisi State University, Faculty of Exact and Natural Sciences

17:30 **Variation in Bandgap of Amorphous Zinc Tin Oxide: Investigating the thickness dependence via in-situ STS** **F.P.16**

Peter J. Callaghan, David Caffrey, Kuanysh Zhussupbekov, Samuel Berman, Ainur Zhussupbekova, Christopher M Smith, Igor V. Shvets

School of Physics and Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN), Trinity College Dublin, Dublin 2, Ireland

17:30 **Hexagonal boron nitride foam synthesis for application in radomes** **F.P.17**

Pierre Romain, Ruth Jones, John Ballentine, Dillon McGurty, Eoin O'Sullivan, Daniel Woodward, Philip Holdway, Colin Johnston, Barbara Maciejewska, Nicole Grobert

Department of Materials, University of Oxford, Oxford, OX1 3PH, United Kingdom

17:30 **ALD grown ZnMgO:Al on Si for photovoltaic applications: test solar cells performances for Mg content up to ~12% at.** **F.P.18**

J. Kurek (1,2), R. Schifano (1), S. Gierałtowska (1), Ł. Wachnicki (1), K. Kopalko (1), B. Witkowski (1), M. Godlewski (1), M. Pałowski (2), C. Jastrzębski (2)

1) Institute of Physics, Polish Academy of Sciences, Al. Lotników 32/46, PL-02 668 Warsaw, Poland 2) Faculty of Physics, Warsaw University of Technology, Al. Koszykowa 75, PL-00 662 Warsaw, Poland

17:30 **Tailoring properties of oxide thin films by pulsed laser depositions by plasma diagnostics: towards building a plasma –thin film relationship** **F.P.19**

Stefan Andrei Irimiciuc(1), Radu Udrea (1,2), Petronela Garoi(1), Petr Hruška(3), Martin Vondráček(3), Michal Novotný(3) Sergii Chertopalov(3), Jan Lancok(3), Valentin Craciun(1,4)

1National Institute for Laser, Plasma and Radiation Physics – NILPRP, 409 Atomistilor Street, Bucharest, Romania 2 Physics Faculty, University of Bucharest, Bucharest-Magurele, Romania 3Institute of Physics of the Czech Academy of Sciences, Na Slovance 1999/2, Prague, Czech Republic 4Extreme Light Infrastructure for Nuclear Physics, IFIN-HH, Magurele, Romania

WEDNESDAY, 21 SEPTEMBER 2022

Diamond and AlN: Joint session F and G : Ekaterine Chikoidze and Patrick Fiorenza

14:00 **Diamond: from material growth to power devices** **F.F&G.1**
David Eon

Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France

14:30 **Adsorption of aluminum and nitrogen at polar AlN surfaces – ab initio picture of AlN growth** **F.F&G.2**

Stanislaw Krukowski, Paweł Strak, Paweł Kempisty, Konrad Sakowski
Institute of High Pressure Physics PAS, Sokolowska 29/37, 01-142 Warsaw, Poland

15:00 **Polycrystalline diamond thin films for in vitro electrophysiological sensing devices** **F.F&G.3**

Henrique L. Gomes a), Milan C. Maradiya b), Rute Fă©lix c), Deborah M. Power c), Nă©dia E. Santos d), Filipe J. Oliveira e), Michael Liehr b), Susana S. Braga and Joana C. Mendes f)

a) Instituto de TelecomunicaĂşĂşes, Departamento de Engenharia Electrotă©cnica e de Computadores, Universidade de Coimbra, 3030-290 Coimbra, Portugal b) W&L Coating Systems GmbH, Bingenheimer Str. 32, D-61203 Reichelsheim, Germany c) Centro de CiĂşncias do Mar, Universidade do Algarve, 8005-139 Faro, Portugal d) LAQV-REQUIMTE, Department of Chemistry, University of Aveiro, 3810-193 Aveiro, Portugal e) CICECO, Department of Materials and Ceramic Engineering, University of Aveiro, 3810-193 Aveiro f) Instituto de TelecomunicaĂşĂşes e Departamento de Eletră©nica, TelecomunicaĂşĂşes e Informă©tica, Universidade de Aveiro, 3810-193 Aveiro, Portugal

- Development of thin GaN channel high electron mobility transistors on AIN bulk substrate** **F.F&G.4**
- 15:15 Reda Elwaradi, Catherine Bougerol, Jash Mehta, Maud Nemoz, Farid Medjdoub, Yvon Cordier

Exagan SAS, 190 chemin des fontaines, 38190 Bernin, France, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Nă©el, 38000 Grenoble, France, IEMN, CNRS, University of Lille, 59650 Villeneuve d'Ascq, France, Universită© Că©te dă©™Azur, CNRS, CRHEA, rue B. Gră©gory, 06560 Valbonne, France, IEMN, CNRS, University of Lille, 59650 Villeneuve d'Ascq, France, Universită© Că©te dă©™Azur, CNRS, CRHEA, rue B. Gră©gory, 06560 Valbonne, France

- 15:30 **coffee breack**

Gallium Oxide: Joint session F and G symposiums : Ekaterine Chikoidze and Patrick Fiorenza

- 16:00 **Disorder-induced ordering in Ga₂O₃ polymorphs** **F.F&G.5**
- A. Azarov, C. Baziotti, V. Venkatachalapathy, P. Vajeeston, E. Monakhov, A. Kuznetsov
- University of Oslo, Centre for Materials Science and Nanotechnology, POB1048 Blindern, 0316 Oslo, Norway

- 16:30 **Deep electron traps in Ćš-Ga₂O₃ crystal grown by floating zone** **F.F&G.6**
- Coralie Perrier, Yosra Mzali, Aboulaye Traoră©, Toshimitsu Ito, Hitoshi Umezawa, Etienne Gheeraert and Philippe Ferrandis

Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France, Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8571, Japan, Electronics and Photonics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki 305-8565, Japan, Advanced Power Electronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Osaka 563-8577, Japan, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France,

16:45 **Nanoindentation analysis of Ga₂O₃ thin membranes produced by ion implantation and irradiated with Argon**

F.F&G.7

M. Peres[1,2,3], I. Bdikin[4], J.C. Mendes[5],*, D. M. Esteves[1,3], D. R. Pereira[1,3], L. C. Alves[1,6], E. Alves[1,2], L. F. Santos[7], K. Lorenz[1,2,3]
 [1] DECN, Instituto Superior T  cnico, University of Lisbon, Bobadela 2695-066, Portugal, [2] IPFN, Instituto Superior T  cnico, University of Lisbon, Lisbon 1049-001, Portugal [3] INESC MN, Lisbon 1000-029, Portugal, [4] Department of Mechanical Engineering, University of Aveiro, Aveiro 3810-193, Portugal, [5] Instituto de Telecomunica  es e Departamento de Electr  nica, Telecomunica  es e Inform  tica, Universidade de Aveiro, Portugal, [6] C2TN, Instituto Superior T  cnico, University of Lisbon, Bobadela 2695-066, Portugal, [7] CQE, Institute of Molecular Sciences and Dept. of Chemical Engineering, Instituto Superior T  cnico, University of Lisbon, Lisbon 1049-001, Portugal,



Symposium G

Sessions: Room 306 | Main Building

Joint Sessions F&G: Room 306 | Main Building

Poster Session: Small Hall | Main Building

Wide-band-gap semiconductors:

New frontiers in wide-band-gap semiconductors and heterostructures for electronics, optoelectronics and sensing

Symposium Organizers: **Bela PECZ** Institute for Technical Physics and Materials Science Centre for Energy

Research, Hungarian Academy of Sciences (HAS-MTA) Hungary

Matteo MENEHINI University of Padova Italy

Patrick FIORENZA Consiglio Nazionale delle Ricerche – Institute for Microelectronics and Microsystems (CNR-IMM) Italy

Yvon CORDIER CRHEA-CNRS France

Symposium G Program

MONDAY, 19 SEPTEMBER 2022

2D-Materials : Bela Pecz

9:00 **2D Materials Heterostructures with Wide Band Gap Semiconductors** **G.01.01**

Rositsa Yakimova¹, Milena Beshkova², Kostas Sarakinos³, Filippo Giannazzo⁴,
Ivan Shteplyuk¹

¹ IFM, Linköping University, SE-58183 Linköping, Sweden, ² Institute of Electronics, BAN, 1784 Sofia, Bulgaria, ³ Department of Physics, University of Helsinki, FI-00014 Helsinki, Finland, ⁴ CNR-IMM, I-95121, Catania, Italy.

9:30 **Electrical monitoring of organic crystal phase transition using MoS₂ field effect transistor** **G.01.02**

Ilan Boulet, Simon Pascal, Frederic Bedu, Igor Ozerov, Alain Ranguis, Thomas Leoni, Conrad Becker, Laurence Masson, Aleksandar Matkovic, Christian Tiechert, Olivier Siri, Jean-Roch Huntzinger, Matthiru Paillet, Ahmed Zahab, Romain Parret
AMU

9:45 **Development of the Far-Field PL emission from a Quantum Well during its Field Evaporation in an APT** **G.01.03**

E. M. Weikum (a), G. Beainy (a), J. Houard (a), S. Moldovan (a), J. M. Chauveau (b,c), M. Hugues (b), D. Lefebvre (b), A. Vella (a), L. Rigutti (a)

(a) UNIROUEN, CNRS, Groupe de Physique des Matériaux, Normandie Université, 76000 Rouen, France, (b) Université Côte d'Azur, CNRS, CRHEA, 06560 Valbonne, France, (c) Groupe d'Étude de la Matière Condensée, UMR 8635 CNRS, Université Versailles St Quentin/Paris Saclay. 78000 Versailles, France

10:00 **2D MoS₂ ionizing radiation and thermal vulnerability** **G.01.04**

S. Agnello^{1,2,3}, S.E. Panasci², A. Alessi⁴, S. Mazzeo¹, E. Schiliro^{1,2}, F. Giannazzo², G. Buscarino¹, M. Cannas¹, F.M. Gelardi¹

1) Department of Physics and Chemistry Emilio SegreTM, University of Palermo, Via Archirafi 36, 90123 Palermo, Italy 2) Institute for Microelectronic and Microsystems (CNR-IMM), Z.I. VIII Strada 5, 95121 Catania, Italy 3) AtenCenter, University of Palermo, Viale delle Scienze Ed.18, 90128 Palermo, Italy 4) LSI, CEA/DRF/IRAMIS, CNRS, Ecole polytechnique, Institut Polytechnique de Paris, 91120 Palaiseau, France

10:15 **Structural and electrical properties of ultra-thin MoS₂ films obtained by MoO₃ sulfurization on SiO₂, sapphire and 4H-SiC** **G.01.05**

S. E. Panasci (1,2), E. Schilir^Å (1), A. Koos (3), M. Nemeth (3), A. Sulyok (3), S. Di Franco (1), G. Greco (1), P. Fiorenza (1), M. Cannas (4), F. M. Gelardi (4), S. Agnello (1,4,5), F. Roccaforte (1), B. P^Åcz (3), F. Giannazzo (1).

(1) CNR-IMM, Strada VIII, 5 95121, Catania, Italy, (2) Department of Physics and Astronomy, University of Catania, Via Santa Sofia 64, 95123 Catania, Italy, (3) Centre for Energy Research, Institute of Technical Physics and Materials Science, Konkoly-Thege ut 29-33, 1121 Budapest, Hungary, (4) Department of Physics and Chemistry, University of Palermo, Via Archirafi 36, 90123 Palermo, Italy, (5) AteN Center, University of Palermo, Viale delle Scienze 18/A, 90128 Palermo, Italy,

10:30 **Break**

2D-Materials II : Simonpietro Agnello

11:00 **Current injection in highly uniform MoS₂ heterojunctions with hexagonal wide bandgap semiconductors (SiC and GaN)** **G.02.01**

F. Giannazzo (1,*), S. E. Panasci (1,2), E. Schilir^Å (1), G. Greco (1), P. Fiorenza (1), F. Roccaforte (1), M. Cannas (3), S. Agnello (1,3,4), A. Michon (5), M. Al Khalfioui (5), E. Frayssinet (5), Y. Cordier (5), A. Koos (6), B. Pecz (6), M. Spankova (7), S. Chromik (7)

(1) CNR-IMM, Strada VIII, 5 95121, Catania, Italy (2) Department of Physics and Astronomy, University of Catania, Via Santa Sofia 64, 95123 Catania, Italy (3) Department of Physics and Chemistry Emilio Segrè, University of Palermo, Via Archirafi 36, 90143 Palermo, Italy (4) AtenCenter, University of Palermo, Viale delle Scienze Ed.18, 90128 Palermo, Italy (5) Université Ca'te d'Azur, CNRS, CRHEA, 06560, Valbonne, France (6) Centre for Energy Research, Institute of Technical Physics and Materials Science, Konkoly-Thege ut 29-33, 1121 Budapest, Hungary (7) Institute of Electrical Engineering SAS, Dubravská cesta 9, 841 04 Bratislava, Slovakia *E-mail: filippo.giannazzo@imm.cnr.it

11:15 Microscopy of MoS2 layers grown onto graphene/SiC templates

G.02.02

B. Pácz1, A. Koos1, M. Nemeth1, S.E. Panasci2, E. Schiliró2, S. Agnello2,3, M. Cannas3, C. Mastropasqua,4 A. Michon4, Y. Cordier4, F. Giannazzo2

1Centre for Energy Research, Institute of Technical Physics and Materials Science, Konkoly-Thege ut 29-33, 1121 Budapest, Hungary 2CNR-IMM, Strada VIII, 5 95121, Catania, Italy 3Department of Physics and Chemistry Emilio Segrè, University of Palermo, Via Archirafi 36, 90123 Palermo, Italy 4Université Ca'te d'Azur, CNRS, CRHEA, 06560 Valbonne, France

11:30 UNIFORM CVD OF GRAPHENE ON 2" SiC WAFER

G.02.03

C. Mastropasqua, M. Cannas, S. Agnello, S. Ethan Panasci, F. Giannazzo, M. Portail, A. Reserbat-Plantey, M. Koudia, M. Abel, I. Berbezier, A. Michon

Université Ca'te d'Azur, CNRS-CRHEA, Valbonne, France , Dipartimento di Fisica e Chimica Emilio Segrè, University of Palermo, Palermo, Italy , AtenCenter, University of Palermo, Palermo, Italy, CNR-IMM, Catania, Italy , CNR-IMM, Catania, Italy , Université Ca'te d'Azur, CNRS-CRHEA, Valbonne, France , Université Ca'te d'Azur, CNRS-CRHEA, Valbonne, France , Aix-Marseille Université, CNRS-IM2NP, Marseille, France , Aix-Marseille Université, CNRS-IM2NP, Marseille, France , Aix-Marseille Université, CNRS-IM2NP, Marseille, France , Université Ca'te d'Azur, CNRS-CRHEA, Valbonne, France ,

11:45 Nanocomposites of various types filled with luminescent oxides

G.02.04

Serhii G. Nedilko

Taras Shevchenko National University of Kyiv

Engineering interlayer electron-phonon coupling in WS₂/BN heterostructures

12:00

G.02.05

Yifei Li, Xiaowei Zhang, Jinhuan Wang, Xiaoli Ma, Jin-An Shi, Xiangdong Guo, Yonggang Zuo, Ruijie Li, Hao Hong, Ning Li, Kai Xu, Xinyu Huang, Huifeng Tian, Ying Yang, Zhixin Yao, PeiChi Liao, Xiao Li, Junjie Guo, Yuang Huang, Peng Gao, Lifan Wang, Xiaoxia Yang, Qing Dai, EnGe Wang, Kaihui Liu, Wu Zhou, Xiaohui Yu, Liangbo Liang, Ying Jiang, Xin-Zheng Li, Lei Liu

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Research Center for Light-Element Advanced Materials, Peking University, Beijing 100871, China, Lei Liu--School of Materials Science and Engineering, Interdisciplinary Institute of Light-Element Quantum Materials and Research Center for Light-Element Advanced Materials, Peking University, Beijing 100871, China,

12:15 **Enhanced Photoresponse of Multilayer WS₂ Nanosheets based highly responsive broadband organic phototransistors** **G.02.06**

Rajdeep Banerjee¹, Priyanka Rani², Ajoy Mandal¹, Samik Mallik², Shiv Prakash Verma², Riya Sadhukhan¹, Sovonlal Mondal², Dipak Kumar Goswami¹

¹ Organic Electronics Laboratory, Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur – 721302, India ² School of Nanoscience and Technology, Indian Institute of Technology Kharagpur, Kharagpur – 721302, India

12:30 **Lunch**

III-Nitrides Growth and Characterization : Yvon Cordier

14:00 **Plasma-Assisted Molecular Beam Epitaxy of novel III-Nitride heterostructure and nanostructure materials** **G.03.01**

Alexandros Georgakilas

Foundation for Research and Technology-Hellas (FORTH) and University of Crete IESL and Department of Physics Microelectronics Research Group

14:30 **Application of the photonic atom probe to the study of thick III-Nitride semiconductor heterostructures** **G.03.02**

A. Diaz Damian¹, E. M. Weikum¹, J. Houard¹, G. Da Costa¹, F. Delaroche¹, G. Muziol², H. Turski², A. Vella¹, L. Rigutti¹

¹ UNIROUEN, CNRS, Groupe de Physique des Matériaux, Normandie Université, 76000 Rouen, France. ² Institute of High Pressure Physics of the Polish Academy of Sciences – UNIPRESS, 01-142, Warszawa, Poland

14:45 **Study of nanoscale GaN coalescence by synchrotron X-ray diffraction** **G.03.04**

M. Wehbe, K. Baril, C. Gourgon, B. Alloing, J. Zuniga-Perez, M. Charles, D. Pino Munoz, P. Gergaud

M. Wehbe : Univ. Grenoble Alpes, CEA, LETI, 38000 Grenoble, France and MINES Paris, PSL Univ., Centre de mise en forme des matériaux (CEMEF), CNRS, CS 10207 rue Claude Daunesse, 06904 Sophia Antipolis, France , K. Baril : Univ. C te d'Azur, CRHEA-CNRS, Rue Bernard Gregory, 06560 Valbonne, France , C. Gourgon : Univ. Grenoble Alpes, CNRS LTM, 17 Rue Des Martyrs, 38054 Grenoble, France , B. Alloing : Univ. C te d'Azur, CRHEA-CNRS, Rue Bernard Gregory, 06560 Valbonne, France , J. Zuniga-Perez : Univ. C te d'Azur, CRHEA-CNRS, Rue Bernard Gregory, 06560 Valbonne, France , M. Charles : Univ. Grenoble Alpes, CEA, LETI, 38000 Grenoble, France , D. Pino Munoz : MINES Paris, PSL Univ., Centre de mise en forme des matériaux (CEMEF), CNRS, CS 10207 rue Claude Daunesse, 06904 Sophia Antipolis, France , P. Gergaud : Univ. Grenoble Alpes, CEA, LETI, 38000 Grenoble, France ,

15:00 **Tracing the Growth and Fabrication Process of Ammonothermal GaN Substrates by Laboratory X-ray Topography** **G.03.05**

L. Kirste^{1,*}, R. Kucharski², K. Grabianska², T. Sochacki², B. Lucznik², M. Bockowski²

¹Fraunhofer Institute for Applied Solid State Physics (IAF), Freiburg, Germany

²Institute of High Pressure Physics (UNIPRESS), Polish Academy of Sciences, Warsaw, Poland

15:15 **An advanced Bragg diffraction imaging technique to characterize defects in GaN** **G.03.06**

Thu Nhi TRAN CALISTE⁽¹⁾, Lutz KIRSTE⁽²⁾, Jos   BARUCHEL⁽¹⁾

⁽¹⁾ European Synchrotron Radiation Facility (ESRF), Grenoble, France ⁽²⁾

Fraunhofer Institute for Applied Solid State Physics (IAF), Freiburg, Germany

15:30 **Break**

III-Gallium Nitride HEMTs : Alexandros Georgakilas

16:00 **Effect of traps on thin buffer AlGaIn/GaN HEMT by DC and RF characterization** **G.04.01**

Jagori Raychaudhuri, Jayjit Mukherjee, Rajesh Bag, D. S. Rawal, Meena Mishra, Santanu Ghosh

Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India, Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India, Solid State Physics Laboratory, DRDO, Timarpur, New Delhi, 110054, India, Solid State Physics Laboratory, DRDO, Timarpur, New Delhi, 110054, India, Solid State Physics Laboratory, DRDO, Timarpur, New Delhi, 110054, India, Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India

16:15 **Normally-Off AlGa_N/Ga_N HEMTs based on selective area regrowth of a P-GaN gate in nanostructured patterns** **G.04.02**

Daniel ROULY, Patrick AUSTIN, Josiane TASSELLI, Frédéric MORANCHO, Karine ISOIRD, Julien BRAULT, Yvon CORDIER

Daniel ROULY, LAAS-CNRS, Université de Toulouse, CNRS, UPS, Toulouse, France, Patrick AUSTIN, LAAS-CNRS, Université de Toulouse, CNRS, UPS, Toulouse, France, Josiane TASSELLI, LAAS-CNRS, Université de Toulouse, CNRS, UPS, Toulouse, France, Frédéric MORANCHO, LAAS-CNRS, Université de Toulouse, CNRS, UPS, Toulouse, France, Karine ISOIRD, LAAS-CNRS, Université de Toulouse, CNRS, UPS, Toulouse, France Julien BRAULT, Université Côte d'Azur, CNRS, CRHEA, France, Yvon CORDIER, Université Côte d'Azur, CNRS, CRHEA, France

16:30 **Performance improvement with non-alloyed ohmic contacts technology on AlGa_N/Ga_N HEMTs on 6H-SiC substrate** **G.04.03**

Marie Lesecq, Yassine Fouzi, Ali Abboud, Nicolas Defrance, François Vaurette, Saliha Ouendi, Etienne Okada, Marc Portail, Micka Bah, Daniel Alquier, Jean-Claude De Jaeger, Eric Frayssinet, Yvon Cordier

Marie Leseq, Yassine Fouzi, Ali Abboud, Nicolas Defrance, François Vaurette, Saliha Ouendi, Etienne Okada, Jean-Claude De Jaeger, are from Univ. Lille, CNRS, Centrale Lille, Univ. Polytechnique Hauts-de-France, UMR 8520 "IEMN-Institut d'Electronique de Microelectronique et de Nanotechnologie, F-59000, Lille, France, Marc Portail, Eric Frayssinet, Yvon Cordier are from Université Ca'te d'Azur, CNRS, CRHEA, rue B.Gratory, 06560 Valbonne, France, Micka Bah, Daniel Alquier are from GREMAN, Université de Tours, INSA Centre Val de Loire, 37071 Tours, France

16:45 **Influence of electron and hole trapping in threshold voltage instability for normally-off p-GaN HEMTs** **G.04.04**

G. Greco 1*, P. Fiorenza 1, F. Giannazzo 1, C. Bongiorno 1, M. Moschetti 2, C. Bottari 2, S. Alessandrino 2, F. Iucolano 2, F. Roccaforte1

1 CNR-IMM, Strada VIII, n. 5 "Zona Industriale, 95121 Catania, Italy, 2 STMicroelectronics, Stradale Primosele 50, 95121 Catania, Italy

17:00 **Electrical and optical investigation on defect generation from thermal storage test on AlGaIn/GaN HEMTs** **G.04.05**

Jayjit Mukherjee, Rupesh K. Chaubey, D.S. Rawal, R.S. Dhaka

Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India, Solid State Physics Laboratory, DRDO, Timarpur, New Delhi, 110054, India, Solid State Physics Laboratory, DRDO, Timarpur, New Delhi, 110054, India, Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India

Poster 1 : Ferdinando Iucolano

17:30 **Assessing the morphological and electrical properties in 200mm-size 4H-SiC wafer** **G.P1.1**

M. Vivona 1, P. Fiorenza 1, M. Mauceri 2, V. Scuderi 1, F. La Via 1, F. Giannazzo 1, A.A. Messina 1,3, M. Azadmand 2, D. Crippa 4, F. Roccaforte 1

(1) CNR-IMM, Strada VIII n.5, Zona Industriale, I-95121, Catania, Italy, (2) LPE, XVI Strada, Zona Industriale, I-95121 Catania, Italy, (3) STMicroelectronics, Stradale Primosole 50, I-95121, Catania, Italy, (4) LPE Spa, Via Falzarego, 8, I-20021 Baranzate, Italy.

17:30 **Structural and electrical properties AlGaIn/GaN heterostructures grown onto misoriented 4H-SiC epilayers** **G.P1.2**

F. Roccaforte 1, G. Greco 1, C. Bongiorno 1, P. Fiorenza 1, F. Giannazzo 1, M. Mauceri 2, D. Crippa 2, P. Prystawko 3, M. Leszczynski 3

1 CNR-IMM, Strada VIII, n. 5 " Zona Industriale, 95121 Catania, Italy, 2 LPE, Strada XVI " Zona Industriale, 95121 Catania, Italy, 3 Institute of High Pressure Physics - PAS, Sokolowska 29/37, Warsaw 01-152, Poland

17:30 **Enhanced Ti/Al/Ti Ohmic contacts on AlGaIn/GaN heterostructures** **G.P1.3**

G. Greco 1*, S. Di Franco 1, R. Lo Nigro 1, M. Spera 2, P. Badalá 2, F. Iucolano 2, F. Roccaforte 1

1 CNR-IMM, Strada VIII, n. 5 " Zona Industriale, 95121 Catania, Italy, 2 STMicroelectronics, Stradale Primosole 50, 95121 Catania, Italy

17:30 **Study of Ron degradation mechanisms for a p-GaN 650 V Power HEMT under HTRB stress** **G.P1.4**

Giovanni Giorgino, Cristina Miccoli, Maurizio Moschetti, Maria Eloisa Castagna, Alessandro Chini, Ferdinando Iucolano

STMicroelectronics, STMicroelectronics, STMicroelectronics, STMicroelectronics, University of Modena and Reggio Emilia, STMicroelectronics

17:30 **Study of Pt Schottky contacts on bulk cubic silicon carbide (3C-SiC)** **G.P1.5**

F. Roccaforte1, G. Greco1, P. Fiorenza1, S. Di Franco1, F. Giannazzo1, F. La Via1, M. Zielinski2, H. Mank2, V. Jokubavicius3, R. Yakimova3

1 CNR-IMM, Strada VIII n.5, Zona Industriale, I-95121, Catania, Italy, 2 NOVASiC, Savoie Technolac, BP267, F-73375 Le Bourget-du-Lac Cedex, France, 3 IFM, Linköping University, SE-58183 Linköping, Sweden

17:30 **Current transport investigation in ultra-thin AlN epitaxial layer grown by PE-ALD on GaN** **G.P1.6**

E. Schilir , 1, F. Giannazzo1, S. Di Franco1, G. Greco1, P. Fiorenza1, F. Roccaforte1, P. Prystawko2, P. Kruszewski2, M. Leszczynski2, I. Cora 3, B. P  cz 3, Z. Fogarassy 3, R. Lo Nigro1

(1) CNR-IMM, Strada VIII, 5 95121, Catania, Italy, (2) TopGaN, Warsaw, Poland, (3) MTA-HAS, Budapest, Hungary,

17:30 **Deposited oxides onto 3C-SiC/Si: a route toward ideal MOS capacitor behaviour** **G.P1.7**

P. Fiorenza1, L. Maiolo2, G. Fortunato2, E. Schilir , 1, R. Lo Nigro1, S. Di Franco1, M. Zielinski3, F. La Via1, F. Giannazzo1, F. Roccaforte1.

1) CNR-IMM, Strada Ottava 5 â   Zona Industriale â   95121 Catania, Italy 2) CNR-IMM, Via del Fosso del Cavaliere 100, 00133 - Roma, Italy 3) NOVASiC, Savoie Technolac, BP267, F-73375 Le Bourget-du-Lac Cedex, France

17:30 **Analysis of self-heating effects in high electron mobility transistors using micro-Raman thermometry** **G.P1.8**

Nora Siebdrath, Christian R   der, Alexander Schmid, Johannes Heitmann

Institute of Applied Physics, TU Bergakademie Freiberg, Leipziger Str. 23, D-09599 Freiberg, Germany, Institute of Applied Physics, TU Bergakademie Freiberg, Leipziger Str. 23, D-09599 Freiberg, Germany, Institute of Applied Physics, TU Bergakademie Freiberg, Leipziger Str. 23, D-09599 Freiberg, Germany, Institute of Applied Physics, TU Bergakademie Freiberg, Leipziger Str. 23, D-09599 Freiberg, Germany

17:30 **Frequency characteristic analysis of channel electrons captured by AlGaIn crystal defects in GaN-based HEMTs** **G.P1.9**

Yuki SHIMIZU, Takuma KATOU, Atsuya HUZIWARA, Haruki HAYASHI, Hirohisa TAGUCHI

Department of Electrical and Electronic Engineering, Graduate School of Engineering, Chukyo University

- 17:30 **TEM structural characterization of AZO layers deposited by sputtering on Ga and N polar GaN substrates** **G.P1.10**
- Zsolt Fogarassy¹, János Lőrincz¹, Aleksandra Wójcik², Tatyana Kravchuk³, Eliana Kamińska⁴, Piotr Perlin⁴, Szymon Grzanka⁵ and Michał A. Borysiewicz²
- 1 Inst. for Techn. Physics and Mater. Science, Centre for Energy Research, Budapest, Hungary 2 Łukasiewicz Research Network – Institute of Microelectronics and Photonics, Warsaw, Poland 3 Technion - Israel Institute of Technology, Haifa, Israel 4 Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland 5 TOP-GAN, Warsaw, Poland
- 17:30 **Defect characterisation in HVPE-grown GaN using optical spectroscopy** **G.P1.11**
- A. Hirsch(1), C. Röhder(1,2), G. Lukin(1), U. Blöchl(1), F. Zimmermann(2), D. Bastin(3), P. Hofmann(3), R. Doradzinski(3), E. Meißner(1), F. Beyer(1), J. Friedrich(1)
- (1) Fraunhofer Institute for Integrated Systems and Device Technology IISB, Schottkystraße 10, 91058 Erlangen, Germany (2) Institute of Applied Physics, TU Bergakademie Freiberg, Leipziger Str. 23, 09599 Freiberg, Germany (3) Freiburger Compound Materials GmbH, Am Junger-Löwe-Schacht 5, 09599 Freiberg, Germany
- 17:30 **Frequency dependence of current collapse phenomenon in AlGaIn / GaN-based HEMT structures** **G.P1.12**
- Takuma. Kato, Atuya. Hujiwara, Yuki Shimizu, Kent Kondo, Hirohisa Taguchi
Department of Electrical and Electronic Engineering, Graduate School of Engineering, Chukyo University
- 17:30 **Evaluation of AlGaIn / GaN-based HEMT structure crystal defects by UV light receiving performance** **G.P1.13**
- Shuto Arinaga, Takuma Kato, Hirohisa Taguchi
Department of Electrical and Electronic Engineering, Graduate School of Engineering, Chukyo University
- 17:30 **Charge trapping phenomena in Al₂O₃ on GaN-based materials** **G.P1.14**

P. Fiorenza, E. Schilir , G. Greco, S. Di Franco, F. Giannazzo, R. Lo Nigro, F. Roccaforte

Consiglio Nazionale delle Ricerche – Istituto per la Microelettronica e Microsistemi (CNR-IMM), Strada VIII, 5 - Zona Industriale, 95121 Catania, Italy

17:30 **Correlation between threshold voltage instability and interface chemistry in nitridated SiO₂/4H-SiC MOSFET** **G.P1.15**

P. Fiorenza¹, C. Bongiorno¹, M. Saggio², F. Giannazzo¹, F. Roccaforte¹

¹ CNR-IMM, Strada VIII 5 95121, Catania, Italy ² STMicroelectronics Stradale Primosole 50 95121, Catania, Italy

17:30 **Electronic properties of wide-band-gap semiconductors resolved by low energy q-EELS, an ab-initio study** **G.P1.16**

Dario A. Leon (1), Cana Elgvin (2), Phuong Nguyen (2), Fredrik Sydow Hage (2), År ystein Prytz (2) and Kristian Berland (1)

(1) Norwegian University of Life Sciences, Norway, (2) University of Oslo, Norway

17:30 **Impact of Carrot-like defects in 4H-SiC PowerMOSFETs** **G.P1.17**

B. Carbone (1), S. Alessandrino (1), E. Vitanza (1), E. Fontana (1), A. Russo (1), P. Fiorenza (2), F. Giannazzo (2), F. Roccaforte (2)

(1) - STMicroelectronics, Stradale Primosole 50, I-95121 Catania, Italy (2) - Consiglio Nazionale delle Ricerche – Istituto per la Microelettronica e Microsistemi (CNR-IMM), Strada VIII, n.5 Zona Industriale, I-95121 Catania, Italy

17:30 **Electrical properties of AlGa_N/Ga_N HEMTs with incorporated MoS₂ film in Gate electrode** **G.P1.18**

Gabriel Vanko, Marianna Ĺpankov , Jana Hrd , Tibor Izs k, Mari n Varga, Michaela Sojkov , Maro  Gregor, Ĺtefan Chromik

Institute of Electrical Engineering, Slovak Academy of Sciences, Džuravská
cesta 9, 841 04 Bratislava, Slovakia G. Vanko, M. Ľ. Pankov, J. Hrdá, T.
Izsák, M. Varga, M. Sojková, Ľ. Chromík ----- Faculty of Mathematics, Physics
and Informatics of Comenius University, Mlynská dolina F1, 842 48 Bratislava,
Slovakia M. Gregor,

17:30 **Dynamic characterization of SiC thyristors with amplifying gate design** **G.P1.19**

K. Kotra (1), S. Scharnholtz (1), R. Hassdorf (1), L.V. Phung (2), D. Planson (2)

(1) French-German Research Institute of Saint-Louis (ISL), 5 rue du Général Cassagnou, 68300 Saint-Louis, France. (2) Univ. Lyon, INSA Lyon, Université Claude Bernard Lyon 1, Ecole Centrale de Lyon, CNRS, AMPERE, 69621 Lyon, France.

17:30 **p-type doping of free standing 3C-SiC by Al ion implantation** **G.P1.20**

Marica Canino, Virginia Boldrini, Frank Torregrosa, Marcin Zielinski, Francesco La Via

CNR-IMM UOS Bologna, Via Piero Gobetti 1010, I-40129 Bologna, Italy, CNR-IMM UOS Bologna, Via Piero Gobetti 1010, I-40129 Bologna, Italy, Ion Beam Services, ZI de Peynier Rousset, Rue Gaston Imbert prolongée, F-13790 Peynier, France, NOVASiC, Savoie Technolac, Arche Bat 4, BP267, 73375 Le Bourget du Lac, France, CNR-IMM UOS Bologna, Via Piero Gobetti 1010, I-40129 Bologna, Italy, CNR-IMM UOS Catania, VIII Strada, 5, I-95121 Catania, Italy

17:30 **2D-imaging of critical structures inside 4H-SiC MOSFETs by scanning capacitance microscopy** **G.P1.21**

P. Fiorenza (1), M. S. Alessandrino (2), B. Carbone (2), A. Russo (2), F. Roccaforte (1), F. Giannazzo (1,*)

(1) CNR-IMM, Strada VIII 5 95121, Catania, Italy (2) STMicroelectronics Stradale Primosole 50 95121, Catania, Italy * email: filippo.giannazzo@imm.cnr.it

17:30 **Electrical characterization of W-based Schottky barrier on 4H-SiC** **G.P1.22**

M. Vivona¹, G. Bellocchi², G. Greco¹, S. Di Franco¹, M. Saggio², S. Rascunà², F. Roccaforte¹

¹ CNR-IMM, Strada VIII n.5, Zona Industriale, I-95121, Catania, Italy ² STMicroelectronics, Stradale Primosole 50, I95121, Catania, Italy

17:30 **Epitaxy of Boron Nitride on sapphire** **G.P1.23**

Kinga Kosciwicz 1*, Jaroslaw Gaca1, Ewelina B. Mozdzyńska1, Karolina Pietak1, Jakub Jagiello1, Artur Dobrowolski1, Marcin Mysliwiec2, Marcin Juchniewicz2, Maciej Kozubal, Dariusz Czolak1, Ewa Dumiszewska1 *presenting author

1) Ł,ukasiewicz IMIF, 2) CEZAMAT Warsaw University of Technology
Gallium Oxide (Ga2O3) on Silicon Carbide (SiC) for Hybrid Quantum Devices **G.P1.25**
 17:30 C. Sartel1, E. Chikoidze1, Soroush Abbasi Zargaleh1,2*

1Groupe d'Etude de la Matière Condensée (GEMaC), Université Paris-Saclay, UVSQ CNRS, Versailles, France 2 Sorbonne Université, UPMC Université Paris 06, CNRS-UMR 7588, Institut des NanoSciences de Paris, Paris, France * E-mail: alain-soroush.abbasi-zargaleh@uvsq.fr

17:30 **Structural and optical properties of BGaN epitaxial layers** **G.P1.26**

Ewelina B. Mozdzyńska1,4, Krzysztof P. Korona2, Sebastian Zlotnik3, Jaroslaw Gaca1, Paweł P. Michałowski1, Roman Kozłowski1, Paweł Kamiński1, Elżbieta Jezierska4, and Jacek M. Baranowski1

1Ł,ukasiewicz Institute of Microelectronics and Photonics, al. Lotników 32/46, 02-668 Warsaw, Poland 2University of Warsaw, Faculty of Physics, Ludwika Pasteura 5, 02-093 Warsaw, Poland Advances 3Military University of Technology, Institute of Applied Physics gen. Sylwestra Kaliskiego 2, 00-908 Warsaw, Poland 4Warsaw University of Technology, Faculty of Materials Science and Engineering, Wołoska 141, 02-507 Warsaw, Poland

TUESDAY, 20 SEPTEMBER 2022

SiC Devices I : Daniel Alquier

9:00 **Methods for controlling 4H-SiC Schottky Barrier** **G.06.01**
 S. Rascuna
 STMicroelectronics SRL

9:30 **Al2O3/AlN dielectric nanobilayers for 4H-SiC based devices** **G.06.02**

B. Galizia(1), E. Schilir  (1), G. Greco(1), S. Di Franco(1), G. Radnoczi(2), Z. Fogarassy(2), B. Pecz(2), A. Severino(3), M. Saggio(3), P. Fiorenza(1), F. Giannazzo(1), F. Roccaforte(1), R. Lo Nigro(1)

1)Consiglio Nazionale delle Ricerche â€ Istituto per la Microelettronica e Microsistemi (CNR-IMM), Strada Ottava, n5 â€ Zona Industriale â€ 95121 Catania, 2)Centre for Energy Research, Institute of Technical Physics and Materials Science, Konkoly-Thege ut 29-33, 1121 Budapest, Hungary, 3) STMicroelectronics, Stradale Primosole, n50 â€ 95121 Catania,

9:45 **Details on the surface roughening occurring in Al ion implanted 4H-SiC annealed under a C-cap** **G.06.03**
M. Canino, F. Corticelli, F. Mancarella, C. Albonetti

CNR-IMM UOS Bologna, Via Piero Gobetti 101, I-40129 Bologna, CNR-IMM UOS Bologna, Via Piero Gobetti 101, I-40129 Bologna, CNR-IMM UOS Bologna, Via Piero Gobetti 101, I-40129 Bologna, CNR-ISMN UOS Bologna, Via Piero Gobetti 101, I-40129 Bologna, CNR-IMM UOS Bologna, Via Piero Gobetti 101, I-40129 Bologna.

10:00 **Effects of pulsed XeCl-laser irradiation on the properties of Al-implanted 4H-SiC layers** **G.06.04**

Vivona M. (1), Giannazzo F. (1), Bellocchi G. (2), Panasci S. E. (1,3), Agnello S. (1,3,4), Badal  P. (2), Bassi A. (2), Bongiorno C. (1), Di Franco S. (1), Rascun  S. (2), Roccaforte F. (1)

(1) CNR-IMM, Strada VIII n.5, Zona Industriale, I-95121, Catania, Italy (2) STMicroelectronics, Stradale Primosole 50, I-95121, Catania, Italy (3) Department of Physics and Astronomy, University of Catania, Via Santa Sofia 64, I-95123 Catania, Italy (4) Department of Physics and Chemistry Emilio Segr , University of Palermo, via Archirafi 36, I-90123 Palermo, Italy (5) ATEN Center, University of Palermo, Viale delle Scienze Ed. 18, I-90128 Palermo, Italy

10:15 **Combined I-V and C-V method for accurate interface state density and effective channel mobility evaluation in lateral 4H-SiC MOS** **G.06.05**
Antonio Valletta, Fabrizio Roccaforte, Antonino La Magna, Guglielmo Fortunato, Patrick Fiorenza

Antonio Valletta and Guglielmo Fortunato are with IMM-CNR Roma section, via del Fosso del Cavaliere 100, 00133 Roma, Italy Fabrizio Roccaforte, Antonino La Magna, and Patrick Fiorenza are with IMM-CNR Catania section, III Strada 5, 95121 Catania, Italy

10:30 **Break**

SiC Materials II : Simone Rascună

11:00 **Micro-Raman evaluation of 200mm SiC material**

G.07.01

Nicolo Piluso Egidio Carria Andrea Severino
STMicroelectronics

11:15 **Study of SiC by atom probe tomography: influence of molecular effects and surface dynamics, consequence for compositional analysis**

G.07.02

S. Ndiaye (a), C. Bacchi (a), B. Klaes (a), M. Canino (), F. Vurpillot (a), L. Rigutti (a)

(a) UNIROUEN, CNRS, Groupe de Physique des Matériaux, Normandie Université, 76000 (b) CNR-IMM, Via Piero Gobetti 101, I-40129 Bologna, Italy

11:30 **Advanced approach of (111) 3C-SiC epitaxial growth**

G.07.03

Cristiano Calabretta (1), Viviana Scuderi (1), Corrado Bongiorno (1), Ruggero Anzalone (2), Annalisa Cannizzaro (1), Marco Mauceri (3), Danilo Crippa (4), Simona Boninelli (1), and Francesco La Via (1)

(1) CNR-IMM, VIII Strada, 5, 95121 Catania, Italy, (2) STMicroelectronics, Stradale Primosole 50, 95121 Catania, Italy, (3) LPE, Strada XVI, Catania, Italy, (4) LPE, via Falzarego 8 Baranzate (MI), Italy,

11:45 **Residual stress distribution of 3C-SiC double clamped beams by micro-Raman spectroscopy**

G.07.04

V. Scuderi (1), L. Belsito (2), M. Ferri (2), S. Sapienza (2), A. Roncaglia (2), M. Zielinski (3), F. La Via (1)

(1) CNR-IMM, VIII Strada, 5, 95121 Catania, Italy, (2) CNR-IMM Bologna Via Gobetti 101, 40129 Bologna, Italy, (3) NOVASiC, Savoie Technolac, Arche Bat 4, BP267, 73375 Le Bourget du Lac Cedex, France

12:00 **Development of n-type epitaxial growth on 200 mm 4H-SiC wafers for the next generation of power devices** **G.07.06**

Mattia Musolino, Mani Azadmand, Egidio Carria, Mathias Isacson, Danilo Crippa, Silvio Preti, Marco Mauceri, Michele Calabretta, Angelo Messina

STMicroelectronics S.p.A, LPE, STMicroelectronics S.p.A, STMicroelectronics Silicon Carbide AB, LPE, LPE, LPE, STMicroelectronics S.p.A, STMicroelectronics S.p.A

12:15 **Lunch**

III-Nitrides LEDs : Giuseppe Greco

14:00 **DLTS-based defect analysis in UV-C single QW LEDs during a constant current stress** **G.08.01**

F. Piva 1*, M. Buffolo 1, C. De Santi 1, M. Pilati 1, N. Roccato 1, N. Susilo 2, M. Guttman 2, L. Sulmoni 2, T. Wernicke 2, M. Kneissl 2, G. Meneghesso 1, E. Zanoni 1, M. Meneghini 1

1 Department of Information Engineering, University of Padua, Padova, Italy, 2 Technische Universität Berlin, Institute of Solid State Physics, Berlin, Germany

14:15 **Discriminating the effects of deep-levels in InGaN/GaN LEDs: impact on forward leakage current** **G.08.02**

Matteo Buffolo, Nicola Roccato, Francesco Piva, Carlo De Santi, Camille Haller, Jean-François Carlin, Nicolas Grandjean, Marco Vallone, Alberto Tibaldi, Francesco Bertazzi, Michele Goano, Giovanni Verzellesi, Gaudenzio Meneghesso, Enrico Zanoni, Matteo Meneghini
Dipartimento di Ingegneria dell'Informazione, Università di Padova, via Gradenigo 6/B, Padova 35131, Italy, Dipartimento di Ingegneria dell'Informazione, Università di Padova, via Gradenigo 6/B, Padova 35131, Italy, Dipartimento di Ingegneria dell'Informazione, Università di Padova, via Gradenigo 6/B, Padova 35131, Italy, Dipartimento di Ingegneria dell'Informazione, Università di Padova, via Gradenigo 6/B, Padova 35131, Italy, Institute of Physics, School of Basic Sciences, Ecole Polytechnique fédération de Lausanne (EPFL), CH-1015 Lausanne, Switzerland, Institute of Physics, School of Basic Sciences, Ecole Polytechnique fédération de Lausanne (EPFL), CH-1015 Lausanne, Switzerland, Institute of Physics, School of Basic Sciences, Ecole Polytechnique fédération de Lausanne (EPFL), CH-1015 Lausanne, Switzerland, Politecnico di Torino, Corso Duca degli Abruzzi, 24, 10129

Torino, ITALY, Politecnico di Torino, Corso Duca degli Abruzzi, 24, 10129 Torino, ITALY, Politecnico di Torino, Corso Duca degli Abruzzi, 24, 10129 Torino, ITALY, Politecnico di Torino, Corso Duca degli Abruzzi, 24, 10129 Torino, ITALY, Dipartimento di Scienze e Metodi dell'Ingegneria and Centro En&tech, Università di Modena e Reggio Emilia, via Amendola 2, Pad. Morselli, 42122 Reggio Emilia, Italy, Dipartimento di Ingegneria dell'Informazione, Università di Padova, via Gradenigo 6/B, Padova 35131, Italy, Dipartimento di Ingegneria dell'Informazione, Università di Padova, via Gradenigo 6/B, Padova 35131, Italy, Dipartimento di Ingegneria dell'Informazione, Università di Padova, via Gradenigo 6/B, Padova 35131, Italy,

14:30 **Investigation on the optical stability during the ageing of InGaN-based light emitting diodes** **G.08.03**

Casu Claudia, Buffolo Matteo, Caria Alessandro, De Santi Carlo, Meneghesso Gaudenzio, Zanoni Enrico, Meneghini Matteo

University of Padova, Department of Information Engineering

14:45 **InGaN/GaN tetrahedral LED structures grown on graphene/SiC** **G.08.04**

Julien Bosch¹, Lucie Valera², Adrien Michon¹, Marc Portail¹, Jess ZÄ±iga-PÄ©rez^{1,4}, Maria Tchernycheva³, Blandine Alloing¹, Christophe Durand²

1: CRHEA-CNRS, Rue Bernard Gregory, 06560 Valbonne, France, 2: Univ. Grenoble Alpes, CEA, Grenoble-INP, IRIG, PHELIQS, NPSC, 38000 Grenoble, France, 3: Centre de Nanosciences et de Nanotechnologies (C2N), Univ. Paris-Saclay, Boulevard Thomas Gobert, 91120 Palaiseau, France, 4 : MajuLab, International Research Laboratory IRL 3654, CNRS, UniversitÄ© Äte dÄAzur, Sorbonne UniversitÄ©, National University of Singapore, Nanyang Technological University, Singapore, Singapore

15:00 **GaN HEMT geometry optimization and thermal cross-talk between devices analysis based on hybrid electrothermal simulations** **G.08.05**

Antonio Valletta, Valentina Mussi, Matteo Rapisarda, Andrea Lucibello, Marco Natali, Marco Peroni, Claudio Lanzieri, Guglielmo Fortunato, Luigi Mariucci

Antonio Valletta, Valentina Mussi, Matteo Rapisarda, Guglielmo Fortunato, and Luigi Mariucci are with IMM-CNR, 00133 Rome, Italy, Andrea Lucibello, Marco Natali, Marco Peroni, and Claudio Lanzieri are with Leonardo Company, 00131 Rome, Italy,

15:15 **Innovative Approach for Changing Electrical and Optical Properties of GaN** **G.08.06**

Bockowski M., Sierakowski, K, Jaroszynski P., Sochacki T, Fijalkowski M., Iwinska M.

Institute of High Pressure Physics Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland

15:30 **Break**

WBG miscellaneous : Filippo Giannazzo

16:00 **Low temperature-Cathodoluminescence study of ALD-ZnO and ZnO:N films annealed under N₂/O₂ atm** **G.09.01**

Sushma Mishra, Bartlomiej S. Witkowski, Rafal Jakiela, Zeinab Khosravizadeh, Wojciech Paszkowicz, Adrian Sulich, ELLbieta Guzewicz

Institute of Physics, Polish Academy of Sciences, Al. Lotników 32/46, 02-668 Warsaw, Poland

16:15 **All-inorganic metal halide microcrystals for the detection of ultra-low concentrations of ozone and hydrogen** **G.09.02**

Konstantinos Brintakis {a*}, Aikaterini Argyrou {a,b}, Athanasia Kostopoulou {a*}, Emmanuel Stratakis {a,c*}

{a} Institute of Electronic Structure and Laser, Foundation for Research and Technology "Hellas, Heraklion, 71110, Crete, Greece, {b} University of Crete, Department of Chemistry, 71003 Heraklion, Crete, Greece, {c} University of Crete, Department of Physics, 71003 Heraklion, Crete, Greece

16:30 **Light induced dipole orientation in CsPbI₃ ferroelectric materials and its origin of hysteresis** **G.09.03**

Ajoy Mandal¹, Priyanka Rani², Suman Mandal¹, Riya Sadhukhan¹, Rajdeep Banerjee¹ & Dipak Kumar Goswami^{1,2*}

1Organic Electronics Laboratory, Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur 721302, India 2School of Nanoscience and Technology, Indian Institute of Technology Kharagpur, Kharagpur 721302, India

16:45 **Effects of Structural Relaxation on Electrical Characteristics in Solution-Processed ZnSnO Thin-Film Transistors** **G.09.04**

Yu-Jin Hwang, Do-Kyung Kim, Sang-Hwa Jeon, Ziyuan Wang, and Jin-Hyuk Bae

Yu-Jin Hwang, Do-Kyung Kim, Sang-Hwa Jeon, Ziyuan Wang, and Jin-Hyuk Bae: School of Electronic and Electrical Engineering, Kyungpook National University, 80 Daehakro, Bukgu, Daegu 41566, Republic of Korea Jin-Hyuk Bae: School of Electronics Engineering, Kyungpook National University, 80 Daehakro, Bukgu, Daegu 41566, Republic of Korea

17:00 **New Transparent and Optically Active Yttrium Aluminum Garnet and Silica Glass System** **G.09.05**

dr. Monika Skruodiene, Madara Leimane, dr. Linards Skuja, dr. Anatolijs Sarakovskis

Institute of Solid State Physics, University of Latvia,

17:15 **Low Resistance Au-free Ohmic Contact Formation to p-type GaN using Ni/Al-doped ZnO bilayer** **G.09.06**

Taoufik Slimani Tlemcani¹, Clément Mauduit^{1,2}, Micka Bah¹, Matthew Charles³, Romain Gwoziecki³, Arnaud Yvon² and Daniel Alquier¹

¹ GREMAN UMR 7347, Université de Tours, CNRS, INSA Centre Val de Loire, 37071 Tours, France ² STMicroelectronics Tours, 37071 Tours, France ³ Univ. Grenoble Alpes, CEA, LETI, 38000 Grenoble, France

Poster 2 : Marilena Vivona

17:30 **Nanostructures of WO₃@H₂Ti₃O₇ with a core-shell heterojunction formed by ion beam irradiation for H₂ gas detection** **G.P2.1**

Manoj K. Rajbhar, Dr. Shyamal Chatterjee

School of Basic Sciences, Indian Institute of Technology Bhubaneswar, Jatni, 752050, India

- 17:30 **Diamond/GaN HEMTs: an historical overview** **G.P2.2**
Joana Catarina Mendes, Michael Liehr
- Joana Catarina Mendes: Instituto de Telecomunicações e Departamento de Electrónica, Telecomunicações e Informática, Universidade de Aveiro, Portugal, Michael Liehr: W&L Coating Systems GmbH, Reichelsheim, Germany
- 17:30 **Fabrication and study of lithium doped few-layer MoS₂ films** **G.P2.3**
- Jana Hrdá^{1,2}, Tatiana Vojteková¹, Lenka Pribusová¹, Sluňáková¹, Edmund Dobrořka¹, Karol Vegso³, Igor Pál⁴, Martin Hulman¹, Marián Precner¹, Marianna Lpánková¹, Ľ tefan Chromák¹ and Michaela Sojková¹
- ¹ Institute of Electrical Engineering, Slovak Academy of Sciences, Džbravská cesta 9, 841 04 Bratislava, Slovakia, ² Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Ilkovičova 3, 812 09 Bratislava, Slovakia, ³ Institute of Physics, Slovak Academy of Sciences, Džbravská cesta 9, 845 11 Bratislava, Slovakia, ⁴ IOM-CNR, Laboratorio TASC, S.S. 14 km 163.5, 34149 Basovizza, Trieste Italy
- 17:30 **Water soluble Mercury metal-ion detection by OFET using Pyridine-end oligo p-Phenylenevinylenes as a sensing material** **G.P2.4**
- Shiv Prakash Verma, Prof. Suman Kalyan Samanta, Prof. Dipak Kumar Goswami
- School of Nanoscience & Technology IIT Kharagpur, Department of Chemistry IIT Kharagpur, Department of Physics IIT Kharagpur
- 17:30 **Interlayer charge transfer induced high spin-polarization in hBN/TMDC/PbI₂ heterostructures** **G.P2.5**
- Prahalad Kanti Barman, Saroj Poudyal, Wahidur Rahman, Renu Yadab, Bubunu Biswal, Abhishek Misra
- 1) Department of Physics, Indian Institute of Technology Madras, Chennai-600 036, India, 2) 2D Materials Research and Innovation Group, Indian Institute of Technology Madras, Chennai-600 036, India

17:30 **Sputter deposition of $\text{Zn}_x\text{Mg}_{1-x}\text{O}:\text{Al}$ conducting thin films with controllable band-gap and transparency** **G.P2.6**

Aleksandra Wójcicka, Zsolt Fogarassy, Adám Rácz, Erzsébet Dodony, Tatyana Kravchuk, Michał A. Borysiewicz

AW, MAB - Łukasiewicz Research Network "Institute of Microelectronics and Photonics, Warsaw, Poland, ZF, AR, ED - Institute for Technical Physics and Materials Science, Centre for Energy Research, Budapest, Hungary, TK - Technion - Israel Institute of Technology, Haifa, Israel

17:30 **Effect of oxygen partial pressure on the properties of sputtered vertical $\text{NiO}/\text{In}_2\text{O}_3$ -Ga $_{203}$ heterojunction diodes** **G.P2.7**

Andrzej Taube, Michał Borysiewicz, Oskar Sadowski, Aleksandra Wójcicka, Jarosław Tarenko, Marek Wzorek, Marcin Klepka, Anna Wolska

AT, MB, AWójcicka, MW - Łukasiewicz Research Network "Institute of Microelectronics and Photonics, OS, JT - Łukasiewicz Research Network "Institute of Microelectronics and Photonics, Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, MK, AWolska - Institute of Physics, Polish Academy of Sciences

17:30 **Development of all-oxide transparent vertical ITO and AZO In_2O_3 -Ga $_{203}$ Schottky diodes** **G.P2.8**

Andrzej Taube, Michał Borysiewicz, Oskar Sadowski, Aleksandra Wójcicka, Jarosław Tarenko, Marek Wzorek

AT, MB, AW, MW - Łukasiewicz Research Network "Institute of Microelectronics and Photonics, OS, JT - Łukasiewicz Research Network "Institute of Microelectronics and Photonics, Warsaw University of Technology, Institute of Microelectronics and Optoelectronics

17:30 **Near-Infrared Powder Electroluminescence from Cr^{3+} -doped Ga $_{203}$ Phosphor** **G.P2.9**

Jingi Gim, Sanghyeon Lim, Gyeongdo Baek, Hyunjee Jung, Mohammad M. Afandi, Jehong Park, Jongsu Kim

Department of Display Science and Engineering, Pukyong National University

17:30 **Low-Power Photodetector based on a High-Photoresponse, Plasmonic-Effect-Induced Gateless Quasi-Freestanding Graphene Device** **G.P2.10**

IB Khadka¹, NR Alluri^{2,3}, MM Alsardia¹, NPM Joseph Raj², APS Prasanna², BU Haq⁴, SJ Kim², Se-Hun Kim^{1*}

¹Faculty of Science Education, Jeju National University, Jeju, Korea, ²Faculty of Applied Energy System, Jeju National University, Jeju, Korea, ³Material Research and Technology Department, Luxembourg Institute of Science and Technology, Belvaux, Luxembourg, ⁴Department of Physics, King Khalid University, Abha, Saudi Arabia

17:30 **Enhancing the sensitivity of sulfur mustard gas stimulant via incorporating the MOF molecules into organic semiconductor.** **G.P2.11**

Samik Mallik ¹, Shiv Prakash Verma ¹, Shyam Chand Pal ⁴, Ajoy Mandal ², Riya Sadhukhan ², Suman Mandal ², Prasanta Kumar Guha ^{1,3}, Madhab Chandra Das ⁴, Dipak Kumar Goswami ^{1,2}.

¹. School of Nanoscience and Technology, Indian Institute of Technology Kharagpur, Kharagpur – 721302, India, ². Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur – 721302, India, ³. Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology Kharagpur, Kharagpur – 721302, India, ⁴. Department of Chemistry, Indian Institute of Technology Kharagpur, Kharagpur – 721302, India

17:30 **Synthesis of Molecularly Encapsulated Benzodithiophene Conjugated Polymers** **G.P2.12**

Darcy Unson, Dr. Anastasia Leventis, Dr. Alexander Gillett, Dr. Akshay Rao, Prof. Neil Greenham, Prof. Hugo Bronstein
Yusuf Hamied Department of Chemistry, University of Cambridge, Cavendish Laboratory, University of Cambridge

17:30 **Layered GaSe_{1-x}S_x crystals: properties and perspectives** **G.P2.13**

Yerzhan Mukhametkarimov, Madi Aitzhanov, Renata Nemkayeva, Nazim Guseinov

- National Nanotechnological Laboratory Open Type at Al-Farabi Kazakh National University, al-Farabi, 71, Almaty 050040, Kazakhstan
- 17:30 **Emergence of half-metallic ferromagnetism in transition metal substituted NBT** **G.P2.14**
Chandan Kumar Vishwakarma* and B. K. Mani
Department of Physics, Indian Institute of Technology, Hauz Khas, New Delhi 110016, India
- 17:30 **Effect of sputtering power on the electrical properties of Al-doped ZnO thin films** **G.P2.15**
K. Kacha¹, F. Djeflal¹, A. Bendjerad¹, H. Ferhati^{1,2}, A. Benhaya¹ and A. Saidi³

1 LEA, Department of Electronics, University of Batna 2, Batna 05000, Algeria 2 ISTA, University of Larbi Ben Mâ€™ehidi, Oum El Bouaghi, Algeria 3 Research Scientific and Technical Center on Physico-Chemical Analysis (CRAPC), Tipaza, Algeria.
- 17:30 **Performance analysis of SnS solar cells using SnO₂ electron transport layer: numerical simulation and DFT calculations** **G.P2.16**
F. Djeflal¹, H. Ferhati^{1,2}, A. Benyahia¹ and Z. Dibi³

1 LEA, Department of Electronics, University of Batna 2, Batna 05000, Algeria 2 ISTA, University of Larbi Ben Mâ€™ehidi, Oum El Bouaghi, Algeria 3 University of Larbi Ben Mâ€™ehidi, Oum El Bouaghi, Algeria
- 17:30 **Solar-blind ultraviolet detection using a Zn₂SiO₄/LiNbO₃-based surface acoustic wave oscillator** **G.P2.17**
Sanghyeon Lim, Jingi Gim, Gyeongdo Baek, Hyunjee Jung, Mohammad M. Afandi, Jehong Park, Jongsu Kim
Department of Display Science and Engineering, Pukyong National University, Busan 48513, South Korea
- 17:30 **Effect of Mn doping and pressing pressure on optical, electrical and structural properties of ZnO and (Mg,Zn)O ceramics** **G.P2.18**
I.Markevich, N.Korsunska, N.Stara, I.Vorona, S. Ponomaryov, O. Kozoriz, Yu. Polishchuk, L. Melnichuk, O.Melnichuk, L.Khomenkova

1)V. Lashkaryov Institute of Semiconductor Physics, 45 Pr.Nauky, 03028 Kyiv, Ukraine, 2) Nizhyn Gogol State University, 2 Graftska str., 16600 Nizhyn, Ukraine, 3) National University of Kyiv-Mohyla Academy, 2 Skovorody str., 04070 Kyiv, Ukraine

WEDNESDAY, 21 SEPTEMBER 2022

Diamond and AlN: Joint Session Symposia F and G : Ekaterine Chikoidze and Patrick Fiorenza

14:00 **Diamond: from material growth to power devices** **G.F&G.1**
David Eon

Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble, France

14:30 **Adsorption of aluminum and nitrogen at polar AlN surfaces – an ab initio picture of AlN growth** **G.F&G.2**

Stanislaw Krukowski, Paweł Strak, Paweł Kempisty, Konrad Sakowski

Institute of High Pressure Physics PAS, Sokolowska 29/37, 01-142 Warsaw, Poland

15:00 **Polycrystalline diamond thin films for in vitro electrophysiological sensing devices** **G.F&G.3**

Henrique L. Gomes a), Milan C. Maradiya b), Rute Félix c), Deborah M. Power c), Nádia E. Santos d), Filipe J. Oliveira e), Michael Liehr b), Susana S. Braga and Joana C. Mendes f)

a) Instituto de Telecomunicações, Departamento de Engenharia Electrotécnica e de Computadores, Universidade de Coimbra, 3030-290 Coimbra, Portugal b) W&L Coating Systems GmbH, Bingenheimer Str. 32, D-61203 Reichelsheim, Germany c) Centro de Ciências do Mar, Universidade do Algarve, 8005-139 Faro, Portugal d) LAQV-REQUIMTE, Department of Chemistry, University of Aveiro, 3810-193 Aveiro, Portugal e) CICECO, Department of Materials and Ceramic Engineering, University of Aveiro, 3810-193 Aveiro f) Instituto de Telecomunicações e Departamento de Electrónica, Telecomunicações e Informática, Universidade de Aveiro, 3810-193 Aveiro, Portugal

15:15 **Development of thin GaN channel high electron mobility transistors on AlN bulk substrate** **G.F&G.4**

Reda Elwaradi, Catherine Bougerol, Jash Mehta, Maud Nemoz, Farid Medjdoub, Yvon Cordier

Exagan SAS, 190 chemin des fontaines, 38190 Bernin, France, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France, IEMN, CNRS, University of Lille, 59650 Villeneuve d'Ascq, France, Universit   C  te d  Azur, CNRS, CRHEA, rue B. Gr  gory, 06560 Valbonne, France, IEMN, CNRS, University of Lille, 59650 Villeneuve d'Ascq, France, Universit   C  te d  Azur, CNRS, CRHEA, rue B. Gr  gory, 06560 Valbonne, France

16:00 **Disorder-induced ordering in Ga₂O₃ polymorphs**

G.F&G.5

A. Azarov, C. Bazioti, V. Venkatachalapathy, P. Vajeeston, E. Monakhov, A. Kuznetsov

University of Oslo, Centre for Materials Science and Nanotechnology, POB1048 Blindern, 0316 Oslo, Norway

Gallium Oxide: Joint Session Symposia F and G : Ekaterine Chikoidze and Patrick Fiorenza

16:30 **Deep electron traps in   -Ga₂O₃ crystal grown by floating zone**

G.F&G.6

Coralie Perrier, Yosra Mzali, Aboulaye Traor  , Toshimitsu Ito, Hitoshi Umezawa, Etienne Gheeraert and Philippe Ferrandis

Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France, Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8571, Japan, Electronics and Photonics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki 305-8565, Japan, Advanced Power Electronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Osaka 563-8577, Japan, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut N  el, 38000 Grenoble, France,

16:45 **Nanoindentation analysis of Ga₂O₃ thin membranes produced by ion implantation and irradiated with Argon**

G.F&G.7

M. Peres[1,2,3], I. Bdikin[4], J.C. Mendes[5],*, D. M. Esteves[1,3], D. R. Pereira[1,3], L. C. Alves[1,6], E. Alves[1,2], L. F. Santos[7], K. Lorenz[1,2,3]
 [1] DECN, Instituto Superior Técnico, University of Lisbon, Bobadela 2695-066, Portugal, [2] IPFN, Instituto Superior Técnico, University of Lisbon, Lisbon 1049-001, Portugal [3] INESC MN, Lisbon 1000-029, Portugal, [4] Department of Mechanical Engineering, University of Aveiro, Aveiro 3810-193, Portugal, [5] Instituto de Telecomunicações e Departamento de Electrónica, Telecomunicações e Informática, Universidade de Aveiro, Portugal, [6] C2TN, Instituto Superior Técnico, University of Lisbon, Bobadela 2695-066, Portugal, [7] CQE, Institute of Molecular Sciences and Dept. of Chemical Engineering, Instituto Superior Técnico, University of Lisbon, Lisbon 1049-001, Portugal,

THURSDAY, 22 SEPTEMBER 2022

III- Nitride heterostructures technology : Malgorzata Iwinska

9:00 Growth of AlScN/GaN heterostructures by metal-organic chemical vapor deposition: challenges and perspectives G.13.01

S. Leone, I. Streicher, C. Manz, L. Kirste, M. Prescher, H. Menner, P. Waltereit, M. Mikulla, R. Quay, O. Ambacher
 Fraunhofer IAF, Fraunhofer Institute for Applied Solid State Physics, Freiburg, Germany

9:30 E/D-mode GaN HEMT co-integration using selective sublimation and local area regrowth G.13.02

Thi Huong Ngo¹, Rami Comyn¹, Sébastien Chenot¹, Julien Brault¹, Maud Nemoz¹, Philippe Vennings¹, Benjamin Damilano¹, Stéphane Vézian¹, Eric Frayssinet¹, Flavien Cozette², Nicolas Defrance³, François Lecourt⁴, Nathalie Labat⁵, Hassan Maher², Yvon Cordier¹
¹Université Côte d'Azur, CNRS, CRHEA, rue Bernard Grégory, 06905, Sophia Antipolis, France ²Laboratoire Nanotechnologies Nanosystèmes, CNRS-UMI-3463, 3IT, Université de Sherbrooke, 3000 Bd de l'Université, Sherbrooke, J1K0A5, QC, Canada ³CNRS-IEMN à l'Université de Lille, UMR8520, Av. Poincaré, 59650 Villeneuve d'Ascq, France ⁴OMMIC, 2 rue du Moulin, 94450 Limeil-Brévannes, France ⁵Laboratoire de l'Intégration du Matériau au Système, Université de Bordeaux, Talence, France

9:45 ScxAl1-xN/GaN high electron mobility transistor heterostructures grown by ammonia source molecular beam epitaxy G.13.03

Caroline Elias
Maxime Hugues , Yvon Cordier

10:00 **Study of Magnesium activation effect on pinch-off voltage of normally-off p-GaN HEMTs for power applications** **G.13.04**

Giovanni Giorgino, Giuseppe Greco, Maurizio Moschetti, Cristina Miccoli, Maria Eloisa Castagna, Cristina Tringali, Aurore Constant, Patrick Fiorenza, Fabrizio Roccaforte, Ferdinando Iucolano

STMicroelectronics, CNR-IMM, STMicroelectronics, STMicroelectronics,
STMicroelectronics, STMicroelectronics, STMicroelectronics, CNR-IMM, CNR-IMM,
STMicroelectronics

10:15 **Revealing conduction channels in wide bandgap semiconductors: III-nitrides and metal oxides case studies** **G.13.05**

Sebastian ZŁotnik 1, Karolina Moszak 2, Damian Pucicki 2,3, Karolina PiÄ™tak 4, Alessandro Pianelli 1,5, Aleksandra Seweryn 6, Marek Godlewski 6, Jacek Boguski 1, Marek A. Kojdecki 7, Jerzy WrÅłbel 1,6, JarosŁaw WrÅłbel 1
1 Institute of Applied Physics, Military University of Technology, 2 Kaliskiego Str., 00-908 Warsaw, Poland, 2 ŁŁukasiewicz Research Network "PORT Polish Center for Technology Development, StabŁowicka 147, 54-066 WrocŁaw, Poland, 3 Department of Nanometrology, Faculty of Electronics, Photonics and Microsystem, WrocŁaw University of Science and Technology, Janiszewskiego 11/17, 50-372 WrocŁaw, Poland, 4 ŁŁukasiewicz Research Network "Institute of Microelectronics and Photonics, Al. LotnikÅłw 32/46, 02-668 Warsaw, Poland, 5 Faculty of Engineering and Natural Science, Tampere University, Tampere 33720, Finland, 6 Institute of Physics, Polish Academy of Sciences, Aleja LotnikÅłw 32/46, 02-668 Warsaw, Poland, 7 Institute of Mathematics and Cryptology, Military University of Technology, 2 Kaliskiego Str., 00-908 Warsaw, Poland

10:30 **Break**

III-Nitrides insulated transistors and defects : Fabrizio Roccaforte

11:00 **Development of Atomic Layer Deposited Al₂O₃ on n-GaN for Gate Insulator in Vertical finFETs** **G.14.01**

Liad Tadmor¹, Enrico Brusaterra¹, Eldad Bahat Treidel¹, Paul Plate², Oliver Hilt¹ and Joachim WÄŁrfl¹

1. Ferdinand-Braun-Institute (FBH), Gustav-Kirchhoff-Strasse 4 12489 Berlin, Germany. 2. Plasma Process Technology Department, SENTECH Instruments GmbH, 12489 Berlin, Germany

11:15 Fabrication of quasi-vertical GaN FinFETs on SiC substrates G.14.02

Philipp Gribisch(1,2), Rosalia Delgado Carrascon(4,5), Vanya Darakchieva (2,3,4,5), Erik Lind(1,2)

1Department of Electrical and Information Technology, Lund University, Box 118, 22 100 Lund, Sweden 2NanoLund, Lund University, Box 118, 22 100 Lund, Sweden 3Department of Physics, Lund University, Box 118, 22100 Lund, Sweden 4Department of Physics, Chemistry and Biology, Linköping University, 581 83 Linköping, Sweden 5Center for III-Nitride Technology, C3NIT-JanzÅn, Linköping University, 581 83 Linköping, Sweden

11:30 Early growth stages of Al₂O₃ by Thermal and Plasma-Enhanced Atomic Layer Deposition on AlGa_N/GaN heterostructure G.14.03

E. SchilirÅ, 1, P. Fiorenza1, G. Greco1, F. Monforte2, G.G. Condorelli2, F. Roccaforte1, F. Giannazzo1, R. Lo Nigro1

(1) CNR-IMM, Strada VIII, 5 95121, Catania, Italy, (2) Department of Chemistry, University of Catania, Viale Andrea Doria n 5, 95125, Catania, Italy,

11:45 Strategies for interface modification of n-type N-face GaN and p-type Ga-face GaN to obtain transparent ohmic contacts using AZO G.14.04

Aleksandra WÅjcicka, Zsolt Fogarassy, Tatyana Kravchuk, Cecile Saguy, Eliana KamiÅska, Piotr Perlin, Szymon Grzanka, MichaÅ A.Å Borysiewicz

AW, MAB - Łukasiewicz Research Network Å Inst. of Microelectronics and Photonics, Warsaw, Poland, ZF - Institute for Technical Physics and Materials Science, Centre for Energy Research, Budapest, Hungary, TK, CS - Technion - Israel Institute of Technology, Haifa, Israel, EK, PP - Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland, SG - TOP-GAN, Warsaw, Poland

12:00 **Formation and electronic properties of deep-level traps in homo-epitaxial n-GaN layers grown by MOVPE** **G.14.05**

P. Kruszewski¹, J. Plesiewicz¹, P. Prystawko¹, S. Bulka², Z. Zimek², M.P. Halsall³, A.R. Peaker³, V.P. Markevich³

¹ Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland ² Institute of Nuclear Chemistry and Technology, Dorodna 16, 03-195 Warsaw, Poland ³ Photon Science Institute and Department of Electrical and Electronic Engineering, The University of Manchester, Manchester M13 9PL, United Kingdom

12:15 **Aluminum Frenkel defects as bistable traps in Al₂O₃/AlGaN junctions** **G.14.06**

I. Deretzis, P. Fiorenza, T. Fazio, E. Schilir , R. Lo Nigro, G. Greco, G. Fisicaro, F. Roccaforte, A. La Magna
Institute for Microelectronics and Microsystems (CNR-IMM), VIII strada 5, 95121 Catania, Italy

12:30 **Lunch**

Bulk GaN for vertical devices : Stefano Leone

14:00 **Recent progress in crystallization of bulk gallium nitride: wafers for vertical power devices** **G.15.01**

Malgorzata Iwinska, Robert Kucharski, Karolina Grabianska, Tomasz Sochacki, Boleslaw Lucznik, and Michal Bockowski
Institute of High Pressure Physics, Polish Academy of Sciences, Sok owska 29/37 Warsaw, 01-142 Poland

14:30 **Ni Schottky contacts on GaN epilayers grown on bulk substrates** **G.15.02**

Fabrizio Roccaforte ¹, Giuseppe Greco ¹, Filippo Giannazzo ¹, Patrick Fiorenza ¹, Emanuela Schilir  ¹, Salvatore Di Franco ¹, Pierre-Marie Coulon ², Eric Frayssinet ², Yvon Cordier ²

¹ Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica e Microsistemi (CNR-IMM), Catania, Italy, ² Universit  C te d'Azur, CNRS, CRHEA, Valbonne, France

14:45 **Drift Region Epitaxial Development and Characterization in Vertical GaN Based Devices** **G.15.03**

Eldad Bahat Treidel, Frank Brunner, Enrico Brusaterra, Mihaela Wolf, Liad Tadmor, Oliver Hilt and Joachim WÄrfl
 Ferdinand-Braun-Institute (FBH), Gustav-Kirchhoff-Strasse 4 12489 Berlin, Germany.

15:00 Towards GaN-on-GaN high power vertical transistors G.15.04

P. Prystawko

Institute of High Pressure Physics PAS, ul. Sokolowska 29/37,01-142, Warsaw, Poland

15:15 Influence of Fluorine implantation on the electrical characteristics of GaN-on-GaN vertical Schottky and P-N diodes G.15.05

Vishwajeet Maurya*,1,2 , Julien Buckley 1, Daniel Alquier 2 , Helge Haas 1 , Mohamed-Reda Irekti 1 , Matthew Charles 1 , Thomas Kaltsounis 1, Camille Sonnevill 3 , Veronique Sousa 1

1. CEA, LETI, MINATEC Campus, F-38054 Grenoble, France 2. GREMAN (UMR 7347), UniversitÄ© de Tours, France 3. Univ. Lyon, INSA Lyon, Univ. Claude Bernard Lyon 1, Ecole Centrale Lyon, CNRS, AmpÄre, 69621, Villeurbanne, France France

15:30 Break

GaN on Sapphire and on Silicon : Bela Pecz

16:00 Optimization of GaN-on-Sapphire Edge Termination Technology for High Power GaN Vertical Devices G.16.01

Enrico Brusaterra *, Eldad Bahat Treidel, Mihaela Wolf, Liad Tadmor, Andreas Thies, Ralph Stephan Unger, Oliver Hilt and Joachim WÄrfl *Corresponding author: Enrico.Brusaterra@FBH-berlin.de

Ferdinand-Braun-Institut (FBH) gGmbH, Gustav-Kirchhoff-Strasse 4, 12489 Berlin, Germany

16:15 Dislocation analysis on GaN epilayer by high temperature KOH etching for RF technology G.16.02

Ruggero Anzalone1, Jacopo Frascaroli2, Andrea Serafini2, Isabella Mica2, Andrea Severino1

1 STMicroelectronics (STM), Stradale Primosole, 50, 95121 Catania, Italy 2 STMicroelectronics (STM), Via C. Olivetti 2, 20864 Agrate Brianza (MB), Italy,

16:30 **Localised epitaxy of GaN-on-Si for the next generation of vertical power devices**

G.16.03

Thomas Kaltsounis, Helge Haas, Matthieu Lafossas, Simona Torrenco, Vishwajeet Maurya, Julien Buckley, Denis Mariolle, Van-Hoan Le, N  vine Rochat, Alain Gueugnot, Laurent Mendizabal, Matthew Charles, Yvon Cordier

Thomas Kaltsounis(CEA), Helge Haas(CEA), Matthieu Lafossas(CEA), Simona Torrenco(CEA), Vishwajeet Maurya(CEA), Julien Buckley(CEA), Denis Mariolle(CEA), Van-Hoan Le(CEA), N  vine Rochat(CEA), Alain Gueugnot(CEA), Laurent Mendizabal(CEA), Matthew Charles(CEA), Yvon Cordier(CRHEA)



Symposium H

Sessions: Room 231 | Main Building

Poster Session: Small Hall | Main Building

Nanomaterials:

Innovative and advanced epitaxy

Symposium Organizers: **Achim TRAMPERT** Paul-Drude-Institut für Festkörperelektronik Germany

Charles CORNET FOTON laboratory – INSA Rennes France

Frédéric LEROY Aix-Marseille Université France

Gavin BELL University of Warwick UK

Symposium H Program

MONDAY, 19 SEPTEMBER 2022

Welcome Session & COST presentation C. Cornet, G. Bell, F. Leroy and A.

9:00 **Trampert**

Session 1 - Growth processes: surfaces, interfaces, wetting, kinetics, thermodynamics -1 : J.-N. Aqua

9:30 **Modeling nucleation and growth statistics in semiconductor nanowires, based on in situ experiments** **H.01.01**
Frank Glas

Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, 10 boulevard Thomas Gobert, 91120 Palaiseau, France

10:00 **Growth of self-aligned dichroic plasmonic nanostructures on amorphous surfaces** **H.01.02**
D. Babonneau, E. De Los Santos Vazquez, S. Camelio, S. Rousselet, F. Pailloux, G. Abadias, M. Bayle, B. Humbert

D. Babonneau Institut Pprime, UPR 3346 CNRS-Université de Poitiers, Département Physique et Mécanique des Matériaux, 86073 Poitiers, France, E. De Los Santos Vazquez Institut Pprime, UPR 3346 CNRS-Université de Poitiers, Département Physique et Mécanique des Matériaux, 86073 Poitiers, France, and Institut des Matériaux Jean Rouxel, Université de Nantes, UMR 6502 CNRS, 44322 Nantes Cedex 3, France, S. Camelio Institut Pprime, UPR 3346 CNRS-Université de Poitiers, Département Physique et Mécanique des Matériaux, 86073 Poitiers, France, S. Rousselet Institut Pprime, UPR 3346 CNRS-Université de Poitiers, Département Physique et Mécanique des Matériaux, 86073 Poitiers, France, F. Pailloux Institut Pprime, UPR 3346 CNRS-Université de Poitiers, Département Physique et Mécanique des Matériaux, 86073 Poitiers, France, G. Abadias Institut Pprime, UPR 3346 CNRS-Université de Poitiers, Département Physique et Mécanique des Matériaux, 86073 Poitiers, France, M. Bayle Institut des Matériaux Jean Rouxel, Université de Nantes, UMR 6502 CNRS, 44322 Nantes Cedex 3, France, B. Humbert Institut des Matériaux Jean Rouxel, Université de Nantes, UMR 6502 CNRS, 44322 Nantes Cedex 3, France,

10:30 **Coffee Break**

Session 1 - Growth processes: surfaces, interfaces, wetting, kinetics, thermodynamics-2 : F. Glas

11:00 **Thermal laser epitaxy for thin film growth** **H.02.01**

Dong Yeong Kim, Thomas J. Smart, Hans Boschker, Sander Smink, Lena Majer, Jochen Mannhart, and Wolfgang Braun

Max Planck Institute for Solid State Research, Max Planck Institute for Solid State Research, Epiray, Max Planck Institute for Solid State Research, Max Planck Institute for Solid State Research, Max Planck Institute for Solid State Research, Max Planck Institute for Solid State Research

11:15 **Investigation of interdiffusion in single quantum well and multi quantum well structures of ZnO/ZnCdO thin films by MBE** **H.02.02**

M. Stachowicz¹, S. Magalhaes², E. Przezdziecka¹, J.M. Sajkowski¹, A. Pieni^{??}ek¹, E. Alves², A. Kozanecki¹

¹Institute of Physics, Polish Academy of Sciences, Al. Lotnik^{??}ów 32/46 PL-02-668 Warsaw, Poland ² Centro Tecnol^{??}gico Nuclear, Instituto Superior T^{??}cnico, Universidade de Lisboa, P-2686953 Sacav^{??}m, Portugal

11:30 **Exploring interface optimization via growth interruption stages in GaAsSb/GaAsN type-II superlattices for high efficiency solar** **H.02.03**

T. Ben¹, V. Braza¹, S. Flores¹, A. Gallego Carro², L. Stanojevi^{??}2, Malte Schwarz², D. Fernandez-Reyes¹, ?. Ga^{??}evi^{??}2, J.M. Ulloa² and D. Gonzalez¹

¹ University Research Institute on Electron Microscopy & Materials, (IMEYMAT), Universidad de C^{??}iz, 11510 Puerto Real (C^{??}iz), Spain ² Institute for Optoelectronic Systems and Microtechnology (ISOM), Universidad Polit^{??}cnica de Madrid, Avda. Complutense 30, 28040 Madrid, Spain

11:45 **Understanding the ultrafast growth mechanism of superconducting epitaxial thin films by in-situ X-ray synchrotron diffraction** **H.02.04**

Elzbieta Pach¹, Jordi Aguilar¹, Daniel Sanchez², Lavinia Saltarelli¹, Diana Garcia¹, Albert Queralt¹, Kapil Gupta¹, Eduardo Solano³, Marc Malfois³, Xavier Obradors¹, Teresa Puig¹

1 Institut de Ci  ncia de Materials de Barcelona, ICMA-B-CSIC, Campus de la UAB, 08193 Cerdanyola del Vall  s, Spain, 2 GRMT, Department of Physics, University of Girona, E17071-Girona, Spain, 3 NCD-Sweet beamline, ALBA synchrotron light source, 08290 Cerdanyola del Vall  s, Spain

12:00 **Control of growth kinetics for graphene buffered remote epitaxy of homoepitaxial SrTiO₃** **H.02.05**

M. A. Wohlgemuth, U. Trstenjak, A. Sarantopoulos, F. Gunkel, R. Dittmann

Peter-Gr  nberg-Institut 7, Forschungszentrum J  lich GmbH, JARA-FIT, RWTH Aachen

12:15 **SrIrO₃ thin films for spintronic applications: role of growth kinetics** **H.02.06**

V. Fuentes b, S. Martin-Rio b, Z. Konstantinovi   a, C. Frontera b, Ll. Balcells b, B. Mart  nez b, A. Pomar b

a Center for Solid State Physics and New Materials, Institute of Physics Belgrade, Serbia b Instituto de Ciencia de Materiales de Barcelona, ICMA-B-CSIC, 08193 Spain

12:30 **Lunch Break**

Session 1 - Growth processes: surfaces, interfaces, wetting, kinetics, thermodynamics-3 : P. M  ller

14:00 **Selective area growth for as-grown electronic circuits** **H.03.01**

Thomas Sand Jespersen

Department of Energy Conversion and Storage Technical University of Denmark

14:30 **GIFAD, the soft technique for characterizing surface and thin film structure, growth dynamics and phase transitions in real-time** **H.03.02**

H. Khemliche, A.R. Allouche, A. Mukherjee, A. Momeni, E. M. Staicu Casagrande
Universit   Paris-Saclay, CNRS, Institut des Sciences Mol  culaires d'Orsay, 91405, Orsay, France

14:45 **Kinetic Monte Carlo simulations of 2D materials epitaxial growth** **H.03.03**

Jean-Noel AQUA [1], Zouhour BEN JABRA [2], Mathieu ABEL [2], Isabelle BERBEZIER [2], Mathieu KOUDIA [2], Antoine RONDA [2], Filippo FABBRI [3], Adrien MICHON [4], Paola CASTRUCCI [5], Maurizio DE CRESCENZI [5], Holger VACH [6].

[1] INSP, Sorbonne Université, CNRS, Paris, France [2] IM2NP, Aix-Marseille Université, CNRS, Marseille, France [3] NEST, Istituto Nanoscienze - CNR, Pisa, Italy [4] CRHEA, Université Côte d'Azur, CNRS, Valbonne, France [5] Dipartimento di Fisica, Università di Roma Tor Vergata, Roma, Italy [6] LPICM, CNRS, Ecole Polytechnique, IP Paris, Palaiseau, France

15:15 **Coffee Break**

Session 2 - Structure, stress and defects in epitaxial materials-1 : P. MÄLler

- | | | |
|-------|---|----------------|
| 16:00 | <p>How Can the Electrocaloric Response in Ferroelectrics be Enhanced? Through Crystallographic Texture, or Point Defects, or Phase</p> <p>Ebru MENSUR ALKOY
GEBZE TECHNICAL UNIVERSITY</p> | H.04.01 |
| 16:30 | <p>Unfolding the role of defect engineering in graphene during Van der Waals epitaxy of semiconductors</p> | H.04.02 |

TadeÅ? Hanu?, Thierno Mamoudou Diallo, Andreas Ruediger, Gilles Patriarche, Pascal Brault, Abderraouf Boucherif

TadeÅ? Hanu? 1: Institut Interdisciplinaire d'Innovation Technologique (3IT) Université de Sherbrooke, 3000 Boulevard de l'Université, Sherbrooke, J1K 0A5, QC, Canada 2: Laboratoire Nanotechnologies Nanosystèmes (LN2) - CNRS IRL-3463, 3000 Boulevard de l'Université, Sherbrooke, J1K 0A5, QC, Canada ,Thierno Mamoudou Diallo 1: Institut Interdisciplinaire d'Innovation Technologique (3IT) Université de Sherbrooke, 3000 Boulevard de l'Université, Sherbrooke, J1K 0A5, QC, Canada 2: Laboratoire Nanotechnologies Nanosystèmes (LN2) - CNRS IRL-3463, 3000 Boulevard de l'Université, Sherbrooke, J1K 0A5, QC, Canada ,Andreas Ruediger 3: Nanoelectronics-Nanophotonics INRS-EMT, 1650, Boulevard Lionel-Boulet, Varennes, J3X 1S2 QC, Canada ,Gilles Patriarche 4: Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies (C2N), Palaiseau, 91120, France ,Pascal Brault 5: GREMI, Groupe de Recherches sur l'Énergie des Milieux Ionisés UMR7344, CNRS/Université d'Orléans, 14 rue d'Issoudun, BP 6744, 45067 Orléans Cedex 2, France ,Abderraouf Boucherif 1: Institut Interdisciplinaire d'Innovation Technologique (3IT) Université de Sherbrooke, 3000 Boulevard de l'Université, Sherbrooke, J1K 0A5,

QC, Canada 2: Laboratoire Nanotechnologies Nanosystèmes (LN2) - CNRS IRL-3463, 3000 Boulevard de l'Université, Sherbrooke, J1K 0A5, QC, Canada

16:45 **Epitaxial growth of detachable GaAs/Ge heterostructure on mesoporous Ge substrate for layer transfer process and substrate reuse** **H.04.03**

Nicolas Paupy, Bouraoui Ilahi, Tadeş Hanu, Valentin Daniel, Roxana Arvinte, Alex Brice Pougoué Mbeunmi, Alexandre Heintz, Thierno Mamoudou Diallo, Zakaria Oulad Elhmaidi, Richard Arş, Abderraouf Boucherif

Nicolas Paupy 1,2, Bouraoui Ilahi 1,2, Tadeş Hanu 1,2, Valentin Daniel 1,2, Roxana Arvinte 1,2, Alex Brice Pougoué Mbeunmi 1,2, Alexandre Heintz 1,2, Thierno Mamoudou Diallo 1,2, Zakaria Oulad Elhmaidi 1,2, Richard Arş 1,2, Abderraouf Boucherif 1,2 1-Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 3000 boulevard Université, Sherbrooke, J1K 0A5 Québec, Canada 2-Laboratoire Nanotechnologies Nano systèmes (LN2) ? CNRS UMI-3463 Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 3000 boulevard Université, Sherbrooke, J1K 0A5 Québec, Canada

17:00 **Electron transport properties in thin InN layers grown on InAlN** **H.04.04**

Roman Stoklas, Stanislav Hasenšpohl, Edmund Dobroka, Filip Gučmann, Jan Kuzmák

Institute of Electrical Engineering, SAS, Dášbravská cesta 9, 841 04 Bratislava, Slovakia

17:15 **Growth and characterization of MQWs of B GaN with AlGaIn barrier** **H.04.05**

Thomas O'Connell^{1,2*}, Vitaly Zubialevich¹ Stefan Schulz^{1,3} & Peter Parbrook^{1,2}

¹Tyndall National Institute, University College Cork, Cork, Ireland ²School of Engineering, University College Cork, Cork, Ireland ³Department of Physics, University College Cork, Cork, Ireland

TUESDAY, 20 SEPTEMBER 2022

Session 2 - Structure, stress and defects in epitaxial materials-2 : E. M. Alkoy

9:00 **COMBINATION OF EPITAXY AND CONDENSATION TOWARDS THE FABRICATION OF GE PHOTODIODE** **H.05.01**

M. Bouabdellaoui(a), L. Favre(a), M. Bollani(b), Olivier Gourhant(c), Fabien Deprat(c), Christophe Duluard(c), Anne-Flore Mallet(a,c), E. Assaf(a), A. Ronda(a), M. Abbarchi(a), I. Berbezier(a)

aCNRS, IM2NP, Aix-Marseille University, Faculté des Sciences de Saint-Jérôme, case 142, 13397 Marseille, France b Institute of Photonic and Nanotechnology - Consiglio Nazionale delle Ricerche (IFN-CNR), L-NESS, via Anzani 42, Como, Italy c Digital Front End Manufacturing & Technology STMicroelectronics Crolles, France

9:30 **Halide Vapor Phase Epitaxy of Cu₃N and Cu₂O**

H.05.02

(a) Matthew Zervos , (b) Andreas Othonos

(a) Nanostructured Materials and Devices Laboratory, School of Engineering, University of Cyprus, PO Box 20537, Nicosia, 1678, Cyprus. (b) Laboratory of Ultrafast Science, Department of Physics, University of Cyprus, PO Box 20537, Nicosia, 1678, Cyprus.

9:45 **Modelling the structural origin of defects in the 2H- Ge: the extended I3 vs a point-like defect**

H.05.03

E. Scalise^{1}, F. Glas^{3}, M.A. Verheijen^{4,5}, E.P.A.M. Bakkers^{4}, A. Marzegalli^{1,2}, L. Miglio^{1}

1-L-NESS and Department of Material Science, Università degli Studi di Milano-Bicocca, via R. Cozzi 55, I-20125 Milano, Italy, 2-Department of Physics, Politecnico di Milano, via Anzani 42, I-22100 Como, Italy, 3-Centre de Nanosciences et de Nanotechnologies / Centre for Nanoscience and Nanotechnology (C2N) CNRS, Université Paris-Saclay, 10 boulevard Thomas Gobert, 91120 Palaiseau, France, 4-Department of Applied Physics, Eindhoven University of Technology, 5600 MB Eindhoven, The Netherlands, 5-Eurofins Materials Science Netherlands BV, 5656 AE Eindhoven, The Netherlands

10:00 **TEM atomic characterization of the defects behind fast ionic transport pathways in thin layers**

H.05.04

Yedra, L., Blanco-Portals, J. , López-Conesa, L., Martín, G., Ruiz-Caridad, A., Baiutti, F.4, Chiabrera, F., Diercks, D., Cavallaro, A., Garbayo, I., Walls, M., Lippert, T., Pergolesi, D., Niania, M., Ruiz-González, L., Kordatos, A., Nájuez, M., Morata, A., Chroneos, A., Aguadero, A., Kilner, J., Tarancón, A., Estrada, S., Peiró, F.

Yedra, L.1,2, Blanco-Portals, J. 1,2, Lpez-Conesa, L. 1,2,3, Martn, G. 1,2, Ruiz-Caridad, A. 1,2, Baiutti, F.4,5, Chiabrera, F.4,6, Diercks, D. 7, Cavallaro, A.8, Garbayo, I.4, Walls, M.9, Lippert, T. 10, Pergolesi, D. 10, Niania, M.8, Ruiz-Gonzlez, L.11, Kordatos, A.12, Nsez, M.4, Morata, A. 4, Chronos, A.8,12, Aguadero, A.8, Kilner, J.8, Tarancn, A.4,13, Estrad, S. 1,2, Peir, F. 1,2 1 Univ Barcelona, Lab Electron Nanoscopies LENS, Micronanotechnol & Nanoscopies Electrophoton Devi, Dept Elect & Biomed Engr, C Mart & Franques 1, Barcelona 08028, Spain 2 Univ Barcelona, Inst Nanosci & Nanotechnol IN2UB, C Mart & Franques 1, Barcelona 08028, Spain 3 Univ Barcelona CCiTUB, TEM MAT Unit, Sci & Technol Ctr, C Llus Sol & Sabars 1, Barcelona 08028, Spain 4 Catalonia Inst Energy Res IREC, Dept Adv Mat Energy, St Adri De Besos 08930, Barcelona, Spain 5 Natl Inst Chem, Dept Mat Chem, Hajdrihova 19, SI-1000 Ljubljana, Slovenia 6 Tech Univ Denmark, Dept Energy Convers & Storage, Funct Oxides Grp, Fysikvej 310, DK-232800 Lyngby, Denmark 7 Colorado Sch Mines, Dept Met & Mat Engr, Golden, CO 80401 USA 8 Imperial Coll London, Dept Mat, Prince Consort Rd, London SW7 2BP, England 9 Univ Paris Saclay, Univ Paris Sud, CNRS, Lab Phys Solides, Bldg 510, F-91405 Orsay, France 10 Paul Scherrer Institute, Forschungsstrasse 111 5232 Villigen, Switzerland 11 Univ Complutense Madrid, Dept Quim Inorgan, Fac CC Quim, E-28040 Madrid, Spain 12 Coventry Univ, Fac Engr Environm & Comp, Priory St, Coventry CV1 5FB, W Midlands, England 13 ICREA, Passeig Llus Co 23, Barcelona 08010, Spain

10:15 **Tantalum arsenide Weyl semimetal grown by molecular beam epitaxy**

H.05.05

Janusz Sadowski, Jarosaw Z. Domagaa, Wiktoria Zajkowska, Sawomir Kret, Bartomiej Seredynski, Marta Gryglas-Borysiewicz, Zuzanna Ogorzalek, Rafa, Boek, Wojciech Pacuski

Janusz Sadowski, Institute of Physics Polish Academy of Sciences, Warsaw, Poland
 Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Poland,
 Department of Physics and Electrical Engineering, Linnaeus University, Kalmar, Sweden,
 Jarosaw Z. Domagaa, Institute of Physics Polish Academy of Sciences, Warsaw, Poland,
 Wiktoria Zajkowska, Institute of Physics Polish Academy of Sciences, Warsaw, Poland,
 Sawomir Kret, Institute of Physics Polish Academy of Sciences, Warsaw, Poland,
 Bartomiej Seredynski, Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Poland,
 Marta Gryglas-Borysiewicz, Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Poland,
 Zuzanna Ogorzalek, Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Poland,
 Rafa, Boek, Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Poland,
 Wojciech Pacuski, Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Poland

10:30 **Coffee Break**

Session 3 - Epitaxy of low-dimensional materials: substrate/epilayer interactions, nanostructures-1 : F. Cheynis

11:00 **Van der Waals epitaxy of two-dimensional transition metal dichalcogenides** **H.06.01**

F. Bonelli¹, C. Vergnaud¹, A. Marty¹, H. Boukari², I. de Moraes¹, Q. Guillet¹, K. Abdukayumov¹, M. Ribeiro¹, J. Courtin¹, M. Husein¹, D. Dosenovic³, H. Okuno³, M. Jamet¹

¹: Université Grenoble Alpes, CEA, CNRS, IRIG-Spintec, 17 avenue des Martyrs, 38054 Grenoble, France ²: Institut Néel, Université Grenoble Alpes, CNRS, 25 avenue des Martyrs, 38042 Grenoble, France ³: Université Grenoble Alpes, CEA, IRIG-MEM, 17 avenue des Martyrs, 38054 Grenoble, France

11:30 **Ferroelectric phases in epitaxial ZrO₂ thin films achieved by substrate orientation control** **H.06.02**

Veniero Lenzi (1,2), José P. B. Silva (1,2), Luís Marques (1,2)

¹: Physics center of Minho and Porto Universities, Campus de Gualtar, 4710-057 Braga, Portugal. ²: Laboratory of Physics for Materials and Emergent Technologies, LapMET, University of Minho, 4710-057 Braga, Portugal.

11:45 **The first quasi-two-dimensional Mo-S-I crystals** **H.06.03**

Maja Remškar, Janez Jelenc, Srećko D. Ćipin and Zvonko Jagličić

Jozef Stefan Institute, Solid State Physics Department, Jamova 39, 1000 Ljubljana, Slovenia Institute for Physics, Mathematics and Mechanics, Jamova 39, 1000 Ljubljana, Slovenia

12:00 **Carrier separation in type II quantum dots inserted in (Zn,Mg)Te/ZnSe nanowire** **H.06.04**

P. Baranowski, M. Szymura, R. Georgiev, S. Chusnutdinov, G. Karczewski, T. Wojtowicz, P. Wojnar

P. Baranowski- Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland, M. Szymura- Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland R. Georgiev- Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland S. Chusnutdinov- Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland G. Karczewski- Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland, T. Wojtowicz - International Research Centre MagTop, Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland, P. Wojnar - Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland,

12:15 **Magneto-optical properties of a CdTe Quantum Dot with a single ion of Vanadium** **H.06.05**

K. E. Polczynska, T. Kazimierczuk, P. Kossacki and W. Pacuski

Faculty of Physics, University of Warsaw, Pasteura 5, Warsaw, Poland

12:30 **Lunch Break**

Session 3 - Epitaxy of low-dimensional materials: substrate/epilayer interactions, nanostructures-2 : M. Jamet

14:00 **Epitaxial growth of ferromagnetic van der Waals heterostructures** **H.07.01**

Joao Marcelo J. Lopes

Paul-Drude-Institut für Festkörperelektronik, Leibniz-Institut im Forschungsverbund Berlin e.V., Germany

14:30 **Selective area growth of III-As nanowire arrays by hydride vapour phase epitaxy** **H.07.02**

Emmanuel CHEREAU (1,2), Gabin GREGOIRE (1), Geoffrey AVIT (1), Catherine BOUGEROL (3,4), Alain MOREAC (5), Jean-Pierre LANDESMAN (6), Philip SHIELDS (7), Agnès TRASSOUDAIN (1), Evelyne. GIL (1), Ray.R. LAPIERRE (2), Yamina ANDRE (1)

(1) Université Clermont Auvergne, Clermont Auvergne INP, CNRS, Institut Pascal, F-63000 Clermont-Ferrand, France, (2) Department of Engineering Physics, McMaster University, Hamilton, Ontario, Canada, L8S4L7, (3) Univ. Grenoble Alpes, F-38000 Grenoble, France, (4) CNRS, Institut Néel, F-38042 Grenoble, France, (5) Univ Rennes, CNRS, IPR-UMR 6251, F-35000 Rennes, France, (6) Univ Rennes, INSA Rennes, CNRS, Institut FOTON-UMR 6082, F-35000 Rennes, France, (7) Department of Electronic & Electrical Engineering, University of Bath, Claverton Down, Bath BA2 7AY, UK

14:45 **Strain and quantum confinement effects in ultra-thin (Cd,Mn)Te/(Cd,Mg)Te core/shell nanowires** **H.07.03**

P. Wojnar 1, J. Plachta 1, T. Kazimierczuk 2, P. Kossacki 2, G.Karczewski 1, T. Wojtowicz 3

1 Institute of Physics, Polish Academy of Sciences, Aleja Lotników 32/46, PL-02-668 Warsaw, Poland 2 Institute of Experimental Physics, Faculty of Physics, University of Warsaw, ul. Pasteura 5, PL-02-093 Warsaw, Poland 3 International Research Centre MagTop, Aleja Lotników 32/46, PL-02-668 Warsaw, Poland

15:00 Formation of Bismuth Quantum Dots via Segregation H.07.04

Arnas Pukinskas¹, Nerijus Jurkšnas², Silvija Keraitytė^{1,3}, Algirdas Jasinskas¹, Andrea Zelioli¹, Simona Plakienė¹, Bronislovas Šechavičius¹, Arnas Naujokaitis¹, Martynas Skapas¹, Monika Jokubauskaitė^{1,3}, Evelina Dudutienė¹, and Renata Butkutė^{1,3}
¹ Department of Optoelectronics, Centre for Physical Sciences and Technology, Saulėtekio av. 3, Vilnius, Lithuania ²Optonas Ltd., Savanorių av. 235, Vilnius, Lithuania
³Institute of Photonics and Nanotechnology, Faculty of Physics, Vilnius University, Saulėtekio av. 3, Vilnius, Lithuania

15:15 Highly uniform epitaxial GaSb quantum dots for telecom wavelength range H.07.05

Teemu Hakkarainen, Joonas Hilska, Abhiroop Chellu, Mircea Guina

Optoelectronics Research Centre, Physics Unit, Tampere University, Finland

15:30 Coffee Break

Session 3 - Epitaxy of low-dimensional materials: substrate/epilayer interactions, nanostructures-3 : J. M. Lopes

16:00 Free-standing InSb nanostructures: growth, morphology control and electrical characterization H.08.01

Valentina Zannier¹, Isha Verma¹, Sedighe Salimian¹, Stefan Heun¹, Francesca Rossi², Daniele Ercolani¹, Fabio Beltram¹ and Lucia Sorba¹

¹ NEST, Istituto Nanoscienze - CNR and Scuola Normale Superiore, Piazza San Silvestro 12, I-56127 Pisa, Italy ² IMEM-CNR, Parco Area delle Scienze 37/A, I-43124 Parma, Italy

16:30 Enhancement of the electromechanical conversion properties of GaN NWs thanks to the Surface charges effects H.08.02

T. Sodhi¹⁻², P. Chretien², L. Couraud¹, L. Travers¹, J.C. Harmand¹, F. H. Julien¹, M. Tchernycheva¹, F. Houzé², N. Gogneau¹

¹Centre de Nanosciences et Nanotechnologies, Université Paris-Saclay, CNRS, UMR9001, Palaiseau, France, ²Laboratoire de Génie Électrique et Électronique de Paris, Université Paris-Saclay, CentraleSupélec, Sorbonne Université, CNRS, Gif sur Yvette, France

16:45 Two-Stage Epitaxy of Boron Nitride – the Influence of the Initial Conditions H.08.03

Aleksandra K. Dąbrowska, Mateusz Tokarczyk, Grzegorz Kowalski, Johannes Binder, Rafał, Bołłek, Jakub Iwański, Roman Stępniewski, Andrzej Wyszomłok
Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland

17:00 Epitaxial growth of crystalline CaF₂ on single-layer silicene H.08.04

D. Nazzari*, J. A. Genser*, V. Ritter*, O. Bethge, E. Bertagnolli*, T. Grasser, W. M. Weber*, A. Lugstein*

* Institute of Solid State Electronics, Technische Universität Wien, Gusshausstraße 25-25a, 1040 Vienna, Austria, Infineon Technologies Austria AG, Siemensstraße 2, 9500 Villach, Austria, \$ Institute for Microelectronics, Technische Universität Wien, Gusshausstraße 27-29, 1040 Vienna, Austria,

17:15 Molecular beam epitaxy of monolayer transition metal dichalcogenides on hBN H.08.05

W. Pacuski¹, M. Grzeszczyk¹, K. Nogajewski¹, A. Bogucki¹, K. Oreszczuk¹, A. Rodek¹, J. Kucharek¹, K.E. Polczyńska¹, B. Seredyński¹, R. Bołłek¹, K. Ludwiczak¹, A. K. Dąbrowska¹, J. Binder¹, M. Tokarczyk¹, J. Iwański¹, B. Kurowska², J. Turczyński², S. Kretz², T. Taniguchi³, K. Watanabe³, J. Sadowski^{1,2,4}, G. Kowalski¹, T. Kazimierczuk¹, R. Stępniewski¹, A. Wyszomłok¹, M. Potemski^{1,5}, P. Kossacki¹
¹ Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Pasteura St. 5, 02-093 Warsaw, Poland, ² Institute of Physics, Polish Academy of Sciences, al. Lotników 32/46, 02-668 Warsaw, Poland ³ National Institute for Materials Science, Tsukuba, 305-0047, Ibaraki, Japan ⁴ Department of Physics and Electrical Engineering, Linnaeus University, Kalmar, Sweden, ⁵ Laboratoire National des Champs Magnétiques Intenses, CNRS-UJF-UPS-INSA, 25, avenue des Martyrs, 38042 Grenoble, France

Poster session : C. Cornet, G. Bell, A. Trampert and F. Leroy

17:30 Optimization of in-situ growth of Al/InAs hybrid systems on GaAs for the development of Andreev qubits H.P.1

M. Kirti¹, M. Săltăreanu², E. Tălvăreanu², P. Makk², T. Prok², S. Csonka², P. Banerjee¹, P. Rajak¹, R. Ciancio¹, J. R. Plaisier³ and G. Biasiol¹

1: IOM CNR, Laboratorio TASC, Area Science Park Basovizza, 34149 Trieste, Italy, 2: Department of Physics, Budapest University of Technology and Economics and Nanoelectronics "Momentum" Research Group of the Hungarian Academy of Sciences, 1111 Budapest, Hungary, 3: Elettra-Sincrotrone Trieste S.C.p.A., Area Science Park Basovizza, Trieste, 34149, Italy

17:30 **Strained InGaAs/GaAs/AlGaAs SAM-APDs for X-ray detection**

H.P.2

T. Steinhartova 1, N. Benali 1, R.H. Menk 2,3,4, A. Pilotto 5, F. Driussi 5, P. Palestri 5, L. Selmi 6, F. Arfelli 3,7, M. Cautero 2, M. Colja 2, G. Cautero 2,3, G. Biasiol 1
1 IOM CNR, Laboratorio TASC, Area Science Park Basovizza, Trieste, 34149, Italy, 2 Elettra-Sincrotrone Trieste S.C.p.A, Area Science Park Basovizza, Trieste, 34149, Italy, 3 Istituto Nazionale di Fisica Nucleare, INFN, Sezione di Trieste, Trieste, 34100, Italy, 4 Department of Medical Imaging, University of Saskatchewan, Saskatoon, S7N 5A2, SK, Canada, 5 DPIA, University of Udine, Via delle Scienze 206, Udine, 33100, Italy, 6 DIEF, University of Modena and Reggio Emilia, Via Vivarelli 2, Modena, 44100, Italy, 7 Department of Physics, University of Trieste, Trieste, 34128, Italy

17:30 **Temperature dependence of the bandgap of {ZnCdO/ZnO}30 multiple quantum wells doped with Eu**

H.P.3

A. Lysak, E. Przełsdziecka R. Jakiela, Z. Khosravizadeh, M. Szot, A. Adhikari, A. Kozanecki
Institute of Physics, Polish Academy of Sciences, al. Lotnikow 32/46, Warsaw, Poland

17:30 **Determination of absolute "surface/interface" energies in heterogeneous materials and hetero-interfaces: A theoretical approach**

H.P.4

Laurent Pedesseau 1*, Lipin Chen 1, Ida Lucci 1, Divishth Gupta 1, Charles Cornet 1
1 Univ Rennes, INSA Rennes, CNRS, Institut FOTON " UMR 6082, F-35000 Rennes, France

17:30 **Ferroelectric nanodomains in epitaxial GeTe thin films**

H.P.5

Boris Croes, Fabien Cheynis, Yide Zhang, Cédric Voulot, Kokou Dodzi Dorkenoo, Salia Cherifi-Hertel, Cristian Mocuta, Michał Texier, Thomas Cornelius, Olivier Thomas, Marie-Ingrid Richard, Pierre Mäller, Stefano Curiotto, Frédéric Leroy

Aix Marseille Univ, CNRS, CINAM, AMUTECH, Marseille, France, Aix Marseille Univ, CNRS, CINAM, AMUTECH, Marseille, France, Université de Strasbourg, CNRS, Institut de Physique et Chimie des Matériaux de Strasbourg, Strasbourg, 67000, France, Université de Strasbourg, CNRS, Institut de Physique et Chimie des Matériaux de Strasbourg, Strasbourg, 67000, France, Université de Strasbourg, CNRS, Institut de Physique et Chimie des Matériaux de Strasbourg, Strasbourg, 67000, France, Synchrotron SOLEIL, L'Orme des Merisiers, St Aubin BP 48, F-91192 Gif Sur Yvette, France, Aix Marseille Univ, Univ Toulon, IM2NP, AMUTECH, CNRS, F-13397 Marseille 20, France, Aix Marseille Univ, Univ Toulon, IM2NP, AMUTECH, CNRS, F-13397 Marseille 20, France, Aix Marseille Univ, Univ Toulon, IM2NP, AMUTECH, CNRS, F-13397 Marseille 20, France, Univ Grenoble Alpes, CEA Grenoble, IRIG, MEM, NRS, 17 Rue Martyrs, F-38000 Grenoble, Aix Marseille Univ, CNRS, CINAM, AMUTECH, Marseille, France, Aix Marseille Univ, CNRS, CINAM, AMUTECH, Marseille, France, Aix Marseille Univ, CNRS, CINAM, AMUTECH, Marseille, France

- 17:30 **Influence of growth parameters on CdO layers grown by plasma-assisted MBE technique** **H.P.6**
A. Adhikari, A. Lysak, A. Wierzbicka, J. M. Sajkowski, R. Jakiela, K. Zeinab, E. Przelśdziecka

Institute of Physics, Polish Academy of Sciences, al. Lotnikow 32/46, Warsaw, Poland

- 17:30 **Fabrication of wafer-scale free-standing monocrystalline Ge membranes** **H.P.7**
Tadeusz Hanu?, Bouraoui Ilahi, Javier Arias Zapata, Alexandre Chapotot, Abderraouf Boucherif

TadeÅ~? Hanu? 1: Institut Interdisciplinaire d'Innovation Technologique (3IT) Universit   de Sherbrooke, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada 2: Laboratoire Nanotechnologies Nanosyst  mes (LN2) - CNRS IRL-3463, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada ,Bouraoui Ilahi 1: Institut Interdisciplinaire d'Innovation Technologique (3IT) Universit   de Sherbrooke, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada 2: Laboratoire Nanotechnologies Nanosyst  mes (LN2) - CNRS IRL-3463, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada ,Javier Arias?Zapata 1: Institut Interdisciplinaire d'Innovation Technologique (3IT) Universit   de Sherbrooke, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada 2: Laboratoire Nanotechnologies Nanosyst  mes (LN2) - CNRS IRL-3463, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada ,Alexandre Chapotot 1: Institut Interdisciplinaire d'Innovation Technologique (3IT) Universit   de Sherbrooke, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada 2: Laboratoire Nanotechnologies Nanosyst  mes (LN2) - CNRS IRL-3463, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada ,Abderraouf Boucherif 1: Institut Interdisciplinaire d'Innovation Technologique (3IT) Universit   de Sherbrooke, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada 2: Laboratoire Nanotechnologies Nanosyst  mes (LN2) - CNRS IRL-3463, 3000 Boulevard de l'Universit  , Sherbrooke, J1K 0A5, QC, Canada

17:30 **INITIAL STAGES OF NUCLEATION OF CARBIDE PHASES AND HETEROEPITAXIAL COATINGS DEPOSITION IN OXIDE MELTS** **H.P.8**

Stetsyuk T.1, Malyshev V.2, Gab A.2, Shakhnin D.2, Yovenko A.2

1 Frantsevich Institute for Problems of Materials Science of NAS of Ukraine, 2 Open International University of Human Development â€œUkraineâ€

17:30 **Driving up the quality of MOCVD-grown epitaxial wafers for highly innovative photonic applications** **H.P.9**

Iwona Pasternak, Walery Ko  kowski, W  odek Strupi  ski

Vigo Photonics, Poland, 05-850 O  lar  w Mazowiecki, ul.Pozna  ska 129/133

17:30 **Nanocube epitaxy for the realisation of printable silver monocrystalline structures and thin films** **H.P.10**

Anna Capitaine, Muhammad Luthfi Fajri, Peeranuch Pounsripong, Olivier Margeat, Beniamino Sciacca

Aix-Marseille Univ, CINaM, Aix-Marseille Univ, CINaM, Aix-Marseille Univ, CINaM, CNRS, CINaM, CNRS, CINaM

17:30 **Switching characteristics and negative capacitance regime in multi-bit ferroelectric-izolator-ferroelectric structures** **H.P.11**

L. D. Filip, A.G. Boni, C. Chirila, C. Radu, I. Pasuk, I. Pintilie, I. Pintilie

National Institute for Materials Physics, Atomistilor Str., no. 405A, Magurele, Romania

17:30 **In situ surface X-ray diffraction of Sb epitaxy**

H.P.12

Philip J. Mousley, Christopher W. Burrows, Chris Nicklin, Gavin R. Bell
Diamond Light Source, UK, University of Warwick, UK

17:30 **Molecular beam epitaxy of topological materials with in situ XPS**

H.P.14

Gavin R. Bell, Ibrahim Elhoussieny, Christopher Benjamin, Thomas Rehaag
University of Warwick, UK

17:30 **In-situ STEM-DPC study of (111)-oriented La_{0.7}Sr_{0.3}MnO₃ thin film: A sample preparation routine**

H.P.15

Yu Liu, Sivert Dagenborg, Damian Braozowski, Magnus Nord, Ingrid Hallsteinsen

Department of Materials Science and Engineering, Norwegian University of Science and Technology, Trondheim, Norway, Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway

17:30 **Molecular beam epitaxy growth of high optical quality GaAsBi/GaAs multiple quantum wells using two-substrate-temperatures**

H.P.16

Evelina Dudutienė, Algirdas Jasinskas, Monika Jokubauskaitė, Sandra Stanionytė, Martynas Skapas, Arnas Naujokaitis, Bronislovas Šechavičius, Renata Butkutė

State Research Institute Center for Physical Sciences and Technology

17:30 **Bi₂O₃ nanoparticle decorated TiO₂ nanotubes for hydrogen sensor**

H.P.17

Esme ISIK, Lutfi Bilal TASYUREK, Emir TOSUN, Necmettin KILINC

Esme ISIK, Malatya Turgut Ozal University, Malatya/Turkey Lutfi Bilal TASYUREK, Malatya Turgut Ozal University, Malatya/Turkey Emir TOSUN, Inonu University, Malatya/Turkey Necmettin KILINC, Inonu University, Malatya/Turkey

- 17:30 **Epitaxial Mn₅Ge₃Cx films – effect of carbon doping on magnetic anisotropy studied by means of ⁵⁵Mn NMR** **H.P.18**
- R. KALVIG (1), E. JÄDRYKA (1), M. WĄJCIK (1), M. PETIT (2), L. A. MICHEZ (2)
- (1) Institute of Physics PAN, Al. Lotników 32/46, 02-668 Warsaw, Poland (2) Aix Marseille Univ, CNRS, CINAM, Marseille, France
- 17:30 **Chemical Beam Epitaxy with Sybilla Equipment** **H.P.19**
- G. Benvenuti, E. Wagner, W. Maudez
3D-Oxides, 41 rue Henri Fabre, 01630 St Genis Pouilly
- 17:30 **Why Zn diffusion is often not a diffusion, and its strong implications for III-V device design** **H.P.20**
- A. Ozcan-Atar (1), A. Gocalinska (1), P.P. Michalowski (2), D.D. Vvedensky (3), E. Pelucchi (1)
- (1) Tyndall National Institute, University College Cork, Cork, Ireland, (2) ?ukasiewicz Research Network, Institute of Microelectronics and Photonics, Warsaw, Poland, (3) The Blackett Laboratory, Imperial College London, London, United Kingdom
- 17:30 **Doping of epitaxial PZT: impact on structural and electrical properties** **H.P.21**
- Cristina Florentina Chirila, Georgia Andra Boni, Viorica Stancu, Iuliana Pasuk, Lucian Trupina, Lucian Dragos Filip, Cristian Radu, Ioana Pintilie, Lucian Pintilie
National Institute of Materials Physics, Atomistilor 405A, Magurele, Romania
dragoi@infim.ro
- 17:30 **The Gas-Sensing Properties of ZnO/TiO₂ Composites** **H.P.22**
- L. Ghimpu¹, V. Suman¹, D. Rusnac², D. Timpu³, T. Potlog²
- ¹Institute of Electronic Engineering and Nanotechnologies, Academy of Sciences of Moldova, ¹Physics Department and Engineering, Moldova State University, Chisinau, Moldova ³Petru Poni Institute of Macromolecular Chemistry, Iasi, Romania
- 17:30 **Altering the optical and electrical properties of BN-based layers grown via MOCVD by changing the ammonia flow rate** **H.P.23**

Arkadiusz Ciesielski, Jakub RogoŹa, Piotr WrŹbel, Jan PawŹowski, Johannes Binder, Roman StŹpniewski, Andrzej WyszmoŹek

University of Warsaw, Faculty of Physics, Pasteura 5, 02-093 Warsaw, Poland

17:30 **Facile growth and characterisation of transition metal oxides deposited by spray pyrolysis for multifunctional applications** **H.P.24**

Ardak Ainabayev, Daragh Mullarkey, David Caffrey, Brian Walls, Christopher Smith, Karsten Fleischer and Igor Shvets.
School of Physics and Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN), Trinity College Dublin, Dublin 2, Ireland, and School of Physics and Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN), Trinity College Dublin, Dublin 2, Ireland, School of Physical Sciences, Dublin City University, Dublin 9, Ireland.

17:30 **Deposition and Study of the Hydrophilic Diamond-Like Carbon and Diamond-Like Nanocomposite Films** **H.P.25**

ŹarŹas Jankauskas, Andrius Vasiliauskas, Vitoldas Kopustinskas, Mindaugas AndrulaviŹius, Asta GuobienŹ, Brigita AbakeviŹienŹ, ŹarŹas MelŹkinis
Institute of Materials Science, Kaunas University of Technology, BarŹausko 59, Kaunas, Lithuania

WEDNESDAY, 21 SEPTEMBER 2022

Session 3 - Epitaxy of low-dimensional materials: substrate/epilayer interactions, nanostructures-4 : F. Cheynis

14:30 **Graphene and 2D transition metal selenides: synthesis and characterizations** **H.10.01**
Vera Marinova
Institute of Optical Materials and Technologies, Bulgarian Academy of Sciences, Sofia, Bulgaria

15:00 **Self-assembled Network of Nanostructures in Functional Oxide Thin Films** **H.10.03**

Z. Konstantinovic1, V. Fuentes2, Ll. Balcells2, A. Pomar2 and B. Martinez2

1 Center for Solid State Physics and New Materials, Institute of Physics Belgrade, University of Belgrade, Serbia, 2 Institut de Ciència de Materials de Barcelona, ICMA-
CSIC, Campus UAB, 08193 Bellaterra, Spain.

15:15 **Coffee Break**

Session 4 - Physical properties of epitaxial materials, relationships between structure, materials chemistry and targeted physical properties-1 : P. Ferreira

- 16:00 **Electron microscopy in oxide ferroelectrics thin films: Domain configuration and interface characterization** **H.11.01**
D. Rusu¹, J. J. P. Peters¹, T. P. A. Hase¹, S. D. Seddon¹, R. Beanland¹, M. Alexe¹, A.M. Sanchez^{1*}
Department of Physics, University of Warwick, Coventry, United Kingdom
- 16:30 **Quasi ternary alloys short period superlattices {CdO/MgO}_n and {CdO/ZnO}_n - band gap engineering** **H.11.03**
E. Przełsdziecka¹, A. Lysak¹, A. Adhikari¹, A. Wierzbicka¹, P. StrÄ...k², P. DŁuŁŁewski¹, R. Jakiela¹, K. Zeinab¹, P. Sybilski¹
¹Polish Academy of Sciences, Institute of Physics, Al. LotnikÄłw 32/46, 02-668 Warsaw, Poland ²Institute of High Pressure Physics, Polish Academy of Sciences, SokoŁowska 29/37, 01-142 Warsaw, Poland
- 16:45 **The influence of Mg and O on the Structural and Optical properties of PA-MBE grown Europium Doped ZnMgO Thin Films** **H.11.04**
J.A. Mathew, A. Lysak, V. Tsiumra, R.Jakiela, A. Wierzbicka, E. Przezdziecka, M. Stachowicz, A. kozanecki
Institute of Physics Polish Academy of Sciences, Aleja lotnikÄłw 32/46, Warszawa 02-668, Poland
- 17:00 **XMCD and GIXRD analysis of the interface between FeRh magnetic nanoclusters and perovskite oxides** **H.11.05**
S. Gonzalez(a*), I. C. Infante(a), B. Vilquin(a), P. Rojo-Romeo(a), S. Brottet(a), G. Herrera(b), C. Raton(b), A. Reyes(b), O. Boiron(b), F. Tournus(b), D. LeRoy(b), V. Dupuis(b), M. Bugnet(c), X. Weng(d), L. Martinelli(d), G. Renaud(e), A. Resta(f), A. Vlad(f), A. Coati(f), P. SchÄ¶ffmann(f), E. Otero(f), P. Ohresser(f)

a. Univ Lyon, CNRS, ECL, INSA Lyon, UCBL, CPE, INL, UMR 5270, 69621 Villeurbanne, France , b. Institut Lumi re Mati re, UMR 5306, CNRS Universit  Claude Bernard Lyon 1, France, c. Univ Lyon, CNRS, INSA Lyon, UCBL, MATEIS, UMR 5510, 69621 Villeurbanne, France, d. European Synchrotron Radiation Facility, 38000 Grenoble, France, e. Universit  Grenoble Alpes, CEA, INAC, MEM, 38000 Grenoble, France, f. Synchrotron SOLEIL, CNRS-CEA, L Orme des Merisiers, Saint-Aubin, 91192 Gif-sur-Yvette, France

THURSDAY, 22 SEPTEMBER 2022

Session 4 - Physical properties of epitaxial materials, relationships between structure, materials chemistry and targeted physical properties-2 : A. Sanchez

9:00 **Ordered functional porous ferroic layers** **H.12.01**

Paula Ferreira, Alichandra Castro, Paula M. Vilarinho

Department of Materials and Ceramic Engineering, CICECO   Aveiro Institute of Materials, University of Aveiro, 3810-193 Aveiro, Portugal

9:30 **Ferromagnetic stability in manganite/ruthenate heterostructures** **H.12.02**

Cinthia Piamonteze 1, Anna Zakharova 1, Marco Caputo 1, Eduardo Bonini Guedes 1, Francis Bern 2, S. R. V. Avula 1, M. Studniarek 1, C. Autieri 3, M. Ziese 2, M. Radovic 1, F. Nolting 1 and I. Lindfors-Vrejoiu 4

1 Swiss Light Source, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland, 2 Felix-Bloch-Institut fuer Festkoerperphysik, Universitaet Leipzig, Leipzig, Germany, 3 International Research Centre MagTop, Institute of Physics, Polish Academy of Sciences, Warsaw, Poland, 4 II. Physikalisches Institut, Universitaet zu Koeln, Koeln, Germany

9:45 **Optimization Substrate-Source Temperatures for ZnTe Solar Cells Grown by Close Space Sublimation Method** **H.12.03**

Tamara Potlog1, Ion Lungu1, Lidia Ghimpu2

1Physics Department and Engineering, Moldova State University 2 Institute of Electronic Engineering and Nanotechnologies, Academy of Sciences of Moldova, Chisinau, Moldova

10:00 **Enhancement of graphene-related and substrate-related Raman modes through dielectric layer deposition** **H.12.04**

Karolina Pietak [1,2], Jakub Jagiello [1], Artur Dobrowolski [1], Tymoteusz Ciuk [1]

[1] Łukasiewicz Research Network – Institute of Microelectronics and Photonics, Al. Lotnikow 32/46, 02-668 Warsaw, Poland [2] Faculty of Chemistry, Warsaw University of Technology, ul. Noakowskiego 3, 00-664 Warsaw, Poland

10:15 **Particularities of undoped and doped epitaxial PZT thin films**

H.12.05

Lucian Pintilie, Cristina Chirila, Luminita Hrib, Georgia Boni, Iuliana Pasuk, Cristian Radu, Cosmin Istrate, Lucian Trupina, Ioana Pintilie
National Institute of Materials Physics, Magurele, Romania

10:30 **Coffee Break**

Session 5 - Applications-oriented epitaxy: device architecture, doping, localized epitaxy & Advanced epitaxial materials for technological transfers-1 : A. Sawicka

11:00 **AlN/GaN nanowire heterostructures for UV-C light emitting devices**

H.13.01

R.Vermeersch,G.Jacopin,B.Gayral,J.Pernot,B.Daudin

Univ. Grenoble Alpes, CEA, IRIG-PHELIQS, NPSC, 17 rue des martyrs, 38000 Grenoble, France, Univ. Grenoble Alpes, Grenoble INP, CNRS, Institut Néel, 38000 Grenoble, France, Univ. Grenoble Alpes, CEA, IRIG-PHELIQS, NPSC, 17 rue des martyrs, 38000 Grenoble, France, Univ. Grenoble Alpes, Grenoble INP, CNRS, Institut Néel, 38000 Grenoble, France, Univ. Grenoble Alpes, CEA, IRIG-PHELIQS, NPSC, 17 rue des martyrs, 38000 Grenoble, France

OPTIMIZATION OF AlGaIn QUANTUM WELL GROWTH TECHNOLOGY FOR APPLICATIONS IN NEAR INFRARED VERTICAL-EXTERNAL-CAVITY SURFACE-EMITTING

11:30

H.13.02

Andrea Zelioli¹, Arnas Pukinskas¹, Algirdas Jasinskas¹, Simona Plakienė¹, Silvija Keraitytė^{1, 2}, Arnas Naujokaitis¹, Martynas Skapas¹, Monika Jokubauskaitė¹, Evelina Dudutienė¹, Artūras Suchodolskis¹, Bronislovas Šechavičius¹ and Renata Butkutė^{1, 2}

¹ Center for Physical Sciences and Technology, Vilnius, Lithuania ² Institute of Photonics and Nanotechnology, Faculty of Physics, Vilnius University, Lithuania

11:45 **Electro-optical characterization of Ge and Si micro-crystal photodetectors**

H.13.04

Virginia Falcone(1), Andrea Ballabio(1), Andrea Barzaghi(1), Carlo Zucchetti(1), Luca Anzi(1), Federico Bottegoni(1), Jacopo Frigerio(1), Roman Sordan(1), Paolo Biagioni(2) and Giovanni Isella(1).

1.LNESS Dipartimento di Fisica, Politecnico di Milano, Via Anzani 42, I-22100 Como, Italy
2.Dipartimento di Fisica, Politecnico di Milano, piazza Leonardo da Vinci 32, I-20133 Milano, Italy

12:00 Distributed Bragg Reflectors based on porous BN layers fabricated via MOCVD H.13.05

Arkadiusz Ciesielski, Jakub Iwański, Piotr Wróbel, Rafał, Bołłek, Aleksandra K. Dąbrowska, Sławomir Kret, Jakub Turczyński, Johannes Binder, Krzysztof P. Korona, Roman Stępniewski, Andrzej Wyszomirski

Arkadiusz Ciesielski, Jakub Iwański, Piotr Wróbel, Rafał, Bołłek, Aleksandra K. Dąbrowska, Johannes Binder, Krzysztof P. Korona, Roman Stępniewski, Andrzej Wyszomirski - University of Warsaw, Faculty of Physics, Pasteura 5, 02-093 Warsaw, Poland Sławomir Kret, Jakub Turczyński - Institute of Physics, Polish Academy of Sciences, Al. Lotników 32/46, 02-668 Warsaw, Poland

12:15 Lunch Break

Session 5 - Applications-oriented epitaxy: device architecture, doping, localized epitaxy & Advanced epitaxial materials for technological transfers-2 : B. Daudin

14:00 Electrochemical etching for blue laser diodes with nanoporous GaN cladding H.14.01

Marta Sawicka, Natalia Fiuczek, Grzegorz Muziol, Mateusz Hajdel, Marcin Siekacz, Anna Feduniewicz-Munda, Krzesimir Nowakowski-Szkudlarek, Henryk Turski, Mikołaj Łak, Oliwia Bilka, John J. Kelly, and Czesław Skierbiszewski

Institute of High Pressure Physics Polish Academy of Sciences ul. Unieścisłowska 29/27, 01-142 Warsaw, Poland Condensed Matter and Interfaces, Debye Institute for NanoMaterials Science, University of Utrecht, Princetonplein 1, Utrecht, the Netherlands

14:30 Fabrication of ultrathin platinum-gadolinium alloy films for hydrogen sensor applications H.14.02

N. Kilinc1, M. Erkovan2,3,* and S. Cardoso2

1Department of Physics, Faculty of Science & Arts, Inonu University, Malatya, Turkey,
 2Instituto de Engenharia de Sistemas E Computadores "Microsistemas e
 Nanotecnologias (INESC MN), Lisboa, Portugal, 3Department of Computer Engineering,
 Beykoz University, Istanbul, Turkey

14:45 **Epitaxial La₂/3Sr₁/3MnO₃ thin films on vicinal SrTiO₃ substrates for sensitive anisotropic magnetoresistive sensors operated at** **H.14.03**

L. G. Enger¹, S. Flament¹, O. Rousseau¹, I. N. Bhatti¹, B. Guillet¹, M. Lam Chok Sing¹, V. Pierron¹, S. Lebargy¹, J.M. Diez², A. Vera², I. Martinez², R. Guerrero², L. Perez^{2,3}, P. Perna², J. Camarero², R. Miranda², M. T. Gonzalez², L. MÄ©chin¹

1. Normandie Univ, UNICAEN, ENSICAEN, CNRS, GREYC, 14000 Caen, France, 2. IMDEA Nanociencia, Campus de Cantoblanco, 28049 Madrid, Spain, 3. Dept. Fisica de Materiales - Universidad Complutense de Madrid, Av. Complutense s/n 28040 Madrid, Spain

15:00 **Optimization of interlayer transition time in the strain compensated InGaAs/InAlAs QCL grown by MOVPE** **H.14.04**

Izel Perkitel^{1,2}, Ismail Altuntas^{1,2}, Ilkay Demir^{1,2}

1.Nanophotonics Research and Application Center, Sivas Cumhuriyet University, 58140 Sivas, Turkey 2.Department of Nanotechnology Engineering, Sivas Cumhuriyet University, 58140 Sivas, Turkey

15:15 **Epitaxial Lift-off of YSZ Thin Films Using an Epitaxial ZnO Sacrificial Underlayer on a YSZ (111) Substrate** **H.14.05**

D. J. Rogers¹, T. Maroutian², E. V. Sandana¹, F. H. Teherani¹, P. Bove¹, P. Lecouer²

1. Nanovation, 8 route de Chevreuse, ChÄ©teaufort, 78117, France. 2. Centre for Nanoscience and Nanotechnology, CNRS & UniversitÄ© Paris-Saclay, Palaiseau, France

15:30 **Surface Chemistry and Toxicity of Mesenchymal Stem Cells on Oxide Thin Films Deposited by Pulsed Laser Deposition** **H.14.06**

M. Khokhlova^{1,2}, Y. Abhishek¹, K. Boumediene², W. Prellier¹

1. Laboratoire CRISMAT, CNRS UMR 6508, ENSICAEN, UNICAEN, 6 Bd Marechal Juin, F-14050 Caen Cedex 4, France 2. Normandie UniversitÄ©, UNICAEN, BIOCONNECT, 14000, Caen, France



Symposium I

Sessions: Room 213 | Main Building

Poster Session: Small Hall | Main Building

Nanomaterials:

Group-IV semiconductor materials for nanoelectronics and cryogenic electronics

Symposium Organizers:

Daniel HILLER TU Freiberg Germany

Ray DUFFY Tyndall National Institute / University College Cork Ireland

Vihar GEORGIEV University of Glasgow UK

Walter WEBER TU Wien Austria

Symposium I Program

MONDAY, 19 SEPTEMBER 2022

Silicon Nanowire Electronics : Daniel Hiller

14:00 **Nanowire technologies for sub-5nm and beyond CMOS** **I.01.01**

T. Ernst, T. Dubreuil, S. Barraud
CEA-Leti, Université Grenoble Alpes, F-38000 Grenoble, France

14:30 **Insights into the Temperature-Dependent Switching Behaviour of Reconfigurable Field-Effect Transistors** **I.01.02**

Giulio Galderisi [1], Thomas Mikolajick [1,2], Jens Trommer [1]

[1] Nanoelectronic Materials Laboratory (NaMLab), Nöthnitzer Str. 64a, 01187 Dresden, Germany, [2] Chair for Nanoelectronics, TU Dresden, Nöthnitzer Str. 64, 01187 Dresden, Germany

15:00 **Monolithic and Single-Crystalline Al-Si Heterostructures enabling Reconfigurable Complementary and Combinational Logic** **I.01.03**

Lukas Wind [1], Masiar Sistani [1], Zgür Demirkiran [1], Raphael Bäckle [1], Peter Schweizer [2], Xavier Maeder [2], Johann Michler [2], Walter M. Weber [1]

[1] Institute of Solid State Electronics, TU Wien, Vienna, Austria, [2] Laboratory for Mechanics of Materials and Nanostructures, EMPA, Thun, Switzerland,

15:15 **Full-band quantum mechanical simulations of p-type silicon nanowires with two gates-all-around in series for silicon spin qubit** **I.01.04**

Hamilton Carrillo-Núñez, Cristina Medina-Bailon Vihar Georgiev and Asen Asenov

University of Glasgow

15:30 **Coffee Break**

Cryo Electronics : Vihar Georgiev

16:00 **Cryogenic Steep Slope Transistors** **I.02.01**

Joachim Knoch

Chair of Semiconductor Electronics and Institute of Semiconductor Electronics, RWTH Aachen University, Sommerfeldstraße 18, 52074 Aachen

16:30

Transistors 2.0: cryogenic temperature operation and device implications

I.02.02

Hung-Li Chiang, Iuliana Radu

Corporate Research, Taiwan Semiconductor Manufacturing Company

17:00

Gate-Tunable Negative Differential Resistance Enabling the Functional Diversification of Ge-Based Nanoelectronic Devices

I.02.03

Masiar Sistani[1], Raphael Bäckle[1], Alois Lugstein[1], Walter M. Weber[1] Minh Anh Luong[2], Martien I. den Hertog[2]

[1] Institute of Solid State Electronics, TU Wien, Vienna, Austria [2] Institut Néel, CNRS, Grenoble, France

TUESDAY, 20 SEPTEMBER 2022

Group-IV Quantum Dots : Ray Duffy

9:00

Hole spin qubits in planar Ge devices

I.03.01

Daniel Jirovec (1), Andrea Hofmann (1), Andrea Ballabio (2), Philipp M. Mütter (3), Giulio Tavano (2), Marc Botifoll (4), Alessandro Crippa (1), Josip Kukucka (1), Oliver Sagi (1), Frederico Martins (1), Jaime Saez-Mollejo (1), Ivan Prieto (1), Maksim Borovkov (1), Marek Rychetsky (5), David. L. Craig (5), Natalia Ares (6), Jordi Arbiol (4,7), Guido Burkard (3), Daniel Chrastina (2), Giovanni Isella (2), Georgios Katsaros (1)

1. Institute of Science and Technology Austria, Am Campus 1, 3400 Klosterneuburg, Austria 2. L-NESS, Physics Department, Politecnico di Milano, via Anzani 42, 22100 Como, Italy 3. Department of Physics, University of Konstanz, D-78457 Konstanz, Germany 4. Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and BIST, Campus UAB Bellaterra, Barcelona, Catalonia, Spain 5. Department of Materials, University of Oxford, Parks Road, Oxford OX1 3PH, United Kingdom 6. Department of Engineering Science, University of Oxford, Parks Road, Oxford OX1 3PJ, United Kingdom 7. ICREA, Passeig de Lluís Companys 23, 08010 Barcelona, Catalonia, Spain

9:30 **Silicon Nanocrystals: Is their internal structure as crystalline as we once thought... and does it matter?** **I.03.02**

Jonathan G.C. Veinot
Department of Chemistry, University of Alberta, Edmonton, Alberta T6G 2G2, Canada

9:45 **CMOS-compatible Manufacturing of Room-Temperature Single Electron Transistors** **I.03.03**

K.-H. Heinig¹, J. von Borany¹, H.-J. Engelmann¹, G. Hlawacek¹, R. Hälbner¹, F. Kläpfel³, W. Müller¹, M.-L. Pourteau², G. Rademaker², M. Rommel³, L. Baier³, P. Pichler³, R. Tiron²

¹ Helmholtz-Zentrum Dresden-Rossendorf (HZDR), D-01328 Dresden, Germany, ² Univ. Grenoble Alpes, CEA, LETI, F-38000 Grenoble, France, ³ Fraunhofer Institute for Integrated Systems and Device Technology (IISB), D-91058 Erlangen, Germany

10:00 **Nanocrystal formation by thermal treatment of Ge/Sn/TaZrOx superlattice structures.** **I.03.04**

F. Honeit, R. Hälbner, C. Räder, J. Beyer, J. Heitmann
Institute of Applied Physics, TU Bergakademie Freiberg, Leipziger Str. 23, 09599 Freiberg, Germany, Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, 01314 Dresden, Germany,

10:15 **Silicon nanocrystal synthesis with an atmospheric plasma source** **I.03.05**

Maren Dworschak, Niklas Kohlmann, Martin Müller, Lorenz Kienle, Jan Benedikt

Institute of Experimental and Applied Physics, Experimental Plasma Physics, Kiel University, Germany, Institute of Material Science, Synthesis and Real Structure, Kiel University, Germany, Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic, Institute of Material Science, Synthesis and Real Structure, Kiel University, Germany, Institute of Experimental and Applied Physics, Experimental Plasma Physics, Kiel University, Germany,

10:30 **Coffee Break**

Group-IV Epitaxial Materials : Walter Weber

11:00 **Pushing the limits of pseudomorphic epitaxial group-IV materials for optoelectronic and nanoelectronic applications** **I.04.01**

Moritz Brehm
Johannes Kepler University Linz, Austria

11:30 **The two-dimensional nature of GeSbTe alloys** **I.04.02**

Eugenio Zallo, Raffaella Calarco
Eugenio Zallo 1 - Paul-Drude-Institut für Festkörperelektronik, Leibniz-Institut im Forschungsverbund Berlin e.V., Hausvogteiplatz 5-7, 10117 Berlin, Germany 2 - Walter-Schottky-Institut and Physik Department, Technische Universität München, Am Coulombwall 4, 85748 Garching, Germany , Raffaella Calarco 1 - Paul-Drude-Institut für Festkörperelektronik, Leibniz-Institut im Forschungsverbund Berlin e.V., Hausvogteiplatz 5-7, 10117 Berlin, Germany 3 - Istituto per la Microelettronica e Microsistemi (IMM), Consiglio Nazionale delle Ricerche (CNR), Via del Fosso del Cavaliere 100, 00133, Rome, Italy

12:00 **Epitaxy of the group IV semiconductor materials** **I.04.03**

Maksym Myronov
Department of Physics, The University of Warwick, Coventry CV4 7AL, UK

12:30 **Lunch Break**

Poster Session : Walter Weber

17:30 **Directly grown Te nanowire electrodes and soft inductive-plasma etching for high-performance MoTe₂ field-effect transistors** **I.P.1**

Hyo-Chang Lee, Daehan Choi, Donghwan Kim, Yonghee Jo, J.H. Kim, Euijoon Yoon, TaeWan Kim

Korea Research Institute of Standards and Science Korea Research
Institute of Standards and Science Korea Research Institute of
Standards and Science Jeonbuk National University Korea Research
Institute of Standards and Science Seoul National University Jeonbuk
National University

17:30 **On the Origin of the Negative Fixed Charge at SiO₂/Al₂O₃ interfaces** **I.P.2**

Daniel Hiller [1], Dirk KÄ¶nig [2]
[1] Institute of Applied Physics (IAP), TU Bergakademie Freiberg,
Leipziger Str. 23, 09599 Freiberg, Germany [2] Integrated Materials
Design Lab (IMDL), Australian National University (ANU), Canberra ACT
2601, Australia

17:30 **Composition Dependent Electrical Transport in SiGe Nanosheets with Monolithic Single-Elementary Al Contacts** **I.P.3**

Masiar Sistani[1], Lukas Wind[1], Walter M. Weber[1] Lada Vukusic[2],
Johannes Aberl[2], Moritz Brehm[2] Peter Schweizer[3], Xavier
Maeder[3], Johann Michler[3]
[1] Institute of Solid State Electronics, TU Wien, Vienna, Austria [2]
Institute of Semiconductor and Solid State Physics, JKU, Linz, Austria
[3] Swiss Federal Laboratories for Materials Science and Technology,
Thun, Switzerland

17:30 **Silicon-oxide based MOS structures for Resistive RAM Devices** **I.P.4**

Piotr WiŁ>niewski, Jakub JasiŁ,,ski, Andrzej Mazurak, BartŁ,omiej Stonio,
Romuald B. Beck

Centre for Advanced Materials and Technologies CEZAMAT, Warsaw
University of Technology, Warsaw, 02-822, Poland, Institute of
Microelectronics and Optoelectronics, Warsaw University of Technology,
Warsaw, 00-662, Poland, Institute of Microelectronics and
Optoelectronics, Warsaw University of Technology, Warsaw, 00-662,
Poland, Centre for Advanced Materials and Technologies CEZAMAT,
Warsaw University of Technology, Warsaw, 02-822, Poland, Institute of
Microelectronics and Optoelectronics, Warsaw University of Technology,
Warsaw, 00-662, Poland, Centre for Advanced Materials and
Technologies CEZAMAT, Warsaw University of Technology, Warsaw, 02-
822, Poland, Institute of Microelectronics and Optoelectronics, Warsaw
University of Technology, Warsaw, 00-662, Poland,

17:30 **Towards Lateral and Self-Aligned SiGe Tunnel-FETs with Local SiGeSn Heterostructure** **I.P.5**

Michail Michailow, Oliver Steuer, Slawomir Prucnal, Moazzam Khan,
Florian BÄrwolf, Yordan Georgiev, Joachim Knoch

Chair of Semiconductor Electronics and Institute of Semiconductor
Electronics, RWTH Aachen University, Sommerfeldstr. 18, 52074
Aachen Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion
Beam Physics and Materials Research, 01328 Dresden, Germany

WEDNESDAY, 21 SEPTMEBER 2022

Silicon Quantum Technology : Vihar Georgiev

14:00 **Could silicon enable a quantum computing revolution?** **I.06.01**

M. Fernando Gonzalez Zalba
Quantum Motion

14:30 **Rejuvenation of magneto-optical spectroscopy of silicon defects: promising single photon sources and qubits** **I.06.02**

Adam Gali, PÄter Udvarhelyi, Anton Pershin, BÄlint Somogyi, GergÄ
Thiering
Department of Atomic Physics, Institute of Physics, Budapest University
of Technology and Economics, MÄgyetem rakpart 3., H-1111,
Budapest, Hungary & Wigner Research Centre for Physics, P.O. Box 49,
Budapest, H-1525, Hungary

15:00 **Telecom-wavelength single-photon sources in silicon for scalable photonic quantum technology** **I.06.03**

Yonder BerencÄn
Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics
and Materials Research, 01328 Dresden, Germany

15:30 **Coffee Break**

THURSDAY, 22 SEPTMBER 2022

Doping and Surface Functionalization : Ray Duffy

14:00 **Hyperdoping of group-IV Semiconductors by Pulsed Laser Melting** **I.07.01**

Enrico Napolitani

- 14:30 **Fabrication and evaluation of different passivation layers for the Ge-Insulator interface using Plasma-Enhanced ALD** **I.07.02**
- D. Nazzari , O. Solfronk, M. Mustajbasic, M. Sistani, W. M. Weber
- Institute of Solid-State Electronics, TU Wien, Gußhausstraße 25-25a,
1040 Austria
- 14:45 **Ultrasmall Si encapsulated in SiO₂** **I.07.03**
- Michael Frentzen 1), Dirk Kählig 1,2), Noel Wilck 1), Stefan Scholz 1), Birger Berghoff 1), Daniel Hiller 3), Joachim Knoch,
- 1) Institute of Semiconductor Electronics, RWTH Aachen University, 52074 Aachen, Germany, 2) Integrated Materials Design Lab (IMDL), Australian National University, ACT 2601, Australia, 3) Institute of Applied Physics (IAP), Technische Universität Bergakademie Freiberg, 09599 Freiberg, Germany
- 15:00 **Modulation-Doped Silicon Nanowires via Aluminum-Induced Acceptor States in SiO₂** **I.07.04**
- Ingmar Ratschinski [1], Soundarya Nagarajan [2], Jens Trommer [2], Thomas Mikolajick [2,3], Daniel Hiller [1]
- [1] Institute of Applied Physics (IAP), TU Bergakademie Freiberg, Leipziger Str. 23, 09599 Freiberg, Germany [2] Nanoelectronic Materials Laboratory (NaMLab), Nöthnitzer Str. 64a, 01187 Dresden, Germany [3] Institute of Semiconductors and Microsystems, TU Dresden, Nöthnitzer Str. 64, 01187 Dresden, Germany
- 15:15 **Phase transitions of ultrathin transition metal silicides investigated by a combination of in situ and ex situ ion scattering me** **I.07.05**
- Philipp M. Wolf (1), Henrik Bruce (1), Wilma Hallén (1), Eduardo Pitthan (1), Zhen Zhang (2), Christian Lavoie (3), Tuan T. Tran (1), and Daniel Primetzhofer (1)

(1) Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden, (2) Solid State Electronics, Department of Electrical Engineering, Uppsala University, Uppsala, Sweden, (3) IBM Thomas J. Watson Research Center, Yorktown Heights, New York, USA

15:30

Coffee Break

Ge-based Nano-Devices : Daniel Hiller

16:00

Hafnium-based ferroelectric artificial synapses on semiconductors for low power in-memory computing

I.08.01

Athanasios Dimoulas, Nikitas Siannas, Christina Zacharaki, Polychronis Tsipas

1. National Centre for Scientific Research "Demokritos", 15310, Athens, Greece: Athanasios Dimoulas, Nikitas Siannas, Christina Zacharaki, Polychronis Tsipas 2. Department of Physics, National and Kapodistrian University of Athens, 157 84, Athens, Greece: Nikitas Siannas, Christina Zacharaki

16:30

GROUP IV NANOWIRES: A VERSATILE TOOLBOX FOR NANO- AND OPTOELECTRONIC DEVICES

I.08.02

Muhammad Bilal Khan^{1,2}, Ahmad Echresh¹, Sayantan Ghosh¹, Himani Arora¹, Phanish Chava^{1,2}, Shima Jazavandi Ghamsari¹, Muhammad Moazzam Khan¹, Oliver Steuer¹, Slawomir Prucnal¹, René Häubner¹, Lars Rebohle^{1,2}, Shengqiang Zhou¹, Manfred Helm^{1,3,4}, Artur Erbe^{1,3}, Yordan M. Georgiev^{1,3,5}

1 Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Bautzner Landstrasse 400, 01328 Dresden, Germany, 2 International Helmholtz Research School for Nanoelectronic Network, HZDR, Bautzner Landstrasse 400, 01328 Dresden, Germany, 3 Technische Universität Dresden, Centre for Advancing Electronics Dresden (CfAED), 01069 Dresden, Germany, 4 Technische Universität Dresden, Institute of Applied Physics, 01069 Dresden, Germany, 5 Institute of Electronics, Bulgarian Academy of Sciences, 72, Tsarigradsko Chausse Blvd., 1784 Sofia, Bulgaria

17:00

Closing Remarks



Symposium K

Sessions: Room 134 | Main Building

Poster Session: Small Hall | Main Building

Nanomaterials:

Materials- nanoelectronics and nanophotonics

Symposium Organizers: **Dawid JANAS** Silesian University of Technology Poland

Devesh Kumar AVASTHI University of Petroleum and Energy Studies (UPES) India

Rosaria PUGLISI CNR – IMM Italy

Teresa MONTEIRO University of Aveiro Portugal

Yogendra Kumar MISHRA University of Southern Denmark

Symposium K Program

MONDAY, 19 SEPTEMBER 2022

Advanced Nanoelectronics : Yogendra Kumar Mishra, Dawid Janas, Rosaria Puglisi

8:00 **Welcome Session by Symposium K Organizers** **K.01.01**
Yogendra Mishra, Dawid Janas, Rosaria Puglisi
Organizers Symposium K

8:15 **Printed Inorganic Nanostructures based Electronic Layers for High Performance Flexible and Transient Electronics** **K.01.02**

Adamos Christou, Ayoub Zumeit, Abhishek Singh Dahiya, and Ravinder Dahiya

James Watt School of Engineering, University of Glasgow, G12 8QQ, UK

8:45 **Inkjet printed flexible piezoelectric pressure sensor based on PVDF-TrFE and Amine-functionalized graphene oxide nanocomposite** **K.01.03**
Hamed Abdolmaleki, Shweta Agarwala

Department of electrical and computer engineering, Aarhus University, Denmark

9:00 **Computational study of the amorphous aluminium oxide barrier length of Josephson Junctions.** **K.01.04**
Paul Lapham, Vihar Georgiev
University of Glasgow

9:15 **Wearable Microneedle-Based Extended Gate Transistor Biosensor for Real-Time Detection of Biomarkers in Interstitial Fluids** **K.01.05**
Rawan Omar, Youbin Zheng, Hossam Haick

Department of Chemical Engineering and Russell Berrie Nanotechnology Institute, Technion-Israel Institute of Technology, Haifa 3200003, Israel

9:30 **Intercalation-mediated Artificial Two-terminal Ionic Synapses towards Neuromorphic Computing** **K.01.06**
Ji Hyun Baek and Ho Won Jang*

Department of Materials Science and Engineering, Research Institute of Advanced Materials, Seoul National University, Seoul 08826, Republic of Korea

9:45 **Threshold and Resistive Switches via Tailoring Ag-incorporation into Halide Perovskite for Memristive Crossbar Array** **K.01.07**
In Hyuk Im, Ho Won Jang

1. Department of Materials Science and Engineering, Research Institute of Advanced Materials, Seoul National University, Seoul, 08826 Republic of Korea, 1. Department of Materials Science and Engineering, Research Institute of Advanced Materials, Seoul National University, Seoul, 08826 Republic of Korea / 2. Advanced Institute of Convergence Technology, Seoul National University, Suwon, 16229 Republic of Korea

10:00 **Broad compositional range and post treatment of DC magnetron sputtered AZO films** **K.01.08**

Vilko Mandić, Ivana Pančić, Arijeta Bafti, Ivan Peretin
Faculty of Chemical Engineering and Technology, Marulićev trg 20, 10000 Zagreb, Croatia

10:30 **Coffee Break**

Tunable Photonics : Saskia Fiedler, Rosaria Puglisi, Yogendra Mishra

11:00 **Tunable Photonics- A Phase-Change Material (PCM) Based Approach** **K.02.01**
Dr. Sunny
India Institute of Information Technology, Allahabad, India

11:30 **Mechanically tuneable metasurface with large gamut of colour** **K.02.03**
Rui Fang, Dagou Zeze, Mehdi Keshavarz Hedayati
Durham University

11:45 **Lunch Break**

Perovskite Nanomaterials : Susanta Roy, Yogendra Kumar Mishra, Dawid Janas

13:00 **Directionality of vibrations in layered metal halide perovskites** **K.03.01**

Balaji Dhanabalan, Beatriz Martin-Garcia, Davide Spirito, Sergey Artyukhin, Miao-Ling Lin, Yu-Chen Leng, Ping-Heng Tan, Seda Kutkan, Milena Arciniegas, Roman Krahne

Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy, CIC nanoGUNE, Tolosa Hiribidea, 76, 20018 Donostia-San Sebastian, Spain, IHP-Leibniz-Institut für innovative Mikroelektronik, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany, State Key Laboratory of Superlattices and Microstructures, Institute of Semiconductors, Chinese Academy of Sciences, 100083 Beijing, China

13:30 Stable Tin-based Layered Perovskites through Room Temperature Synthesis K.03.02

Aarya Prabhakaran, Balaji Dhanabalan, Simone Lauciello, Liberato Manna, Milena Arciniegas.

Nanochemistry, Istituto Italiano di Tecnologia, Via Morego 30, 16163, Genova, Italy. , Dipartimento di Chimica e Chimica Industriale, Università degli Studi di Genova, Via Dodecaneso, 31, 16146, Genova, Italy, Nanochemistry, Istituto Italiano di Tecnologia, Via Morego 30, 16163, Genova, Italy. , Nanochemistry, Istituto Italiano di Tecnologia, Via Morego 30, 16163, Genova, Italy. , Nanochemistry, Istituto Italiano di Tecnologia, Via Morego 30, 16163, Genova, Italy., Nanochemistry, Istituto Italiano di Tecnologia, Via Morego 30, 16163, Genova, Italy.

13:45 The challenging coating of II-V quantum dots: synthesis and optical properties of Cd3P2/Zn3P2 core-shell nanocrystals K.03.03

Benjamin F.P. McVey 1, Robert A. Swain 1, Delphine Lagarde 1, Wilfried-Solo Ojo 1, Kaltoum Bakkouche 1, Cécile Marcelot 3, Bénédicte Warot 3, Yann Tison 2, Hervé Martinez 2, Bruno Chaudret 1, Céline Nayral 1 and Fabien Delpech *1

1 : LPCNO, Université de Toulouse, CNRS, INSA, UPS, 135 Avenue de Rangueil, 31077 Toulouse, France , 2 : Institut des Sciences Analytiques et de Physico-Chimie pour l'Environnement et les Matériaux (IPREM-ECP), Université de Pau et des Pays de l'Adour, Hélioparc, 2 Av. Président Angot, F-64053 Pau, France , 3 : CEMES CNRS UPR 8011 and Université de Toulouse, 29 rue Jeanne Marvig, BP 94347, 31055 Toulouse cedex 4, France

14:00 Colloidal synthesis of lead-free Cs2TiBr6-xI_x and Cs2Ti1-xSnxI6 vacancy-ordered perovskite nanocrystals. K.03.05

Shanti Maria Liga, Gerasimos Konstantatos

ICFO, The Institute of Photonic Sciences, ICREA, Catalan Institution for Research and Advanced Studies

14:15 **Biogenic Ligands Enable Enhanced Stability and Efficiency of CsPbBr₃ Nanocrystals Hybrid Light-Emitting Diodes** **K.03.06**

Yanyan Duan, Kalyani Chordiya, Mousumi Upadhyay Kahaly, Freddy E. Oropeza, Víctor A. de la Peña-Oshea, De-Yi Wang, and Rubén D. Costa
Yanyan Duan, De-Yi Wang, IMDEA Materials Institute, Calle Eric Kandel 2, 28906 Getafe, Spain, Kalyani Chordiya, Mousumi Upadhyay Kahaly, ELI-ALPS, ELI-HU Non-Profit Ltd., Wolfgang Sandner utca 3., Szeged, H-6728, Hungary, Freddy E. Oropeza, Víctor A. de la Peña-Oshea, Photoactivated Processes Unit, IMDEA Energy Institute, Avda. Ramón de la Sagra, 3, Mostoles, Madrid 28935, Spain, Rubén D. Costa, Chair of Biogenic Functional Materials, Technical University of Munich. Schulgasse 22, Straubing D-94315, Germany

14:30 **Exciton Energy transfer in Perovskite-TMDC (0D-2D) Hybrid System** **K.03.07**

Aswin Asaithambi, Nastaran Kazemi Tofighi, Nicola Curreli, Manuela De Franco, Aniket Patra, Nicol  Petrini, Dmitry Baranov, Liberato Manna, Francesco Di Stasio, and Ilka Kriegel.

Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy.

14:45 **(S)TEM characterization of CsPbBr₃ nanocrystals with applications in solar cells** **K.03.08**

N. Fernández-Delgado*1, M. Herrera1, J. Hernández-Saz2, C. Romero-P rez3, M. E. Calvo 3, H. M guez3, S. I. Molina1

1. Department of Material Science, Metallurgical Engineering and Inorganic Chemistry IMEYMAT, Facultad de Ciencias, University of C diz, 2. Department of Engineering and Materials Science and Transport, University of Sevilla, 3. Institute of Materials Science of Seville, Spanish National Research Council, University of Seville,

15:00 **Coffee Break**

Plasmonic Nanomaterials : Sunny Sharma, Saskia Fiedler, Cenk Aktas, Rosaria Puglisi

15:30 **Plasmonic Porous Ceramics** **K.04.01**

Tongwei Guo, Md Nurul Karim, Kowsik Ghosh, M. Mangir Murshed, Kurosch Rezwan, Michael Maas

Tongwei Guo, Advanced Ceramics, University of Bremen, Am Biologischen Garten 2, IW3, Bremen, Germany, Md Nurul Karim, Advanced Ceramics, University of Bremen, Am Biologischen Garten 2, IW3, Bremen, Germany, Kowsik Ghosh, Institute of Inorganic Chemistry and Crystallography, University of Bremen, Leobener Straße 7, NW2, Bremen, Germany, M. Mangir Murshed, Institute of Inorganic Chemistry and Crystallography, University of Bremen, Leobener Straße 7, NW2, Bremen, Germany, MAPEX-Centre for Material and Processes, University of Bremen, Am Fallturm 1, Bremen, Germany, Kurosch Rezwan, Advanced Ceramics, University of Bremen, Am Biologischen Garten 2, IW3, Bremen, Germany. MAPEX-Centre for Material and Processes, University of Bremen, Am Fallturm 1, Bremen, Germany, Michael Maas, Advanced Ceramics, University of Bremen, Am Biologischen Garten 2, IW3, Bremen, Germany. MAPEX-Centre for Material and Processes, University of Bremen, Am Fallturm 1, Bremen, Germany.

- 15:45 **Tailoring the plasmonic response of gold nanoparticles films in-situ on a water surface** **K.04.02**

Michal Bodik, Bin Lu, Andreas Stemmer

Nanotechnology Group, ETH Zürich, Säumerstrasse 4, 8803 Rüschlikon, Switzerland

- 16:00 **Synthetic control over plasmonic magnesium nanoparticles** **K.04.03**

Elizabeth R. Hopper, Thomas M. R. Wayman, Christina Boukouvala, Jérémie Asselin, Vladimir Lomosov, Laura Torrente-Murciano, Emilie Ringe
University of Cambridge

- 16:15 **Plasmonic nanoparticles growth in polymeric thin films in situ monitored by spectroscopic ellipsometry** **K.04.04**

Patrick KFOURY(a), Yann BATTIE(a), Aotmane EN NACIRI(a), Michel VOUE(b) and Nouari CHAOUI(a)

a LCP-A2MC, Université de Lorraine, ICPM, 1 Bd Arago 57070 Metz, France, b LPMO, Université de Mons, Institut de Recherche en Science et Ingénierie des Matériaux, Place du Parc, 20, 7000 Mons, Belgique

- 16:30 **Gold nanoparticles functionalized with ligands containing electro- and photoactive groups** **K.04.05**

Bartłomiej Bołczak

Institute of Physical Chemistry Polish Academy of Sciences Kasprzaka 44/52 01-224 Warsaw, Poland

- 16:45 **Designer Nanoporous Metallic Films As Promising Nanomaterials** **K.04.06**

Hyunah Kwon, Hannah-Noa Barad, Alex Ricardo Silva Olaya, Mariana Alarcon-Correa, Gunther Wittstock, Peer Fischer

Max Planck Institute for Intelligent Systems, Max Planck Institute for Intelligent Systems, Carl von Ossietzky University of Oldenburg, Max Planck Institute for Intelligent Systems, Carl von Ossietzky University of Oldenburg, Max Planck Institute for Intelligent Systems, Heidelberg University

17:00 **Fabrication of bottom-up core-shell nanorod LEDs using a thick nano mask** **K.04.07**
Sohyeon Park, Ho Won Jang*
Seoul National University

17:15 **Advanced photonic processes for perovskite-based energy storage devices** **K.04.08**

Athanasia Kostopoulou [a*], Konstantinos Brintakis [a], Dimitra Vernardou [b], Emmanuel Stratakis [a,c*]
[a] Institute of Electronic Structure and Laser, Foundation for Research and Technology - Hellas, Heraklion, 71110, Crete, Greece, [b] Department of Electrical & Computer Engineering, School of Engineering, Hellenic Mediterranean University, Heraklion, 710 04, Crete, Greece, [c] Physics Department, University of Crete, Heraklion, 710 03 Crete, Greece

TUESDAY, 20 SEPTEMBER 2022

Carbon Nanomaterials : Dawid Janas, Rosaria Puglisi, Yogendra Mishra

8:15 **Development of a novel electrochemical sensor based on flexible laser induced graphene and carbon nanowalls for the detection of paraquat in water** **K.05.01**
Susanta Sinha Roy^{1*}, Sourav Sain¹, Robert Bogdanowicz²

¹Department of Physics, School of Natural Sciences, Shiv Nadar University, Greater Noida, India ²Department of Metrology and Optoelectronics, Faculty of Electronics, Telecommunications and Informatics, Gdansk University of Technology, 11/12 G. Narutowicza St., 80-233 Gdansk, Poland.

8:45 **New adventures in filling carbon nanotubes with the ultimate in low dimensional crystals.** **K.05.02**

Jeremy Sloan, Reza J. Kashtiban, Zizi Hu, Charlotte Slade, Natalya Kalashnyk, Andriy Vasylenko, Christopher E. Patrick, Quentin Ramasse, James Lloyd Hughes, Eric Faulques, Victor G. Ivanov, Ana Sanchez, Richard I. Walton, Slawomir Kret
University of Warwick, Departments of Physics and Chemistry, University of Liverpool, Department of Chemistry, University of Oxford, Department of Materials, STFC SuperSTEM, IMN University of Nantes, CNRS, Institut des Matériaux Jean Rouxel, IMN, Nantes, Laboratoire de Physique des Matériaux et des Surfaces, CY Cergy Paris University, Sofia University, Faculty of Physics, Sofia, Institute of Physics, Polish Academy of Sciences, Warsaw

9:00 **Aerosol CVD synthesis of highly conductive single-walled carbon nanotube films with a dual carbon feedstock** **K.05.03**

Eldar Khabushev, Dmitry Krasnikov, Anastasia Goldt, Albert Nasibulin, Tanja Kallio
Eldar Khabushev: School of Chemical Engineering, Aalto University, Espoo, Finland,
Dmitry Krasnikov: Skolkovo Institute of Science and Technology, Moscow, Russia,
Anastasia Goldt: Skolkovo Institute of Science and Technology, Moscow, Russia, Albert Nasibulin: Skolkovo Institute of Science and Technology, Moscow, Russia, Tanja Kallio: School of Chemical Engineering, Aalto University, Espoo, Finland

9:15 **Ion beam irradiation induced modification in carbon nanomaterials** **K.05.04**

Sunil Kumar, Marko Karlusic, Damjan Ivekovic, Andreja Gajovic, A. Tripathi and D K Avasthi
Ruder Boskovic Institute, Zagreb 10000Croatia

9:30 **Synergy effects in dielectric properties of MWCNT/magnetic nanoparticles epoxy resin composites** **K.05.05**

J. Macutkevici¹, D. Meisak¹, J. Banys¹, P. Kuzhir²

1- Vilnius University, Physics Faculty, Sauletekio al. 9 LT-10222 Vilnius, Lithuania 2- Institute of Photonics, University of Eastern Finland, Yliopistokatu st. 7 FI-80101 Joensuu, Finland

9:45 **Laser induced incorporation of CNTs in graphene electrodes improves flexibility and conductivity** **K.05.06**

Asmita Dutta, Arie Borenstein

Ariel University, Israel 65, Ramat HaGolan Street, Ariel, Israel. Pin-40700

10:00 **Coffee Break**

Graphene & 2D Materials : Dawid Janas, Susanta Roy, Yogendra Mishra

10:30 **Method for layer-resolved Raman mapping of transferred graphene** **K.06.01**

Artur Dobrowolski, Jakub Jagiełło, Karolina Piątko, Tymoteusz Ciuk

Lukasiewicz Research Network- Institute of Microelectronics and Photonics, Aleja Lotników 36/46 02-668 Warsaw, Poland

10:45 **Enhancement in the photoresponse of MoS₂ photodetector by a quasi-dry layer transfer technique** **K.06.02**

Madan Sharma, Aditya Singh, Bhera Ram Tak, and Rajendra Singh

Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India, Department of Electrical Engineering, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India, Nanoscale Research Facility (NRF), Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India

11:00 **Model and growth optimization of a multilayer switching device based on the VO₂ phase transition** **K.06.04**

Gina Ambrosio^{1,*}, Marco Gandolfi¹, Andrea Tognazzi^{2,1}, Bohan Li³, Rocio Camacho-Morales³, Domenico de Ceglia¹, Dragomir Neshev³, Costantino De Angelis¹ and Camilla Baratto¹

¹ CNR-INO and Department of Information Engineering, University of Brescia, 25123, Brescia, Italy ² Department of Engineering, University of Palermo, 90128, Palermo, Italy ³ ARC Centre of Excellence for Transformative Meta-Optical Systems (TMOS), Research School of Physics, The Australian National University, Canberra ACT 2601, Australia *gina.ambrosio@ino.cnr.it

11:15 **Development and Application of 2D Nanostructures with Tunable Surface Lattice Resonance** **K.06.06**

Nadzeya Khinevich, Mindaugas Juodėnas, Asta Tamulevičienė, Tomas Tamulevičius, Martynas Talaikis, Gediminas Niaura, Sigita Tamulevičiūtė

Institute of Materials Science, Kaunas University of Technology, K. Baršausko St. 59 LT-51423 Kaunas, Lithuania, Institute of Materials Science, Kaunas University of Technology, K. Baršausko St. 59 LT-51423 Kaunas, Lithuania. Physics Department, Chalmers University of Technology, Gothenburg 41296, Sweden., Institute of Materials Science, Kaunas University of Technology, K. Baršausko St. 59 LT-51423 Kaunas, Lithuania. Department of Physics, Kaunas University of Technology, Studentų St. 50, Kaunas LT-51423, Lithuania. UAB Nanoversa, K. Baršausko St. 59 LT-51423 Kaunas, Lithuania., Institute of Materials Science, Kaunas University of Technology, K. Baršausko St. 59 LT-51423 Kaunas, Lithuania. Department of Physics, Kaunas University of Technology, Studentų St. 50, Kaunas LT-51423, Lithuania. UAB Nanoversa, K. Baršausko St. 59 LT-51423 Kaunas, Lithuania., Vilnius University Life Sciences Center, Sauletekio av. 7, LT-10257 Vilnius, Lithuania., Vilnius University Life Sciences Center, Sauletekio av. 7, LT-10257 Vilnius, Lithuania., Institute of Materials Science, Kaunas University of Technology, K. Baršausko St. 59 LT-51423 Kaunas, Lithuania. Department of Physics, Kaunas University of Technology, Studentų St. 50, Kaunas LT-51423, Lithuania.,

11:30 **Sculpting 2D TMD semiconducting nano-circuits**

K.06.06

G. Zambito (1), M. C. Giordano (1), M. Gardella (1), F. Buatier de Mongeot (1)

(1) Dip. di Fisica, Università di Genova, Via Dodecaneso 33, 16146 Genova, Italy

12:00 **Lunch Break**

Layers Materials : Dawid Janas, Sunny Sharma, Rosaria Puglisi

13:00 **Controlled Formation of Dual Block Copolymer Morphologies in Ultrathin Films on Topographical Substrates**
Roy Shenhar

K.07.01

Institute of Chemistry and the Center for Nanoscience and Nanotechnology, The Hebrew University of Jerusalem, Jerusalem 9190401, Israel

13:30 **Optothermal Raman Spectroscopy of 2D materials on metal substrates.**

K.07.03

Emiliano Bonera,(1) Eleonora Bonaventura,(1,2) Riccardo Loss,(1) Daya Dunghana,(2) Carlo Grazianetti,(2) Christian Martella,(2) and Alessandro Molle(2)

(1) Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, via Cozzi 55, 20125 Milano, Italy (2) CNR-IMM Unit of Agrate Brianza, via C. Olivetti 2, Agrate Brianza, Italy

13:45 **Study of a Vertical 2D/3D Semiconductor Heterostructure Based on GaSe and Ga2O3** **K.07.04**

Sahin Sorifi1*, Shuchi Kaushik1, Hardhyan Sheoran1 and Rajendra Singh1,2,3

1Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India, 2Nanoscale Research Facility, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India, 3Nanoscale Research Facility, Indian Institute of Technology Delhi, New Delhi, India-110016, *Email: sahinsorifi111@gmail.com

14:00 **Highly Organized Restacking of 2D Nanosheets Based Lamellar Phase Obtained by Cation Exchange** **K.07.05**

Lina Cherni 1, Karin El Rifaii 2, Patrick Davidson 2, Jean-Christophe P. Gabriel 1

1 Université Paris-Saclay, Commissariat à l'Énergie Atomique et aux Energies Alternatives, CNRS, NIMBE, LICSEN, 91191, Gif-sur-Yvette, France. 2 Laboratoire de Physique des Solides, Université Paris-Saclay, CNRS, 91405 Orsay, France.

14:15 **FexGeTe2 2D ferromagnet /Bi2Te3 topological insulator heterostructures grown by molecular beam epitaxy** **K.07.06**

E. Georgopoulou-Kotsaki1, 2, P. Pappas1, A. Lintzeris1,3, P. Tsipas1, A. Markou4, A. Dimoulas1

1National Centre for Scientific Research Demokritos, Institute of Nanoscience and Nanotechnology, Agia Paraskevi, 15341, Athens, Greece. 2Section of Condensed Matter Physics, Department of Physics, National and Kapodistrian University of Athens, Panepistimiopolis Zografou, 15784, Athens, Greece. 3Department of Physics, National Technical University of Athens, School of Applied Mathematical and Physical Sciences, 15780, Athens, Greece. 4 Max Planck Institute for Chemical Physics of Solids, 01187, Dresden, Germany.

14:30 **Ferroelectric Tunnel Junction based on Hafnium Zirconium Oxide with Ultrathin SrTiO3 Interlayer** **K.07.07**

Sunghyuk Park, Ho Won Jang

Department of Materials Science and Engineering, Seoul National University, Seoul, 08826 Republic of Korea, Department of Materials Science and Engineering, Seoul National University, Seoul, 08826 Republic of Korea Advanced Institute of Convergence Technology, Seoul National University, Suwon, 16229 Republic of Korea

- 14:45 **Optical optimization with microstructure evolution inspired from lepidopteran scales** **K.07.08**
 Xinkun Zhao
 Shanghai Jiao Tong University
- 15:00 **Coffee Break**

Healthcare Materials : Saskia Fiedler, Dawid Janas, Cenk Aktas, Yogendra Mishra

- 15:30 **Nanoengineered Surfaces for Functional Applications: Self-Cleaning/Wetting Control /SERS-PIERS** **K.08.01**

Salih Veziroglu¹, Josiah Shondo¹, Yogendra Kumar Mishra², Aydin Gölles³, Franz Faupel¹ and Oral Cenk Aktas^{1,4}
¹Chair for Multicomponent Materials, Institute of Materials Science, Kiel University (CAU), 24143 Kiel, Germany ²Mads Clausen Institute, NanoSYD, University of Southern Denmark, Alsion 2, Sønderborg 6400, Denmark ³Department of Oral and Maxillofacial Surgery, University Hospital Schleswig-Holstein Kiel, Germany ⁴Additive Manufacturing Excellence Centre –, URTEMM, Kahramankazan, Ankara 06980, Turkey

- 16:00 **THz spectroscopy of biological molecules using nano-gap metamaterial and its role in breathalyzer-based COVID-19 prompt tests** **K.08.02**
 Rudrarup Sengupta, Heena Khand, Gabby Sarusi

Department of Photonics and Electro-Optics Engineering, School of Electrical and Computer Engineering, Ben-Gurion University of the Negev, Beer-Sheva, Israel

- 16:15 **A purview into highly sensitive magnetic SERS detection of hemozoin biomarker for rapid malaria diagnosis** **K.08.03**
 Sarjana Yadav, J.P. Singh
 Indian Institute of Technology, Delhi

- 16:30 **Impedimetric detection of SARS-CoV-2 antigens and antibodies using interdigitated gold nanowires.** **K.08.04**

Diana Isabel Sandoval Bojórquez¹, Ljiljana Janićević¹, Brenda Palestina Romero¹, Eduardo Sergio Oliveros Mata², Markus Laube¹, Anja Feldmann¹, Alexandra Kegler¹, Laura Drewitz¹, Ciara Fowley², Jens Pietzsch^{1,3}, Jürgen Fassbender², Torsten Tonn⁸, Michael Bachmann^{1,4-7}, Larisa Baraban¹.

¹ Institute of Radiopharmaceutical Cancer Research, Helmholtz-Zentrum Dresden-Rossendorf e. V. (HZDR), 01328 Dresden, Germany, ² Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf e.V. (HZDR), 01328 Dresden, Germany, ³ Technische Universität Dresden, School of Sciences, Faculty of Chemistry and Food Chemistry, 01307 Dresden, Germany, ⁴ Tumor Immunology, University Cancer Center (UCC), University Hospital Carl Gustav Carus Dresden, Technische Universität Dresden, 01307 Dresden, Germany, ⁵ National Center for Tumor Diseases (NCT), Dresden, Germany. Faculty of Medicine and University Hospital Carl Gustav Carus, Technische Universität Dresden, 01307 Dresden, Germany, ⁶ German Cancer Research Center (DKFZ), Heidelberg, Germany, ⁷ German Cancer Consortium (DKTK), Dresden, Germany, ⁸ Department for Experimental Transfusion Medicine, German Red Cross Blood Donation Service North-East, Dresden, Germany.

16:45 **Bacteriophages for nanotechnology, nanotechnology for bacteriophages** **K.08.05**

Jan Paczesny

Institute of Physical Chemistry, Polish Academy of Sciences, Kasprzaka 44/52, 01-224 Warsaw

17:00 **In situ TEM observation of gold biomineralization on helical viruses** **K.08.06**

C. Moreira da Silva ¹, D. Alloyeau ², T. Moravec ³, NT. Ha-Duong ¹

¹Université de Paris, ITODYS, CNRS, UMR 7086, 15 rue J-A de BaÅžf, F-75013 Paris, France ²Université de Paris, MPQ, CNRS, UMR 7262, 10 rue A. Domon et L. Duquet, F-75013 Paris, France ³Institute of Experimental Botany of the Czech Academy of Sciences, Prague, Czech Republic

17:15 **A lithography free, large-scale fabrication of Ag decorated Si nanowires SERS substrates using metal assisted chemical etching** **K.08.07**

Sathi Das,^a Kanchan Saxena ^b, and Dalip Singh Mehtaa

a Bio-photonics and Green Photonics Laboratory, Department of Physics, Indian Institute of Technology Delhi, Hauz-Khas, New Delhi-110016, India b Amity Institute of Renewable and Alternative Energy, Amity University, Uttar Pradesh, Sector-125 Noida-201303, India

Poster Session K : Yogendra Kumar Mishra, Dawid Janas, Rosaria Puglisi

- 17:30 **Ultrasonic spray coated Quasi-planar Heterojunction based organic solar cell** **K.P.1**
Sobia Waheed, Saurabh Pareek, and Supravat Karak

Organic & Hybrid Electronic Device Laboratory (OHEDL), Department for Energy Science and Engineering, Indian Institute of Technology Delhi, New Delhi 110016, India

- 17:30 **Influence of graphitic carbon nitride nanosheet as secondary dopant on the hole transport properties of PEDOT:PSS** **K.P.2**
Saurabh Pareek, Sobia Waheed, and Supravat Karak

Organic and Hybrid Electronic Device Laboratory, Department of Energy Science and Engineering, Indian Institute of Technology Delhi, New Delhi, India

- 17:30 **Synergistic Fenton Reaction by Copper-Iron Peroxide Nanoparticles for Enhanced Chemodynamic therapy** **K.P.3**
Sagang Koo^{1, 2}, Taeghwan Hyeon^{1, 2}

1. School of Chemical and Biological Engineering, and Institute of Chemical Processes, Seoul National University, Seoul 08826, Republic of Korea 2. Center for Nanoparticle Research, Institute for Basic Science (IBS), Seoul 08826, Republic of Korea

- 17:30 **Detection of buckling of flexible organic light-emitting diodes during bending test** **K.P.4**
*T. Kobayashi¹, T. Horiuchi², H. Furumoto³, Y. Utsumi⁴, A. Yamaguchi⁴, and I. C. Gruescu⁵

¹Department of Electronics and Controlling Engineering, National Institute of Technology, Tsuyama College, Okayama 708-8509, Japan ²Department of Electrical and Electronics System, National Institute of Technology, Tsuyama College, Okayama 708-8509, Japan ³Department of Industrial Engineering, Hiroshima Kokusai Gakuin University, Hiroshima 739-0321, Japan ⁴Laboratory of Advanced Science and Technology for Industry, University of Hyogo, 3-2-1 Kouto, Kamigori-cho, Ako-gun,

Hyogo 678-1297, Japan. 5Department GMP, Institute Univrsitaire de Technology A de Lille, BP 90179, 59653 Villeneuve dâ€™Ascq Cedex, France

17:30 **Preparation of Plasmonic Ag and Au Nanoparticle Interfaces for Photocurrent Enhancement in Si Solar Cells** **K.P.5**

Brahim AÄžssa1, Adnan Ali1, Rui N. Pereira2, Anirban Mitra3

1 Qatar Environment and Energy Research Institute, Hamad bin Khalifa University, Qatar Foundation, P.O. Box 34110, Doha, Qatar 2 Department of Physics and i3N - Institute for Nanostructures, Nanomodelling and Nanofabrication, University of Aveiro, 3810-193 Aveiro, Portugal 3 Department of Physics, Indian Institute of Technology Roorkee, Roorkee- 247667, Uttarakhand, India

17:30 **Development of an Opto-electro-thermal Model of optimized plasmon enhanced Schottky solar cell and beyond** **K.P.6**

Brahim AÄžssa1, Adnan Ali1, Rui N. Pereira2, Anirban Mitra3

1 Qatar Environment and Energy Research Institute, Hamad bin Khalifa University, Qatar Foundation, P.O. Box 34110, Doha, Qatar 2 Department of Physics and i3N - Institute for Nanostructures, Nanomodelling and Nanofabrication, University of Aveiro, 3810-193 Aveiro, Portugal 3 Department of Physics, Indian Institute of Technology Roorkee, Roorkee- 247667, Uttarakhand, India

17:30 **Forming Zero-TCR TiW Alloy Films by Reactive Sputtering** **K.P.7**

Yutaka Sakurai, Tsuyoshi Toshima

National Institute of Technology, Toyama College 13 Hongo, Toyama, 939-8045 Japan

17:30 **Spectroscopic Properties of Eu-doped SrTiO3 Ceramics Sintered from Sol-Gel Derived Powders** **K.P.8**

Cristina TIHON1, Catalina STANCIU1, George STANCIU1, Marin CERNEA2

1National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Atomistilor Street 409, Magurele 077125, Ilfov, ROMANIA

2National Institute of Materials Physics, Atomistilor 405 A Magurele Ilfov, ROMANIA

17:30 **Investigation of microstructure and spectroscopic properties of europium doped SrTiO3 ceramics prepared via sol-gel method** **K.P.9**

Catalina STANCIU¹, Cristina TIHON¹, George STANCIU¹, Stefania HAU¹, Marin CERNEA²

¹National Institute for Laser, Plasma and Radiation Physics, Laboratory of Solid-State Quantum Electronics, Atomistilor Street 409, Magurele 077125, Ilfov, ROMANIA

²National Institute of Materials Physics, Atomistilor 405 A Magurele Ilfov, ROMANIA

17:30 **Sintering and functionality of porous Cu₂O structures with fine Cu particle crystals** **K.P.10**

Hayate KINOSHITA, Shunya OGAWA, Yamato MORIOKA, Hirohisa TAGUCHI

Department of Electrical and Electronic Engineering Graduate School of Engineering,
Chukyo University 2-101, Yagoto-Honmachi, Showa Ward, Nagoya City, Aichi Pref.,
Japan 4668666

17:30 **Structural Properties of Carbon Nanowalls Synthesized with the Molybdenum Disulfide Interlayer** **K.P.11**

Chulsoo Kim*, Seokhun Kwon*, Hyunil Kang*, Kyuri Shin**, Junghyun Kim** and Wonseok Choi*

*Department of Electrical Engineering, Hanbat National University, Daejeon Korea,

**Department of Advanced Materials Science and Engineering, Hanbat National University, Daejeon Korea,

17:30 **Theoretical Modelling of Refractive Index Sensor Based on Porous Anodized Aluminium Oxide and Gold Nanoparticles** **K.P.12**

Ausrine Jurkeviciute, Juris Prikulis

Institute of Chemical Physics, University of Latvia, Jelgavas st. 1, LV-1004, Riga, Latvia

17:30 **Plasma modification of metal oxide nanowires for Zn-air batteries** **K.P.13**

Martin MÄLLER, He Li, Christian Schulze, Jan Benedikt

Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic, Institute of Experimental and Applied Physics, Experimental Plasma Physics, Kiel University, Germany, Institute of Experimental and Applied Physics, Experimental Plasma Physics, Kiel University, Germany, Institute of Experimental and Applied Physics, Experimental Plasma Physics, Kiel University, Germany

17:30 **Microstructure-dependent magnetic composite for high-performance microwave absorption in extended Ku-band** **K.P.14**

Anurima De, Bhanu Bhusan Khatua
Senior Research Fellow, Professor

17:30 **Cerium doping of the photoluminescent CsPbBr₃ thin films** **K.P.15**

D. Vorontsov, A. Fučáková, M. Ledinská, L. Landová, J. Valenta

D. Vorontsov, A. Fučáková, J. Valenta Charles University, Faculty of Mathematics and Physics, Department of Chemical Physics and Optics, Ke Karlovu 3, 12116 Prague 2, Czech Republic. M. Ledinská, L. Landová Institute of Physics of the Czech Academy of Sciences, Cukrovarnická 10, 16200 Prague, Czech Republic.

17:30 **Plasma-Activated Liquids as an Effective and Green Method for Surface Termination of Silicon Nanocrystals** **K.P.16**

F. Matějka [1,2], P. GaláčTM [1,2], J. Khun [1], K. Klížsová [2]

[1] Institute of Chemical Technology, Technická 3, Prague, Czech Republic [2] Institute of Physics, Czech Academy of Sciences, Cukrovarnická 10, Prague 6, Czech Republic

17:30 **High-Resolution Multi-Layered Serpentine Strain Gauges for Orthopaedic Implants** **K.P.17**

Alisha Bhatt 1 3, Wenqing Chen 1, Paul Brennan 2, Zheng Wu 4, Hazel Assender 4, Peter D. Lee 1 3, Manish K Tiwari 1

1 Department of Mechanical Engineering, University College, Torrington Place, London, WC1E 7JE, UK, 2 Department of Electronic and Electrical Engineering, University College, Torrington Place, London, WC1E 7JE, UK, 3 Research Complex at Harwell, Harwell Science & Innovation Campus, Didcot, OX11 0FA, UK, 4 Department of Materials, University of Oxford, Parks Road, Oxfordshire, OX1 3PH, UK

17:30 **Ultrasonic Spray Deposition of 1T-MoS₂ for In-Plane Micro-supercapacitors** **K.P.18**

Deniz Keskin, Caner Gorur, Mete Batuhan Durukan, Husnu Emrah Unalan

Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey

17:30 **Study of flammable silicon nanoparticles** **K.P.19**

J. Kopenec [1,2], P. GaláčTM [1,2], M. MäLler [2]

[1]University of Chemistry and Technology, Technická 3, Dejvice 166 28 Prague 6, Czech Republic [2] Institute of Physics, Czech Academy of Science, Cukrovarnická 112/10, 162 00 Prague 6, Czech Republic

17:30 **3D-Printed Hexagonal Boron Nitride/Polylactic Acid Nanocomposites** **K.P.20**

Mustafa Caner Gorur, Doga Doganay, Mete Batuhan Durukan, Husnu Emrah Unalan (Mustafa Caner Gorur 1), (Doga Doganay 1), (Mete Batuhan Durukan 1,2), and (Husnu Emrah Unalan 1,2) 1 - Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey 2 - Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey

17:30 **Resistive switching memory properties of Ag₅Te₃ nanoparticle-based thin films** **K.P.21**

Won-Yong Lee, Jaewon Jang

School of Electronic and Electrical Engineering, Kyungpook National University, Daegu 41566, Korea, School of Electronics Engineering, Kyungpook National University, Daegu 41566, Korea

17:30 **Improved Negative Bias Stability of Sol-gel Processed SnO₂, Thin-Film Transistor with Ultra-thin Al Layers** **K.P.22**

Taehun Lee, Jaewon Jang

School of Electronic and Electrical Engineering, Kyungpook National University, Daegu 41566, Korea

17:30 **Passivation of Ag-top electrode through Au deposition in Resistive Random Access Memory** **K.P.23**

HaeIn Kim, Jaewon Jang

School of Electronic and Electrical Engineering, Kyungpook National University, Daegu 41566, Korea

- 17:30 **Electrocatalysis of Oxygen Reduction Reaction for Electrodeposition of ZnO Thin Films** **K.P.24**

Tensho Nakamura, Hana Kudo, Kyota Uda, Yuki Tsuda, Yoshida Tsukasa
1,Yamagata University

- 17:30 **The effect of electrode substrate on electrodeposition of ZnO** **K.P.25**

Hana Kudo, Tensho Nakamura, Kyota Uda, Yuki Tsuda, Tsukasa Yoshida
Yamagata University

- 17:30 **Direct Ink Writing of 1T-MoS₂/Ag NW Inks for the Fabrication of Interdigitated Microsupercapacitors** **K.P.26**

Mete Batuhan Durukan ,Mustafa Caner Gorur, Gozde Ozturk , Onuralp Cakir, Deniz Keskin, Tufan Bolukbasi , Bayram Yildiz , Simge Cinar, Husnu Emrah Unalan
Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey, Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey,

- 17:30 **Utilization of Faradaic Electrodes for Improved Sensitivity of Capacitive Sensors** **K.P.27**

Mete Batuhan Durukan (1,2) , Melih Ogeday Cicek (1)* , Yusuf Tutel (1) , Burak Ulgut (3), Husnu Emrah Unalan (1,2) *presenting author (ogeday@metu.edu.tr)

1 - Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey 2 - Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey, 3 - Department of Chemistry, Bilkent University, Ankara 06800, Turkey.

- 17:30 **Dielectric Response of Novel LC Resonant Metamaterial Architecture using THz Impedance Spectroscopy for Bio-Sensing Applications** **K.P.28**
Heena Khand, Rudrarup Sengupta, Gabby Sarusi

Department of Photonics and Electro-Optics Engineering, School of Electrical and Computer Engineering, Ben-Gurion University of the Negev, Beer-Sheva, Israel

- 17:30 **The Role of Substrate Morphology on the Noble Nanoparticles Properties Produced by Laser-induced Deposition** **K.P.29**

N. E. Stankova, E. I. Iordanova, G. P. Yankov, N. N. Nedyalkov, N. Stefan, F.M. Miroiu, M.D. Dumitru, C. Hapenciuc, C.R. Luculescu, I.N. Mihailescu
Institute of Electronics, Bulgarian Academy of Sciences, 72 Tzarigradsko chaussee blvd., Sofia 1784, Bulgaria, Institute of Solid State Physics, Bulgarian Academy of Sciences, 72 Tzarigradsko Chaussee blvd., 1784 Sofia, Bulgaria, National Institute for Laser, Plasma and Radiation Physics INFLPR- Bucharest, Magurele Romania

- 17:30 **Morphology and composition of black titania nanotubes** **K.P.30**

Marya Ivanovskaya¹, Katsiaryna Chernyakova², Renata Karpicz², Evgeni Ovodok¹, Sergey Poznyak¹, Dzmitry Kotsikau³, Matej Micusik⁴
¹ Research Institute for Physical Chemical Problems of the Belarusian State University, Leningradskaya str. 14, 220006, Minsk, Belarus ² Center for Physical Science and Technology, Savanorių pr. 231, LT-02300 Vilnius, Lithuania ³ Belarusian State University, Nezavisimosti av. 4, 220030, Minsk, Belarus ⁴ Polymer Institute, Slovak Academy of Sciences, Bratislava, Slovakia

- 17:30 **Effect of sputtering power on the electrical properties of Al-doped ZnO thin films** **K.P.31**

K. Kacha¹, F. Djeflal¹, A. Bendjerad¹, H. Ferhati^{1,2}, A. Benhaya¹ and A. Saidi³
¹ LEA, Department of Electronics, University of Batna 2, Batna 05000, Algeria ² ISTA, University of Larbi Ben M'ehidi, Oum El Bouaghi, Algeria ³ Research Scientific and Technical Center on Physico-Chemical Analysis (CRAPC), Tipaza, Algeria.

- 17:30 **Quenching of fluorescence of doxorubicin by interaction with boron nitride nanoflakes** **K.P.32**

Olena Gnatyuk 1), Galina Dovbeshko 1), Andrej Dementjev 2), Renata Karpicz 2)

1) Institute of Physics of the National Academy of Sciences of Ukraine, Kiev, Ukraine, 2) Center for Physical Sciences and Technology, Vilnius, Lithuania

17:30 **Hybridization of CuSCN and ZnO / MB-EY Thin Film** **K.P.33**

Midori Suzuki¹, Tensho Nakamura¹, Kyota Uda¹, Yuki Tsuda², Lina Sun³, Tsukasa Yoshida¹

¹Graduate school of science and Engineering, Yamagata University, Yonezawa, Yamagata, Japan ²National Institute of Advanced Industrial Science and Technology, Osaka, Japan ³Innovation Center for Organic Electronics, Yamagata University, Yonezawa, Yamagata, Japan

17:30 **Crystallography and Functional Properties of Atomically Thin Aligned Nanowires** **K.P.34**

Kiran Bal, Reza Kashtiban, Jeremy Sloan

Department of Physics, University of Warwick, Coventry, CV4 7AL, UK

17:30 **Fabrication of 1D particle structures outside liquid environment using an electric and capillary interactions** **K.P.35**

Z. Rozynek (1,2), Y. Harkavyi (1), K. GóŁyŁski(3)

¹ Faculty of Physics, Adam Mickiewicz University, Uniwersytetu PoznaŁskiego 2, 61-614 PoznaŁ, Poland ² Department of Battery Technology, Institute for Energy Technology (IFE), Instituttveien 18, NO-2007 Kjeller, Norway ³ Institute of Physical Chemistry, Polish Academy of Sciences, Kasprzaka 44/52, 01-224 Warsaw, Poland

17:30 **Layer-engineered atomic-scale spalling of 2D vDW crystals** **K.P.36**

Ji-yun Moon, Seung-Il Kim, Jae-hyun Lee

Dept. of Energy system Reserch, Ajou University, Suwon, Gyeonggi-do 16499, Korea

17:30 **N-CQDs/MoS₂ (0D/2D) hybrid quantum heterostructure for solar cells and a broad range (UV-Vis-NIR) photodetection applications** **K.P.37**

Krishan Kumar, Davinder Kaur*

Functional Nanomaterials Research Lab, Department of Physics and Centre for Nanotechnology, Indian Institute of Technology Roorkee, Roorkee-247667, Uttarakhand, India *Corresponding Author: davinder.kaur@ph.iitr.ac.in, Tel.: 91-1332-285407, Fax.: 91-1332-273560

17:30 **Au nanoparticle covered ZnO nanostructure substrates for SERS application** **K.P.38**

Annamarija Trausa, Edgars Vanags, Ingars Lukoševičs, Krišjānis Ļiņš

University of Latvia, Institute of Solid State Physics, University of Latvia, Institute of Solid State Physics, University of Latvia, Institute of Solid State Physics, University of Latvia, Institute of Solid State Physics

17:30 **Optimization of transparent thin film TiO₂ nanotube arrays for perovskite solar cells** **K.P.39**

Mario Bohač, Vedran Kojić, Krunoslav Juraić, Thomas Rath, Andreja Gajović, Ruđer Bošković Institute, Zagreb, Croatia Graz University of Technology, Graz, Austria

17:30 **Magnetic anomalies in colloidal iron oxide nanoparticles fabricated via the co-precipitation method** **K.P.40**

Arkadiusz Ciesielski, Jacek Szczytko, Paweł Krysiński

Arkadiusz Ciesielski, Jacek Szczytko - University of Warsaw, Faculty of Physics, Pasteura 5, 02-093 Warsaw, Poland Paweł Krysiński - University of Warsaw, Department of Chemistry, Pasteura 1, 02-093 Warsaw, Poland

17:30 **Integration of ZnO Nanoparticles in Fibres for Toxic Gas Sensing Applications** **K.P.41**

Raisa Sadat Sharmin, Yogendra Kumar Mishra, Roana de Oliveira Hansen, Reza Abolhassani.

University of Southern Denmark

17:30 **MOVPE epitaxy of III-V nanowires** **K.P.42**

Ewa Dumiszewska, Jarosław Gaca, Iwona Jędrzejewska, Dariusz Czołak, Łukaszewicz - Institute of Microelectronics and Photonics, al. Lotników 32/46, 02-668 Warsaw, Poland

17:30 **MXene Decorated 3D Mesoporous Structure Based Pseudocapacitive Electrodes for Capacitive Deionization of Brackish Water** **K.P.43**

Tufan Bolukbasi¹, Oyku Cetin¹, Mete Batuhan Durukan^{1,2}, Melih Ogeday Cicek¹, Yaqoob Khan¹, and Husnu Emrah Unalan^{1,2}

1 - Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), 06800 Ankara, Turkey 2 - Energy Storage Materials and Devices Research Center (ENDAM), Middle East Technical University (METU), 06800 Ankara, Turkey

17:30 **Studies of optical anisotropy in very thin, nanometric thickness TiS₃ layers.** **K.P.44**

C. Jastrzębski¹, K. Lasocki¹, D. Jastrzębski², M. Pawłowski¹, J. Judek³, P. Zabierowski¹, D. Budiakivska¹, A. Krztoń¹, -Maziopa²

1Faculty of Physics, Warsaw University of Technology, Koszykowa 75, 00-662 Warsaw, Poland 2 Faculty of Chemistry, Warsaw University of Technology, Noakowskiego 3, 00-662 Warsaw, Poland 3 Faculty of Electronics and Information Technology, Warsaw University of Technology Nowowiejska 15/19, 00-665 Warsaw, Poland

17:30 **Growth of layered TiS₃ crystals by the CVT method for micromechanical exfoliation** **K.P.45**

Daniel Jastrzębski¹, Anna Krztoń¹, -Maziopa¹, Jarosław Judek², Cezariusz Jastrzębski³, Paweł Zabierowski³

1 Faculty of Chemistry, Warsaw University of Technology, Noakowskiego 3, 00-662 Warsaw, Poland, 2 Faculty of Electronics and Information Technology, Warsaw University of Technology Nowowiejska 15/19, 00-665 Warsaw, Poland, 3 Faculty of Physics, Warsaw University of Technology, Koszykowa 75, 00-662 Warsaw, Poland,

17:30 **Surface modified Silicon substrate combined with silver nanoparticles as efficient SERS platform** **K.P.46**

1. Haritha Joseph, 2.Sweta Rani, 3. Wenlong Cheng, 4. *Shobha Shukla Presenting Author - Haritha Joseph - haritha.joseph@monash.edu *Corresponding Author - sshukla@iitb.ac.in

1,2. IITB-Monash research academy, Indian Institute of Technology Bombay, Mumbai 400076, MH, India, 3. Department of Biological and Chemical Engineering, Faculty of Engineering, Monash University, Clayton 3800, Victoria, Australia, 4. Nanostructures Engineering and Modeling Laboratory, Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay, Mumbai 400076, MH, India

17:30 **Preparation and characterization of Carbon Nanotubes based hybrid nanomaterials for ink-jet printing** **K.P.47**
Alp Eren G  rol^{1,*}, Fulden Kayg  nok¹, Merve Ya  zcan¹

¹ ASELSAN Inc., 34906, Teknopark Istanbul, Istanbul, Turkey

WEDNESDAY, 21 SEPTMEBER 2022

Nanomaterials for Environment : Yogendra Kumar Mishra, Cenk Aktas, Dawid Janas, Rosaria Puglisi

13:00 **Molecularly imprinted photocatalysts for selective degradation of water contaminants** **K.00.1**
Maria Cantarella
CNR-IMM, Via S. Sofia 64, 95123 Catania, Italy

13:30 **ZnO nanostructures based photocatalytic civil engineering materials development for urban pollution remediation** **K.00.2**
Marie Le Pivert, Yamin Leprince-Wang

Univ Gustave Eiffel, IFSTTAR, COSYS-LISIS, F-77447 Marne-la-Vall  e, France, Univ Gustave Eiffel, CNRS, ESYCOM, F-77454 Marne-la-Vall  e, France

13:45 **Mesoporous zinc oxide supported silica-titania nanocomposite: Structural, optical, and photocatalytic activity** **K.00.3**
Adil Alshoaibia , Shumaila Islam

Department of Physics, College of Science, King Faisal University, Al-Hassa, P.O. Box 400, Hofuf 31982, Saudi Arabia

14:00 **High quality single crystal metal oxide nanoparticles synthesized by microwaves vaporization of metallic wires** **K.00.4**

Doina Craciun¹, Petronela Garoi¹, Marian Mogildea², George Mogildea², Bogdan S. Vasile³, Valentin Craciun¹, ⁴

¹National Institute for Laser, Plasma and Radiation Physic, Laser Department, 409 Atomistilor St., PO Box Magurele, Romania, ²Institute for Space Science, 077125, Magurele, Romania, ³University POLITEHNICA from Bucharest, Faculty of Applied Chemistry and Material Science, Department of Science and Engineering of Oxide Materials and Nanomaterials, Bucharest, Romania, ⁴Extreme Light Infrastructure for Nuclear Physics, ELI-NP, IFIN-HH, Magurele, Romania

- 14:15 **Post-heat treatment effect on the properties of indium doped zinc oxide nanocrystals produced by the sol-gel method** **K.00.5**
ENDRIS TAJU SEID, FRANCIS B. DEJENE

Physics Department Dire Dawa University, Physics Department Walter Sisulu University

- 14:30 **Reduced Singlet-Triplet Annihilation for Low Threshold Amplified Spontaneous Emission from Blue Polyfluorene Electroluminescent** **K.00.7**
Gopa Sardar
Department of Physics, Indian Institute of Technology Bombay, Maharashtra-400076, India

- 14:45 **Indium phosphide quantum dots derived photocatalyst: surface chemistry, optical properties and catalytic activity** **K.00.8**

F. Delpech ¹, K. Bakkouche ^{1,2}, F. Ferrari ¹, N. Katir ², A. El Kadib ², C. Nayral ¹

¹ LPCNO, Université de Toulouse, CNRS, INSA, UPS, 135 Avenue de Rangueil, 31077 Toulouse, France ² Euromed Research Center, Engineering Division, Euro-Med University of Fès (UEMF), Route de Meknes, Rond-point de Bensouda, 30070 Fès, Maroc

- 15:00 **Fast Light-Driven Motion of Polydopamine Nanomembranes** **K.00.9**

Thomas Vasileiadis [1,2], Tommaso Marchesi ^{Alvise} [2], Clara-Magdalena Saak [2,3], Mikolaj Pochylski [1], Sean Harvey [2], Christopher V. Synatschke [2], Jacek Gapinski [1], George Fytas [2], Ellen H. G. Backus [2,3], Tanja Weil [2], Bartłomiej Graczykowski [1,2].

[1] Faculty of Physics, Adam Mickiewicz University, Uniwersytetu Poznańskiego 2, 61-614 Poznań, Poland. [2] Max Planck Institute for Polymer Research, Ackermannweg 10, 55128 Mainz, Germany. [3] Department of Physical Chemistry, University of Vienna, Währinger Strasse 42, 1090 Vienna, Austria.

15:15 **Inducing Circular Dichroism into a Hybrid, One-Dimensional Perovskite using Chiral Amino Acids** **K.00.10**

Markus W. Heindl, Tim Kodalle, Natalie Fehn, Lennart K. Reb, Shangpu Liu, Constantin Harder, Maged Abdelsamie, Lissa Eyre, Ian D. Sharp, Stephan V. Roth, Peter MÄller-Buschbaum, Aras Kartouzian, Carolin M. Sutter-Fella, Felix Deschler
M. W. Heindl, S. Liu, L. Eyre, I. D. Sharp, F. Deschler, Walter Schottky Institut and Department of Physics, Technical University of Munich, Am Coulombwall 4, 85748 Garching, Germany, T. Kodalle, C. M. Sutter-Fella, Molecular Foundry, Lawrence Berkeley National Laboratory, 1 Cyclotron Rd., Berkeley, California 94720, United States, N. Fehn, A. Kartouzian, Catalysis Research Center and Chemistry Department, Technical University of Munich, Lichtenbergstraße 4, 85748 Garching, Germany, L. K. Reb, C. Harder, P. MÄller-Buschbaum, Lehrstuhl für Funktionelle Materialien, Physik-Department, Technische Universität München, James-Frank-Straße 1, 85748 Garching, Germany, C. Harder, S. V. Roth, Deutsches Elektronen-Synchrotron (DESY), Notkestr. 85, 22607 Hamburg, Germany, M. Abdelsamie, Materials Sciences Division, Lawrence Berkeley National Laboratory, 1 Cyclotron Rd., Berkeley, California 94720, United States, S. V. Roth, Department for Fiber and Polymer Technology, KTH Royal Institute of Technology, Teknikringen 56-58, 10044 Stockholm, Sweden, P. MÄller-Buschbaum, Heinz Maier-Leibnitz-Zentrum (MLZ), Technische Universität München, Lichtenbergstr. 1, 85748 Garching, Germany, F. Deschler, Institute of Physical Chemistry, Heidelberg University, Im Neuenheimer Feld, 69120 Heidelberg, Germany,

15:30 **Coffee Break**

Luminescent Materials : Sunny Sharma, Rosaria Puglisi, Yogendra Mishra
From Photon Anti-Bunching to Bunching in Nanodiamonds using Cathodoluminescence

16:00 **K.10.01**

S. Fiedler^{1,2*}, S. Morozov², D. Komisar², E.A. Ekimov^{3,4}, S. Kumar², C. Wolff², S.I. Bozhevolnyi^{2,5}, and N.A. Mortensen^{2,5}

1 Federal Institute for Materials Research and Testing, Biophotonics, Richard-Willstätter-Strasse 11, 12489 Berlin, Germany. 2Center for Nano Optics, University of Southern Denmark, Campusvej 55, 5230 Odense M, Denmark. 3 Institute for High Pressure Physics, Russian Academy of Sciences, Troitsk 108840, Moscow, Russia. 4Lebedev Physics Institute, Russian Academy of Sciences, Moscow 117924, Russia. 5 Danish Institute for Advanced Study, University of Southern Denmark, Campusvej 55, 5230 Odense M, Denmark.

16:30 **Metal-dielectric photonic crystal organic light emitting diodes** **K.10.02**

Matthew S. White[1][2] David Allemeier[2] Ekraj Dahal[2]
[1] University of Vermont, Department of Physics [2] University of Vermont, Materials Science Program

16:45 **Super bandgap illumination of H-terminated Silicon** **K.10.03**

S. Harilal, S. Sadhujan, A. Shalabny, A. Sweedan, M. Y. Bashouti
Ben-gurion University of the Negev

17:00 **Flexible and Solution-processable OLEDs based on novel conjugated polymers** **K.10.04**

Despoina Tselekidou¹, Kyparisis Papadopoulos¹, Vasileios Kyriazopoulos², Konstantinos C. Andrikopoulos³, Aikaterini K. Andreopoulou³, Joannis K. Kallitsis³, Argiris Laskarakis¹, Stergios Logothetidis¹, Maria Gioti¹
¹ Nanotechnology Lab LTFN, Department of Physics, Aristotle University of Thessaloniki, GR-54124 Thessaloniki, Greece ² Organic Electronic Technologies P.C. (OET), Antoni Tritsi 21B, GR-57001 Thessaloniki, Greece ³ Department of Chemistry, University of Patras, Caratheodory 1, University Campus, GR-26504 Patras, Greece

17:15 **Efficient colloidal quantum dot light-emitting diodes operating in the second near-infrared biological window** **K.10.05**

Abd. Rashid bin Mohd Yusoff

Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Gyeongbuk, Republic of Korea

17:30 **Femtosecond-laser Assisted Fabrication of Photoinitiator-free Fluorescent Photonic Crystals** **K.10.06**

Sweta Rani¹, Rahul Kumar Das^{2,3}, Arun Jaiswal², Gaurav Pratap Singh², Ajinkya Palwe², Sumit Saxena^{1,2,3}, Wenlong Cheng⁴, Shobha Shukla^{*1,2,3}
¹IITB-Monash Research Academy, Mumbai-400076, Maharashtra, India,
²Nanostructures Engineering and Modeling Laboratory, Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay, Mumbai, MH, India - 400076, ³Water Innovation Center: Technology Research & Education, Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay, Mumbai, MH, India - 400076, ⁴Department of Chemical Engineering, Monash University, Clayton 3800, Victoria, Australia

17:45 Heterogeneous III-V Nanowire Quantum Emitters on Silicon Photonic Circuits K.10.07

H. Jeong^{*}(1), A. Ajay(1), N. Mukhundhan(1), M. D'Alblinger(2), J. J. Finley(1), and G. Koblmüller(1)

(1) Walter Schottky Institute & Physics Department, Technische Universität München, Garching, Germany (2) Department of Chemistry, Ludwig-Maximilians-Universität München, Munich, Germany

18:00 Controlling the Synthesis of Plasmonic Magnesium Nanoparticles K.10.08

Thomas M. R. Wayman, Elizabeth R. Hopper, Christina Boukouvala, Jérémie Asselin, Vladimir Lomonosov, Emilie Ringe

Department of Materials Science and Metallurgy, University of Cambridge, Department of Earth Sciences, University of Cambridge

THURSDAY, 22 SEPTEMBER 2022

Layered Nanomaterials : Sunny Sharma, Dawid Janas, Yogendra Mishra

9:00 self-assembled monolayers on Ge as passivating and insulating layers K.11.01

Mohamed-Amine Guerboukha (a), Virginie Gadenne (a), Hela Mrezguia (b), Luca Giovanelli (b), Younal Ksari (b), Guillaume Monier (c), Victorien Jeux (d), Jean-Manuel Raimundo (e), Lionel Patrone (a)

(a) Aix Marseille Univ., Université de Toulon, CNRS, IM2NP UMR 7334, Yncréa Méditerranée, ISEN Toulon, Maison du Numérique et de l'Innovation, Place G. Pompidou, 83000 Toulon, France , (b) Aix Marseille Univ., Université de Toulon, CNRS, IM2NP UMR 7334, 13397, Marseille Cedex 20, France , (c) Univ Clermont Auvergne, CNRS, SIGMA Clermont, Inst Pascal, F-63000 Clermont Ferrand, France , (d) ESCOM Chimie, 1 allée du réseau JM Buckmaster, 60200 Compiègne, France , (e) CINaM UMR CNRS 7325, Aix-Marseille Université, 13288 Marseille cedex 09, France

9:15 **On the Complex Interplay between Charge Injection, Electron Transport, and Quantum Efficiency in Ambipolar Trilayer OLETs** **K.11.02**

Salvatore Moschetto, Emilia Benvenuti, Hakan Usta, Resul Ozdemir, Antonio Facchetti, Michele Muccini, Mario Prosa, Stefano Toffanin

Institute of Nanostructured Materials (ISMN) - National Research Council (CNR), Via P. Gobetti 101, Bologna 40129, Italy, Department of Nanotechnology Engineering, Abdullah Gül University, Kayseri 38080, Turkey, Department of Chemistry and the Materials Research Center, Northwestern University, 2145 Sheridan Road, Evanston, IL 60208-3113, USA

9:30 **Structural investigations of nanocrystalline VO₂/Si and VO₂/LSAT epilayers for thermochromic windows applications grown by PLD** **K.11.03**

Ayushi Rai¹, Cristian N. Mihailescu², Vidar Hansen¹, and Andreas Delimitis¹

¹ Department of Mechanical and Structural Engineering and Materials Science, University of Stavanger, PO box 8600, N-4036 Stavanger, Norway ² National Institute for Laser, Plasma and Radiation Physics, 409 Atomistilor Street, PO Box MG-36, 077125 Magurele, Romania

9:45 **Understanding multiple stages of germanium segregation in Ag and Au nanolayers – impact on optical and electrical properties** **K.11.04**

Arkadiusz Ciesielski, Jakub RogóŁa, Mihai C. Suster, RafaŁ, BoŁŁek, Mateusz Tokarczyk

University of Warsaw, Faculty of Physics, Pasteura 5, 02-093 Warsaw, Poland

10:00 **Laser-induced entanglement of liquid metal and metallic nanowire for the monolithically variable stretchable conductor** **K.11.05**

Chulmin Cho, Wooseop Shin, Minwoo Kim, Junhyuk Bang, Eunkyu Kim, Sukjoon Hong, Seung Hwan Ko

Applied Nano and Thermal Science Lab, Department of Mechanical Engineering, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, South Korea and Mechatronics Research, Samsung Electronics, 1, Samsungjeonja-ro, Hwaseong-si, Gyeonggi-do 18848, South Korea, Applied Nano and Thermal Science Lab, Department of Mechanical Engineering, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, South Korea, Applied Nano and Thermal Science Lab, Department of Mechanical Engineering, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, South Korea, Applied Nano and Thermal Science Lab, Department of Mechanical Engineering, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, South Korea, Department of Mechanical Engineering, The Cooper Union for the Advancement of Science and Art, New York, NY, 10003, USA, Optical Nanoprocessing Lab, Department of Mechanical Engineering, BK21 FOUR ERICA, ACE Center, Hanyang University, 55 Hanyangdaehak-ro, Sangnok-gu, Ansan15588, South Korea, Applied Nano and Thermal Science Lab, Department of Mechanical Engineering, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, South Korea and Institute of Advanced Machines and Design / Institute of Engineering Research, Seoul National University, Seoul 08826, South Korea

10:15 **From nanocubes to quasi-monocrystalline Au and Ag transparent electrodes** **K.11.06**

Anna Capitaine, David Grosso, Erik Garnett, Beniamino Sciacca

Aix-Marseille Univ, CINaM, Aix-Marseille Univ, IM2NP, AMOLF, CNRS, CINaM

10:30 **Coffee Break**

Energy and Electronic Materials : Susanta Roy, Dawid Janas, Yogendra Mishra

11:00 **Easily Transferable Polydopamine Films from the Air/Water Interface for Energy Applications** **K.12.01**

Jakub Szewczyk^{1,2}, Daniel Aguilar-Ferrer^{1,2}, Katarzyna Siuszdzak³, Kosma Szutkowski¹, Igor Iatsunskyi¹, Radosław Mrdłowski⁴, Mikhael Bachelary², Emerson Coy^{1*}

1. NanoBioMedical Centre, Adam Mickiewicz University, Wszechnicy Piastowskiej 3, 61-614, Poznań, Poland, 2. Institut Europeen des Membranes, IEM, UMR 5635, Univ Montpellier, ENSCM, Centre national de recherche scientifique (CNRS), Place Eugene Bataillon, 34095 Montpellier, France, 3. Centre of Laser and Plasma Engineering, The Szewalski Institute of Fluid-Flow Machinery, Fiszerka 14 Str., 80-231 Gdansk, Poland, 4. 5 Faculty of Chemistry, Adam Mickiewicz University, ul. Uniwersytet Poznański 8, 61-614 Poznań, Poland.

11:30 **Luminescent properties of ZnO-polymer core-shell nanoparticles** **K.12.02**

O. Chukova¹, T. Voitenko¹, I. Fesych¹, S.A. Nedilko¹, S.G. Nedilko¹, M. Andrulidaki², A. Papadopoulos², E. Stratakis²

1 - Taras Shevchenko National University of Kyiv, Ukraine, 2 - Institute of Electronic Structure & Laser, FORTH, Heraklion, Crete, Greece

11:45 **Demystification of the routes behind chemical deposition and growth of AZO films suitable for photovoltaics** **K.12.03**

Ivana Panaić¹, Vilko Mandić²,
Faculty of Chemical Engineering and Technology, Marulićev trg 20, 10000 Zagreb, Croatia

12:00 **Lunch Break**

13:15 **Towards novel photoswitches for use in organic and bioelectronics applications** **K.13.02**

Sultaan Yousaf, Dr Hugo Bronstein
University of Cambridge, Cambridge Display Technology

13:30 **Free-standing vertically aligned perovskite nanowire arrays with heterostructures** **K.13.03**

Zhaojun Zhang, Nils Lamers, Chen Sun, Crispin Hetherington, Ivan G. Scheblykin, Jesper Wallentin
Lund University, Sweden

13:45 **Chemical Beam Vapor Deposition grown nanocomposite ZrO₂/TiO₂ thin films for high-k dielectric applications** **K.13.04**

Rashmi Rani, William Maudez, Estelle Wagner, Md Kashif Shamim, Seema Sharma, Radheshyam Rai, Giacomo Benvenuti.

3D-OXIDES, 41 rue Henri FABRE, Saint Genis Pouilly 01630, France, Material Research Laboratory, Department of Physics, A N College, Boring Road, Patna-800013, India, Department of Physics, School of Physics and Materials Sciences, Shoolini University, Solan-173229, India, ABCD Technology, Route de Champ-Colin 12, CH-1260 Nyon, Switzerland.

14:00 **Design of complex active microstructures by melt electrowriting** **K.13.05**

Paula González^{1,2}, Ander Reizabal^{1,3}, Senentxu Lanceros-Mendez³, Paul Dalton¹
¹Phil and Penny Knight Campus for Accelerating Scientific Impact, University of Oregon, 1505 Franklin Boulevard, Eugene 97403, OR, USA ²Macromolecular Chemistry Research Group (LABQUIMAC), Dept. of Physical Chemistry. Faculty of Science and Technology, University of the Basque Country (UPV/EHU), Spain ³BCMaterials, Basque Center for Materials, Applications and Nanostructures, Bldg. Martina Casiano, UPV/EHU Science Park, Barrio Sarriena s/n, 48940 Leioa, Spain

14:15 **Study of Photoelectromagnetic effect to characterise carrier properties in semiconductors** **K.13.06**

Amritha A Raj, Sushobhan Avasthi, K.L. Narasimha
 Centre for Nanoscience & Engineering, Indian Institute of Science (IISc), Bangalore, INDIA

14:30 **Tetrapods based Smart Materials for Advanced Technologies** **K.14.01**

Reza Abolhassani, Fateme Mirsafii, Till Leižner, Horst-Günter Rubahn, Yogendra Kumar Mishra*
 University of Southern Denmark, Mads Clausen Institute, NanoSYD Alsion 2, DK-6400, Sønderborg, DENMARK

14:45 **Closing Remarks: Symposium K** **K.14.02**

Y. K. Mishra, D. Janas, R. Puglisi
 Symposium K Organizers



Symposium L

Sessions: Room 213| Main Building

Poster Session: Small Hall| Main Building

Nanomaterials:

Doping at the nanoscale: new challenges and advanced applications

Symposium Organizers: **Andrea CAPASSO** International Iberian Nanotechnology Laboratory (INL) Portugal

Enrico NAPOLITANI Università di Padova and CNR-IMM Italy

Jeffrey MCCALLUM The University of Melbourne Australia

Michele PEREGO CNR-IMM, Unit of Agrate Brianza Italy

Symposium L Program

MONDAY, 19 SEPTEMBER 2022

9:00 **Introduction - Symposium L**

Device Applications : Michele Perego

9:15 **High performance passivated contacts for Si PV based on engineered, doped nanopinholes through dielectric layers** **L.01.01**

Caroline Lima Salles (2), William Nemeth (1), Harvey Guthrey (1), Chun-Sheng Jiang (1), Sumit Agarwal (1,2), and Paul Stradins (1)

(1) National Renewable Energy Laboratory (2) Colorado School of Mines, Golden, CO, USA

9:45 **Comparative investigation of Er-doped Al₂O₃ thin films grown by different ALD approaches** **L.01.02**

L. Khomenkova^{1,2}, H. Mirabet³, C. Labbé⁴, J. Cardin⁴, X. Portier⁴, F. Gourbilleau⁴

1) V. Lashkaryov Institute of Semiconductor Physics, 45 Pr.Nauky, 03028 Kyiv, Ukraine, 2) National University of Kyiv-Mohyla Academy, 2 Skovorody str., 04070 Kyiv, Ukraine, 3) Department of Mathematics, Statistics, and Physics, College of Arts and Sciences, Qatar University, Doha, Qatar, 4) CIMAP, Normandie Univ, ENSICAEN, UNICAEN, CEA, CNRS, 6 Boulevard Maréchal Juin, 14050 Caen Cedex 4, France

10:00 **3D to 2D, Traditional and New Doping Challenges at the Nanoscale** **L.01.03**

Ray Duffy,¹ Nikolay Petkov,²

1 Tyndall National Institute, University College Cork, Lee Maltings, Cork T12 R5CP, Ireland. 2 Munster Technological University, Bishopstown, Cork T12 P928, Ireland.

10:30 **Coffee Break**

Monolayer Doping : Enrico Napolitani

11:00 **Atomically Thin Delta Doping by Flash Lamp Annealing** **L.02.01**

Yaping Dan, Shannan Chang

11:30 **From Controlled to Precision Polymers for Doping Applications** **L.02.02**

Michele Laus

Dipartimento di Scienze e Innovazione Tecnologica (DISIT),
Università del Piemonte Orientale - A. AvogadroTM, Viale
T. Michel 11, 15121 Alessandria, Italy, INSTM, UdR Alessandria.

12:00 **Ex situ Doping of ultra-shallow silicon on insulator substrates by phosphorus end-terminated polymers** **L.02.03**

Andrea Pulici (a,b), Stefano Kuschlan (a,c), Gabriele Seguini (a),
Riccardo Chiarcos (c), Michele Laus (c), Michele Perego (a)

(a) CNR-IMM, Unit of Agrate Brianza, Via C. Olivetti 2, I-20864 Agrate
Brianza, Italy. (b) Università degli Studi di Milano, Via Celoria 16, I-
20133 Milano, Italy (c) Università del Piemonte Orientale - A.
AvogadroTM, Viale T. Michel 11,

12:15 **Phosphorus precursors reactivity versus hydrogenated Ge surface: towards a reliable self-limited monolayer doping** **L.02.04**

Francesco Sgarbossa (a,b)*, Alberto Levarato (a), Sara Maria Carturan
(a,b), Gian Andrea Rizzi (c), Cristina Tubaro (c), Gianluca Ciatto (d),
Federica Bondino (e), Igor Păs (e,f), Enrico Napolitani (a,b), Davide De
Salvador (a,b)

a) Dipartimento di Fisica e Astronomia, Università degli Studi di
Padova, via Marzolo n.8, 35131 Padova, Italy b) Laboratori Nazionali
di Legnaro, Istituto Nazionale di Fisica Nucleare, viale
dell'Università n.2, 35020 Legnaro, PD, Italy c) Dipartimento di
Scienze Chimiche, Università degli Studi di Padova, via Marzolo n.1,
35131 Padova, Italy d) Synchrotron SOLEIL, L'Orme des
Merisiers, Saint-Aubin, BP48, 91192 Gif-sur-Yvette Cedex, France e)
IOM-CNR Laboratorio TASC, S.S. 14 km 163.5, 34149 Basovizza,
Trieste, Italy f) Elettra - Sincrotrone Trieste S.C.p.A., S.S. 14 km
163.5, 34149 Basovizza, Trieste, Italy *) presenting author

12:30 **Lunch Break**

Advanced Growth and Characterization : Enrico Napolitani

14:00	Advanced in situ doping strategies for group-IV semiconductors: new basic physics and implications for device modeling	L.03.01
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José Menéndez, John Kouvetakis
 Department of Physics, Arizona State University, Tempe, AZ 85287-1504, USA School of Molecular Sciences, Arizona State University, Tempe, AZ 85287-1604, USA

14:30	Optical and Magneto-Optical Properties of Donor-Bound Excitons in Vacancy-Engineered Colloidal Nanocrystals	L.03.02
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Francesco Carulli*, Valerio Pinchetti, Matteo L. Zaffalon, Andrea Camellini, Silvia Rotta Loria, Fabrizio Moro, Marco Fanciulli, Margherita Zavelani-Rossi, Francesco Meinardi, Scott A. Crooker, and Sergio Brovelli

Francesco Carulli, Matteo L. Zaffalon, Fabrizio Moro, Marco Fanciulli, Francesco Meinardi, Sergio Brovelli: Dipartimento di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, 20125 Milano, Italy. Andrea Camellini, Silvia Rotta Loria, Margherita Zavelani-Rossi: Dipartimento di Energia, Politecnico di Milano, IT-20133 Milano, Italy. Valerio Pinchetti, Scott A. Crooker: Los Alamos National Laboratory, Los Alamos, New Mexico 87545, United States.

14:45	Three-dimensional dopant profiling by Atom Probe Tomography	L.03.03
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Lorenzo Rigutti
 Normandie Univ., UNIROUEN, INSA Rouen, CNRS, Groupe de Physique des Matériaux, 76000 Rouen, France

15:15	Secondary ion mass spectrometry quantification of boron distribution in silicon nanowires	L.03.04
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Paweł, Piotr Michałowski, Jonas Möller, Chiara Rossi, Alexander Burenkov, Eberhard Bär, Guilhem Larrieu, Peter Pichler

Paweł, Piotr Michałowski, - Łukasiewicz Research Network "Institute of Microelectronics and Photonics, Warsaw, Poland Jonas MÅller, Guilhem Larrieu - LAAS, CNRS and Universit  de Toulouse, Toulouse, France Chiara Rossi, Alexander Burenkov, Eberhard B r, Peter Pichler - Fraunhofer Institute for Integrated Systems and Device Technology, Erlangen, Germany

15:30

Coffe Break

Laser Processing : Jeffrey McCallum

16:00

Atomistic Simulation of Ultra-Fast Annealing Processes

L.04.01

Antonino La Magna 1), G. Calogero1), I. Deretzis 1), G. Fisicaro 1), D. Raciti 1), D. Ricciarelli 1), I. Bejenari 2), A. Burenkov 2), P. Pichler 2), K. Huet 3), P. Acosta-Alba 4), S. Kerdiles 4), R. Daubriac 5), R. Demoulin 5), F. Cristiano 5).

1) Consiglio Nazionale delle Ricerche Istituto per la Microelettronica e Microsistemi, Zona Industriale VIII Strada 5 Catania, Italy, 2) Fraunhofer Institute for Integrated Systems and Device Technology IISB Schottkystrasse 10, 91058 Erlangen, Germany, 3) Laser Systems & Solutions of Europe (LASSE), Gennevilliers, France, 4) Universit  Grenoble Alpes, CEA-LETI, Grenoble, France, 5) LAAS, CNRS, Universit  de Toulouse, Toulouse, France.

16:30

Ex-situ incorporation of sputtered Sn in Ge by pulsed laser melting: a new approach to fabricate GeSn alloys with substitutional fraction exceeding 10%

L.04.02

Enrico Di Russo(1,2,3), Francesco Sgarbossa(1,2), Pierpaolo Ranieri(1), Samba Ndiaye(4), S bastien Duguay(4), Fran ois Vurpillot(4), Lorenzo Rigutti(4), Jean-Luc Rouvi re(5), Vittorio Morandi(3), Davide De Salvador(1,2), Enrico Napolitani(1,2,6).

(1) Dipartimento di Fisica e Astronomia, Università degli Studi di Padova, Via Marzolo 8, 35131 Padova, Italy, (2) INFN-LNL, viale dell'Università 2, 35020, Legnaro, Padova, Italy, (3) CNR-IMM, Via Gobetti 101, Bologna, 40129, Italy, (4) Normandie Univ., UNIROUEN, INSA Rouen, CNRS, Groupe de Physique des Matériaux, 76000 Rouen, France, (5) Univ. Grenoble Alpes, CEA, IRIG-MEM, 38000 Grenoble, France, (6) CNR-IMM, Via S. Sofia 64, 95123 Catania, Italy.

16:45

Doping of silicon by phosphorus end-terminated polymers: shallow junction formation by laser annealing

L.04.03

Gianluca Barin (a,b), Riccardo Chiarcos (c), Michele Laus (c), Enrico Napolitani (d), Michele Perego (a)
(a) CNR-IMM, Unit of Agrate Brianza, Via C. Olivetti 2, I-20864 Agrate Brianza, Italy. (b) Università degli Studi di Milano, Via Celoria 16, I-20133 Milano, Italy (c) Università del Piemonte Orientale - A. Avogadro, Viale T. Michel 11, (d) Università di Padova and CNR-IMM, Via Marzolo 8, I-35131 Padova, Italy

17:00

Ex-situ n-type heavy doping of Ge_{1-x}Sn_x epilayers by surface Sb deposition and pulsed laser melting

L.04.04

Daris Fontana (1), Francesco Sgarbossa (1,2)*, Ruggero Milazzo (1), Enrico Di Russo (1,2,3), Emmanuele Galluccio (4), Davide De Salvador (1,2), Ray Duffy (4), and Enrico Napolitani (1,2,5).

1) Università degli Studi di Padova, Dipartimento di Fisica e Astronomia, via Marzolo 8, 35131 Padova, Italia. 2) Istituto Nazionale di Fisica Nucleare, Laboratori Nazionali di Legnaro, viale dell'Università 2, 35020 Legnaro (PD), Italia. 3) CNR-IMM, Via Gobetti 101, 40129 Bologna, Italy. 4) Tyndall National Institute, University College Cork, Lee Maltings, Cork T12 R5CP, Ireland. 5) CNR-IMM, Via S. Sofia 64, 95123 Catania, Italy. *) presenting author

17:15

Pulsed Nanosecond Laser Annealing of intrinsic and phosphorous implanted GeSn layers

L.04.05

M. Frauenrath, P. Acosta-Alba, N. Gauthier, M. Veillerot, N. Bernier and J.M. Hartmann
University Grenoble Alpes and CEA-LETI, Grenoble, France

- 17:30 **Hydrogen sensing performance of Pd nanogap sensor on a polydimethylsiloxane substrate at a wide range of operating temperatures** **L.P.1**
 Se-Young Park, Hyun-Sook Lee, and Wooyoung Lee*
 Department of Materials Science and Engineering, Yonsei University,
 262 Seongsanno, Seodaemun-gu, Seoul, 03722, Korea
 * Corresponding author: wooyoung@yonsei.ac.kr
- 17:30 **Nanocages to Vesicular self-assembled Quaternary structure of bispidine induced β -strand** **L.P.2**
 Hanuman Singh, Akshay Chenna, Upanshu Gangwar, Gaurav Goel, V. Haridas.
 Department of Chemistry, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, India-110016, E-mail:
 cyz178493@chemistry.iitd.ac.in. Department of Chemical Engineering, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, India-110016.
- 17:30 **Enhanced Thermoelectric Power Factor in Carrier-Type-Controlled Platinum Diselenide Nanosheets by Molecular Charge Transfer Doping** **L.P.11**
 Seonhye Youn, Jeongmin Kim, Hongjae Moon, and Wooyoung Lee

 Department of Materials Science and Engineering, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of Korea, Division of Nanotechnology, DGIST, 333 Techno Jungang-daero, Hyeonpung-eup, Dalseong-gun, Daegu 42988, Republic of Korea, Department of Materials Science and Engineering, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of Korea, Department of Materials Science and Engineering, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of Korea
- 17:30 **Modification of Aluminum Powder Surface with Nanostructured Porous Layers** **L.P.3**
 Haneul Park, Sunghan Kim, Mingu Han
 Agency for Defense Development
- 17:30 **Organic Solvent Sensor using Pseudopeptidic Bottlebrush Polymer Dispersed Liquid Crystal** **L.P.4**
 Asha Kumari,^a Hanuman Singh,^b Sameer Dhawan,^b V. Haridas^{*b} and Aloka Sinha^{*a}

aDepartment of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, India-110016. bDepartment of Chemistry, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, India-110016.

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| 17:30 | <p>Synthesis of Ce-Doped ZnO Nanorods and analysis of its gas sensing characteristics in an indigenous flowmetric gas sensing chamb</p> <p>K Govardhan*, S Muthuraja & T Malathy
 K Govardhan, School of Electronics Engineering, Vellore Institute of Technology, Vellore, Tamil Nadu, India. S Muthuraja, School of Electronics Engineering, Vellore Institute of Technology, Vellore, Tamil Nadu, India. T Malathy, School of Electronics Engineering, Vellore Institute of Technology, Vellore, Tamil Nadu, India.</p> | L.P.5 |
| 17:30 | <p>Solution-processable red phosphorescent OLEDs based on different Ir(dmpq)2(acac) doped small molecules as emitting layer</p> <p>Despoina Tselekidou¹, Kyparisis Papadopoulos¹, Vasileios Kyriazopoulos², Spyros Kassavetis¹, and Maria Gioti¹
 ¹ Nanotechnology Lab LTFN, Department of Physics, Aristotle University of Thessaloniki, GR-54124 Thessaloniki, Greece ² Organic Electronic Technologies P.C. (OET), Antoni Tritsi 21B, GR-57001 Thessaloniki, Greece</p> | L.P.6 |
| 17:30 | <p>Molecular Beam Epitaxy Growth of Transition Metal Dichalcogenide (Mo,Mn)Se₂ on 2D and polycrystalline substrates</p> <p>J. Kucharek,* R. Bořek, W. Pacuski
 Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warszawa, Poland</p> | L.P.7 |
| 17:30 | <p>II-VI Semiconductor Nanocrystal Doping with Manganese Ions</p> <p>I. D. Stolyarchuk, O. O. Danâ€™kiv, I. V. Hadzaman, A.I. Stolyarchuk, O. V. Kuzyk
 Department of Physics, Drohobych Ivan Franko State Pedagogical University, 24 I.Franko str., 82100 Drohobych, Ukraine</p> | L.P.9 |
| 17:30 | <p>Hydrothermal Synthesis of tunable Ceria nanosturctured graphene oxide and its biocompatibility study</p> | L.P.10 |

Chinmaya Mahapatra
 Department of Biotechnology, National Institute of Technology (NIT)
 GE Road, Raipur-492010 (Chhattisgarh), INDIA

17:30 **Depletion Layer Engineering in Core-shell Metal Oxide Nanocrystals** **L.P.12**

Nicola Curreli [1], Michele Ghini [1], Matteo B. Lodi [2], Nicol  Petrini [1], Alessandro Fanti [2], Ilka Kriegel [1]
 1 Functional Nanosystems, Istituto Italiano di Tecnologia (IIT), via Morego 30, 16163 Genova, Italy, 2 Department of Electric and Electronic Engineering (DIEE), University of Cagliari, Piazza D'Armi, 09123 Cagliari, Italy.

WEDNESDAY, 21 SEPTMEBER 2022

Quantum Technology : Jeffrey McCallum

16:00 **Spin qubits based on single heavy dopants in silicon nanostructures** **L.05.01**

Antonio J. Sousa de Almeida Floris A. Zwanenburg
 NanoElectronics Group, MESA+ Institute for Nanotechnology,
 University of Twente, the Netherlands

16:30 **The Application of Ion Beams for Solid State Quantum Technologies** **L.05.02**

R.P.Webb, N.Cassidy, P.Blenkinsopp, I.Brown, T.Adams, B.Murdin,
 E.Schneider, D.Cox and J.England
 Surrey Ion Beam Centre, University of Surrey, Guildford, GU2 7XH, UK
 Ionoptika Ltd., B6 Millbrook Close, Chandler s Ford, Hampshire,
 SO534BZ, UK Advanced Technology Institute, University of Surrey,
 Guildford, GU2 7XH, UK

17:00 **Periodic array of highly doped nanodots in silicon by block copolymer lithography and ion implantation** **L.05.03**

(1)(2) Stefano Kuschlan, (2) Michele Perego, (3) Francesc P rez-Murano, (3) Jordi Llobet, (3) Marta Fernandez-Regulez, (1) Michele Laus, (1) Valentina Gianotti, (2) Graziella Tallarida

(1) Department of Science and Technological Innovation (DiSIT),
 Universit  del Piemonte Orientale, (2) IMM-CNR Agrate Unit, (3)
 Instituto de Microelect nica de Barcelona

17:15

**Doping of silicon by phosphorus end-terminated polymers:
surface preparation and activation of dopants**

L.05.04

Gianluca Barin (a,b), Gabriele Seguini (a), Diego Antonioli (b), Michele Laus (b), Michele Perego (a)

(a) CNR-IMM, Unit of Agrate Brianza, Via C. Olivetti 2, I-20864 Agrate Brianza, Italy. (b) Università degli Studi di Milano, Via Celoria 16, I-20133 Milano, Italy (c) Università del Piemonte Orientale $\hat{\infty}$ $\hat{\infty}$ A. Avogadro $\hat{\infty}$ $\hat{\infty}$, Viale T. Michel 11,

THURSDAY, 22 SEPTEMBER 2022

2D Materials : Andrea Capasso

9:00

Doping graphene with substitutional oxygen

L.06.01

D. M A Mackenzie¹, M Galbiati¹, X D de Cerio², I Y Sahalianov³, T M Radchenko⁴, J Sun¹, D PeÅ±a⁵, L Gammelgaard¹, B S Jessen¹, J D Thomsen¹, P BÅ_ggild¹, A Garcia-Lekue^{2,6}, L Camilli⁷ and J M Caridad⁸

¹ Department of Physics and Center for Nanostructured Graphene, Technical University of Denmark, 2800 Kongens Lyngby, Denmark ² Donostia International Physics Center (DIPC), Donostia-San Sebastian 20018, Spain ³ Laboratory of Organic Electronics, ITN, LinkÅping University, 60174 NorrkÅping, Sweden ⁴ Department of Metallic State Theory, G.V. Kurdyumov Institute for Metal Physics of the NAS of Ukraine UA-03142 Kyiv, Ukraine ⁵ Centro Singular de Investigación en Química BiolÅxica e Materiais Moleculares (CiQUS), Universidad de Santiago de Compostela, 15705 Santiago de Compostela, Spain ⁶ Ikerbasque, Basque Foundation for Science, Bilbao 48013, Spain ⁷ Department of Physics, University of Rome $\hat{\infty}$ Tor Vergata $\hat{\infty}$, 00133 Rome, Italy ⁸ Department of Applied Physics and USAL NanoLab, University of Salamanca, 37008 Salamanca, Spain

9:30

Surface transfer doping of diamond by MoO₃ and V₂O₅ metal oxides: a combined experimental and simulation study

L.06.02

Dr David Moran and Dr Vihar Georgiev
University of Glasgow

9:45

Boron nitride nanomaterials and their applications

L.06.03

Dr Srikanth Mateti
Institute for Frontier Materials, Deakin University, Geelong, 3216, Victoria, Australia

10:00	Fabrication of crystalline MoS2 by sputter deposition and pulsed laser annealing. Enrico Di Russo(1,2,3), Francesco Sgarbossa(1,2), Alessandro Tonon(1), Arianna Mischianti(1), Emma Coleman(4), Davide De Salvador(1,2), Ray Duffy(4), Enrico Napolitani(1,2,5). (1) Dipartimento di Fisica e Astronomia, Università degli Studi di Padova, Via Marzolo 8, 35131 Padova, Italy, (2) INFN-LNL, viale dell'Università 2, 35020, Legnaro, Padova, Italy, (3) CNR-IMM, Via Gobetti 101, Bologna, 40129, Italy, (4) Nanoelectronic Materials and Devices Group, Tyndall National Institute, University College Cork, Cork T12 R5CP, Ireland, (5) CNR-IMM, Via S. Sofia 64, 95123 Catania, Italy.	L.06.04
10:30	Coffee Break	
Nanomaterials : Michele Perego		
11:00	Encapsulation of Functional Halides-Novel Structures and the Role of the Host Material Reza J Kashtiban(a), Christopher E. Patrick(c), Quentin Ramasse(d,e), Richard I. Walton(b), Maria G Burdanova(a), James Lloyd-Hughes(a), Andriy Vasylenko(a,f), David Quigley(a), Michael Staniforth(b), Yongjia Zheng(g), Rong Xiang(g), Shohei Chiashi(g), Jack Woolley(b), Emily Sakamoto-Rablah(b), Xue Xia(a), Matthew Broome(a), Anton Anisimov(h), Esko Kauppinen(i), Shigeo Maruyama(g), Jeremy Sloan(a) a)Department of Physics, University of Warwick, Coventry, CV4 7AL UK b)Department of Chemistry, University of Warwick, Coventry, CV4 7AL UK c)Department of Materials, University of Oxford, Parks Road, Oxford, OX1 3PH UK d)SuperSTEM Laboratory, SciTech Daresbury Campus, Daresbury, WA44AD UK e)School of Chemical and Process Engineering, University of Leeds, Leeds LS2 9JT, UK f)Department of Chemistry, University of Liverpool, Crown Street, Liverpool, L69 7ZD UK g)Department of Mechanical Engineering, The University of Tokyo, Tokyo 113-8656, Japan h)Canatu Ltd., Helsinki FI00390, Finland i)Department of Applied Physics, Aalto University School of Science, Espoo 15100, FI-00076 Aalto, Finland.	L.07.01
11:15	Al and Ga co-doping of ZnO nanowires grown by chemical bath deposition: investigation of extra metal salt use	L.07.02

Adrien Baillard 1, Estelle Appert 1, Matthieu Weber 1, Văronique Jacob 2, Odette Chaix-Pluchery 1, and Vincent Consonni 1

1Université Grenoble Alpes, CNRS, Grenoble INP, LMGP, F-38000 Grenoble, France, 2 Université Grenoble Alpes, CNRS, IRD, Grenoble INP, IGE, F-38000 Grenoble, France

11:30 **Spectroscopic properties evolution of single-walled carbon nanotubes induced by atomic HgTe NW filling** **L.07.03**

Ziyi Hu, Jeremy Sloan, James Lloyd-Hughes
University of Warwick

11:45 **Interlevel absorption of electromagnetic wave in the quantum dot with acceptor impurity in the electric field** **L.07.04**

Kh. O. Metsan, R. Ya. Leshko, I.V. Bilynskyi
Drohobych Ivan Franko State Pedagogical University, 3 Stryiska Str.,
82100 Drohobych, Ukraine.

12:00 **Enhancing the properties of carbon nanotubes by structure control and doping** **L.07.05**

Dawid Janas
Silesian University of Technology, Department of Organic Chemistry,
Bioorganic Chemistry and Biotechnology, Krzywoustego 4, 44-100 Gliwice

12:15 **Enhanced solubility and thermoelectric performance in Al-doped higher manganese silicide** **L.07.06**

Nagendra S. Chauhan, Ichiro Ono, Kei Hayashi, Yuzuru Miyazaki

Department of Applied Physics, Graduate School of Engineering,
Tohoku University, Sendai, Miyagi, Japan - 980-8579



Symposium M

Sessions: Room 226| Main Building

Poster Session: Small Hall| Main Building

Nanomaterials:

Defect-induced effects in nanomaterials

Symposium Organizers: **Anatoli POPOV** University of Latvia

Halyna KLYM Lviv Polytechnic National University Ukraine

Mikhail BRIK University of Tartu Estonia

Nikolai A. SOBOLEV Universidade de Aveiro Portugal

Symposium M Program

TUESDAY, 20 SEPTEMBER 2022

Session 1 : NN

- 9:00 **X-ray absorption spectroscopy as a powerful tool for nanoscience** **M.01.01**
Andris Anspoks, Aleksejs Kuzmins
Institute of Solid State Physics, University of Latvia
- 9:30 **Engineering defect interactions in filamentary valence-change memristive devices towards neuromorphic computing** **M.01.02**
Alff, L. *(1), Kaiser, N. (1), Major, M. (1), McKenna, K. P. (2), Molina-Luna, L. (1), Nasiou, D. (1), Piros, E. (1), Vogel, T. (1), Winkler, R. (1), Zintler, A. (1)

(1) Institute of Materials Science, Technische Universität Darmstadt, 64287 Darmstadt, Germany (2) Department of Physics, The University of York, York YO10 5DD, United Kingdom
- 10:00 **Impact of structural defects on the electrical and optical properties in Indium Phosphide (InP) material** **M.01.03**

Christian Dam Vedel^{1,2}, Søren Smidstrup², Vihar Georgiev¹

1- Device Modelling Group, School of Engineering, University of Glasgow, Glasgow G12 8QQ, United Kingdom 2 - Synopsys Denmark ApS, Fruebjergvej 3, 2100 Copenhagen, Denmark
- 10:15 **Investigation of graphene on SiC under neutron irradiation by Raman Spectroscopy** **M.01.04**
Jakub Jagiello, Artur Dobrowolski, Tymoteusz Ciuk

Lukasiewicz Research Network ? Institute of Microelectronics and Photonics, Aleja Lotnikow 36/46 02-668
- 10:30 **Coffee break**

Session 2 : NN

- 11:00 **Impacts of Interfaces and Element Deficiency on Catalytic Activities: Cases of Bi-based semiconductor systems** **M.02.01**
- Taohai Li, Wei Cao, Harishchandra Singh, Marko Huttula, Feng Li, Meng Zhang
- Nano and Molecular Systems Research Unit, University of Oulu, P.O. Box 3000, FI-90014, Oulu, Finland & College of Chemistry, Key Lab of Environment Friendly Chemistry and Application in Ministry of Education, Xiangtan University, Xiangtan 411105, China, Nano and Molecular Systems Research Unit, University of Oulu, P.O. Box 3000, FI-90014, Oulu, Finland, Nano and Molecular Systems Research Unit, University of Oulu, P.O. Box 3000, FI-90014, Oulu, Finland, Nano and Molecular Systems Research Unit, University of Oulu, P.O. Box 3000, FI-90014, Oulu, Finland, Key Lab of Environment Friendly Chemistry and Application in Ministry of Education, Xiangtan University, Xiangtan 411105, China & Nano and Molecular Systems Research Unit, University of Oulu, P.O. Box 3000, FI-90014, Oulu, Finland Department of Physics, East China University of Science and Technology, Shanghai 200237, China
- 11:30 **The angular overlap approach to ligand field theory - An almost forgotten model with chemical intuition** **M.02.02**
- Markus Suta, Fanica Cimpoesu, Werner Urland
- M. Suta: Inorganic Photoactive Materials, Institute of Inorganic Chemistry, Heinrich Heine University Düsseldorf, Universitätsstr. 1, 40225 Düsseldorf, Germany, F. Cimpoesu: Institute of Physical Chemistry, Splaiul Independentei 202, Bucharest 060021, Romania, W. Urland: Private Institute of Theoretical Chemical Physics, Via Dr. A. Sciaroni 2, CH-6600 Muralto, Switzerland
- 12:00 **First-principles calculations of F-centers and iridium impurities in gallium oxide polymorphs.** **M.02.03**
- A. Zachinskis, D. Bocharov, S. Piskunov, A. Platonenko, J. Purans.
- Institute of Solid State Physics, University of Latvia, Riga, Kengaraga 8, LV-1063

12:15	Tailoring of room temperature ferromagnetism in GaN thin films by ion irradiation: Experimental and First principle-based study Sharmistha Dey, Santanu Ghosh, Pankaj Srivastava Nanotech Laboratory, Department of Physics, Indian Institute of Technology Delhi, New Delhi, India	M.02.04
12:30	Lunch	
14:00	Ion implantation and defect engineering in wide bandgap semiconductor nanostructures K. Lorenz [1,2,3], D. R. Pereira [1,2,3], D. M. Esteves [1,2,3], D. Verheij [1,2,3], D. Nd. Faye [1,2,3], M. Peres [1,2,3], L. C. Alves [1,4], E. Alves [1,3], S. Cardoso [1,2], J. P. S. Cardoso [5], M. R. Correia [5], N. Ben Sedrine [5], T. Monteiro [5], R. Vermeersch [6], B. Daudin [6] [1] Instituto Superior T�cnico (IST), University of Lisbon, Portugal, [2] INESC MN, Lisbon, Portugal, [3] IPFN, IST, University of Lisbon, Portugal, [4] C2TN, IST, University of Lisbon, Portugal, [5] Departamento de F�sica & i3N, Universidade de Aveiro, Portugal, [6] Univ. Grenoble Alpes, CEA, IRI-PHELIQS, NPSC, Grenoble, France	M.03.01
14:30	High pressure study of yellow luminescence in Be- and C-doped GaN - experimental and theoretical analysis Agata Kaminska Cardinal Stefan Wyszyński University, Faculty of Mathematics and Natural Sciences. School of Exact Sciences, Dewajtis 5, 01-815 Warsaw, Poland, Institute of Physics, Polish Academy of Sciences, Aleja Lotników 32/46, 02-668 Warsaw, Poland, Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland,	M.03.02
15:00	Calculation of thermoluminescence kinetic parameters of zirconium dioxide ceramics synthesized in a beam of high-energy electron A. Dauletbekova ¹ , Ya. Kasatkina ² , S. Nikiforov ² , S. Zvonarev ² , D. Ananchenko ² , V. Lisitsyn ³ , M. Golkovskii ⁴ , Z. Baimukhanov ¹ , G. Akhmetova-Abdik ¹	M.03.03

1L.N. Gumilyov Eurasian National University: Satpayev Str., 2, 010008, Nur-Sultan, Kazakhstan, 2 Ural Federal University: Mira Str., 19, 620062, Yekaterinburg, RF, 3Tomsk Polytechnic University, 30, Lenin Ave., Tomsk, RF, 4Budker Institute of Nuclear Physics of SB RAS 11, Acad. Lavrentiev Ave., Novosibirsk, RF

- 15:15 **Spectral properties of YAG doped with europium of various concentration** **M.03.04**
 Zhanturina Nurgul, Lesniewski Tadeusz, Aimaganbetova Zukhra, Istlyaup Assel
 K. Zhubanov Aktobe Regional University, Gdansk University
- 15:30 **Coffee break**

Session 4 : NN

- 16:00 **Experimental and theoretical investigations of local environment of Mn ions in red phosphors** **M.04.01**
 Tomoyuki Yamamoto, Mekhrdod Subhoni, Umar Zafari, Musashi Sagayama, Mikhail G. Brik
 Waseda University, National Academy of Sciences of Tajikistan, National Academy of Sciences of Tajikistan, Waseda Univeristy, University of Tartu
- 16:30 **Nanoscale Trap Clusters in Halide Perovskite Semiconductors** **M.04.02**
 Miguel ANAYA
 University of Cambridge
- 17:00 **Ab initio modelling for predicting new chalcopyrite photovoltaic materials** **M.04.03**
 Jurij Grechenkov, Aleksejs Gopejenko, Dmitry Bocharov, Anatoli Popov, Mikhail Brik, Sergei Piskunov
 Jurij Grechenkov, Institute of Solid State Physics, Latvia, Aleksejs Gopejenko, Institute of Solid State Physics, Latvia, Dmitry Bocharov, Institute of Solid State Physics, Latvia, Anatoli Popov, Institute of Solid State Physics, Latvia, Mikhail Brik, Institute of Physics, University of Tartu, Sergei Piskunov, Institute of Solid State Physics, Latvia,
- 17:15 **In-plane stress-enhanced grain boundary segregation and interface diffusion in immiscible Cu/W nano-multilayers** **M.04.04**
 Vladyslav Turlo, Javier Fernandez Troncoso, Giacomo Lorenzin, Claudia Cancellieri, Lars P.H. Jeurgens

Poster session : NN

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| 17:30 | <p>Atomistic Simulations of Defects Production at Epitaxial Graphene on SiC</p> <p>Mitisha Jain, Silvan Kretschmer, Arkady V. Krasheninnikov</p> <p>Helmholtz-Zentrum Dresden Rossendorf, Institute of Ion beam physics and materials research, 01328, Dresden, Germany</p> | M.P.1 |
| 17:30 | <p>Simulation of a single-electron device based on endohedral fullerene (KI)@C180</p> <p>Assel Istlyaup1, Ainur Duisenova1,2, Lyudmila Myasnikova1, Daulet Sergeyev1,2</p> <p>1Department of Physics, K. Zhubanov Aktobe Regional State University, 34A Moldagulova avenue, 030000 Aktobe, Kazakhstan, 2Department of Radio Electronics, T. Begeldinov Aktobe Aviation Institute, 39 Moldagulova avenue, 030012 Aktobe, Kazakhstan</p> | M.P.2 |
| 17:30 | <p>A Study on Reaction Characteristics of Al-based Reactive Material Structures by Introduction of Nano Defects and Nano Interfaces</p> <p>Sang-Hyun Jung*(1), Jeong-Kwan Lee(1), Yun-Kwan Go(1), Jae-Deok Cho(1), Min-Gu Han(1), Jung-Su Park(1)</p> <p>The First Research and Development Institute-2nd Directorate, Agency for Defense Development</p> | M.P.3 |
| 17:30 | <p>Characterization of Porous-CdO/Porous-CdS nanocomposite obtaining electrochemical method</p> <p>Yana Suchikova1, Ihor Bohdanov1, Sergii Kovachov1, Aleksandra M. Moskina2, Tamara Tsebriienko*2, Anatoli I. Popov2</p> <p>1 Berdyansk State Pedagogical University (Ukraine), 2 Institute of Solid State Physics, University of Latvia (Latvia)</p> | M.P.4 |
| 17:30 | <p>Aluminum-magnesium spinel: optical effects of high-energy ion irradiation</p> <p>M. Mamatova1,2,3, V. Skuratov2,4,5, N. Kirilkin2, A. Oleiniczak 2,6, A. Mazanik7, N. Kazyutchits7, A. Dauletbekova1, Sh. Giniyatova1, A. Akilbekov1</p> | M.P.5 |

1L.N. Gumilyov Eurasian National University, Nur-Sultan, Kazakhstan 2Joint Institute for Nuclear Research, Dubna, Moscow Region, Russia 3The Astana branch of Institute of Nuclear Physics, Nur-Sultan, Kazakhstanm 4National Research Nuclear University MEPhI, Moscow, Russiam 5?Dubna? State University, Dubna, Moscow Region, Russiam 6Nicolaus Copernicus University, Torun, Polandm 7Belarusian State University, Minsk, Belarus

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|-------|---|---------------|
| 17:30 | <p>The formation and characterization of arsenolite crystallites on GaAs surface</p> <p>Yana Suchikova^{1 *}, Anatoli I. Popov ², Sergii Kovachov¹, Ihor Bohdanov¹, Aleksandra M. Moskina ², Tamara Tsebriienko²</p> <p>1. Berdyansk State Pedagogical University (Ukraine), 2. Institute of Solid State Physics, University of Latvia (Latvia)</p> | M.P.6 |
| 17:30 | <p>Statistical analysis of tensile deformation of Al nanowire</p> <p>Sweta Kumari, Amlan Dutta</p> <p>Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur, West Bengal, India ? 721302, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur, West Bengal, India ? 721302</p> | M.P.7 |
| 17:30 | <p>Computer simulation of the density of state of alkali halide nanocrystals</p> <p>Assel Istlyaup¹, Lyudmila Myasnikova¹, Kuanyshbek Shunkeyev¹, Daulet Sergeyev^{1,2}</p> <p>1Department of Physics, K. Zhubanov Aktobe Regional University, 34 A. Moldagulova avenue, 030000 Aktobe, Kazakhstan 2Department of Radio Electronics, T. Begeldinov Aktobe Aviation Institute, 39 A. Moldagulova avenue, 030012 Aktobe, Kazakhstan</p> | M.P.8 |
| 17:30 | <p>Modeling of core-structure and lattice resistance of twinning dislocation in FCC metals</p> <p>Sri Sadgun Reddy Pulagam, Amlan Dutta</p> <p>Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur, West Bengal 721302, India.</p> | M.P.10 |

- 17:30 **Elucidating the role of surfactants in growth and charge carrier dynamics of Cs₄CuSb₂Cl₁₂** **M.P.11**
 Samita Mishra, Ashwani Gurjar, Amit Kumar, Arijit K. De
 Ph.D. Scholar, Graduate student, Ph.D. Scholar, Associate Professor
- 17:30 **Calculation of physicochemical properties of alkali halide nanotubes** **M.P.12**
 Assel Istlyaup¹, Lyudmila Myasnikova¹, Kuanyshbek Shunkeyev¹, Daulet Sergeyev^{1,2}
¹Department of Physics, K. Zhubanov Aktobe Regional University, 34 A. Moldagulova avenue, 030000 Aktobe, Kazakhstan
²Department of Radio Electronics, T. Begeldinov Aktobe Aviation Institute, 39 A. Moldagulova avenue, 030012 Aktobe, Kazakhstan
- 17:30 **A role of intrinsic vacancy defects in electronic and optical properties of α -Ga₂O₃ crystal. Ab initio LCAO study.** **M.P.14**
 A. Usseinov (1), Zh. Koishybayeva (1), A. Platonenko (2), A. Akilbekov (1), M. Zdorovets (1,3) and A.I. Popov (2)
 (1) L.N. Gumilyov Eurasian National University, 2 Satpaeva Str., Nur-Sultan, Kazakhstan (2) Institute of Solid State Physics, University of Latvia, 8 Kengaraga Str., Riga LV1063, Latvia (3) Berdyansk State Pedagogical University, 4, Schmidta St., Berdiansk, Ukraine (4) Ural Federal University, Mira str. 19, Ekaterinburg, 620002, Russian Federation
- 17:30 **Computational studies of doped and functionalized cellulose-carbon nanocomposite materials** **M.P.15**
 Yu. Hizhnyi¹, V. Borysiuk¹, T. Isokov¹, S.G. Nedilko¹, M. Shegeda¹, Ya. Zhydachevskyy²
 1) Taras Shevchenko National University of Kyiv, 64 Volodymyrska st., Kyiv, Ukraine, 2) Institute of Physics Polish Academy of Sciences, al. Lotników 32/46 Warsaw, Poland
- 17:30 **Defect-related luminescence in fast neutron irradiated corundum crystals** **M.P.16**
 A. Lushchik*, E. Feldbach*, A. Krasnikov*, A.I. Popov**, V. Seeman*, E. Shablonin*,

* Institute of Physics, University of Tartu, W. Ostwald Str. 1, 50411 Tartu, Estonia ** Institute of Solid State Physics, University of Latvia, Kengaraga 8, Riga LV-1063, Latvia

17:30 **Study of defect induced effects in REVO4 nanoparticles doped with Ca cations** **M.P.17**

O. Chukova^{1,4}, S.A. Nedilko¹, S.G. Nedilko^{1,4}, T. Voitenko¹, A. Papadopoulos², E. Stratakis², M. Etter³, H.S. Rahimi Mosafer⁴, W. Paszkowicz⁴

1 - Taras Shevchenko National University of Kyiv, Ukraine, 2 - Institute of Electronic Structure & Laser, FORTH, Heraklion, Crete, Greece, 3 - FS-PETRA-D, P02.1, Deutsches Elektronen-Synchrotron (DESY) Hamburg, Germany, 4 - Institute of Physics, Polish Academy of Sciences, Warsaw, Poland

17:30 **Structural studies of the Radiation assisted synthesized gallium oxide ceramics** **M.P.18**

A. Usseinov⁽¹⁾, Zh. Karipbayev⁽¹⁾, V. Lisitsyn⁽²⁾, A. Kozlovskiy^(1,3), Zh. Koishybayeva⁽¹⁾, A. Akilbekov⁽¹⁾, M. Zdorovets^(1,3,4) and A.I. Popov^(1,5)

(1) L.N. Gumilyov Eurasian National University, 2 Satpaeva Str., Nur-Sultan, Kazakhstan (2) National Research Tomsk Polytechnic University, Tomsk, Russian Federation (3) The Institute of Nuclear Physics, Ibragimov str., 1, Almaty, 050032, Kazakhstan (4) Ural Federal University, Mira str. 19, Ekaterinburg, 620002, Russian Federation (5) Institute of Solid State Physics, University of Latvia, 8 Kengaraga Str., Riga LV1063, Latvia

17:30 **MgAl₂O₄:Cr³⁺ - experimental and theoretical analysis of the optical spectra** **M.P.19**

N. Mironova-Ulmane, M.G. Brik, J. Grube, G. Krieke, A. Antuzevics, V. Skvortsova, M. Kemere, E. Elsts, A. Sarakovskis, M. Piasecki, A.I. Popov

a Institute of Solid State Physics, University of Latvia, Kengaraga Street 8, LV-1063, Riga, Latvia b College of Sciences & CQUPT-BUL Innovation Institute, Chongqing University of Posts and Telecommunications, Chongqing, 400065, People's Republic of China c Institute of Physics, China d Institute of Physics, University of Tartu, W. Ostwald Str. 1, Tartu, 50411, Estonia e Faculty of Science and Technology, Jan DŁugosz University, Armii Krajowej 13/15, PL-42200, CzÅ™stochowa, Poland f Academy of Romanian Scientists, Ilfov Str. No. 3, 050044, Bucharest, Romania g Department of Solid State Physics, Eastern European National University, Voli Ave. 13, Lutsk, 43025, Ukraine

17:30 **Determining GaN (non)Luminescent Defect Distribution by Super/Sub-Bandgap Surface Photovoltage Spectroscopy** **M.P.20**

Sumesh Sadhujan^{1,#}, Sherina Harilal^{1,#}, Nursidik Yulianto^{2,3}, Andam Deatama Refino^{2,4}, Hutomo Suryo Wasisto^{2,5}, Awad Shalabny¹, and Muhammad Y. Bashouti^{1,6,*}

1 Department of Solar Energy and Environmental Physics, Swiss Institute for Dryland Environmental and Energy Research, J. Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Midreshet Ben-Gurion, Building 26, Be'er Sheva 8499000, Israel. 2 Institute of Semiconductor Technology (IHT) and Laboratory for Emerging Nanometrology (LENA), Technische Universität Braunschweig, Braunschweig 38106, Germany. 3 Research Center for Physics, Indonesian Institute of Sciences (LIPI), Jl. Kawasan Puspiptek No. 441-442, South Tangerang 15314, Indonesia. 4 Engineering Physics Program, Institut Teknologi Sumatera (ITERA), Jl. Terusan Ryacudu, Way Huwi, Lampung Selatan, Lampung 35365, Indonesia. 5 PT Nanosense Instrument Indonesia, Umbulharjo, Yogyakarta 55167, Indonesia. 6 The IISe-Katz Institute for Nanoscale Science & Technology, Ben-Gurion University of the Negev, POB 653, Beer-Sheva Campus, Building 51, Be'er Sheva 8410501, Israel. # Contributed equally to this work. * Corresponding author. E-mail: Bashouti@bgu.ac.il

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| 17:30 | <p>Effect of radiation on the electrical properties of oxidized porous silicon – reduced graphene oxide hybrid structures</p> <p>I.B.Â Olenych, O.S.Â Dzendzeliuk
Ivan Franko National University of Lviv</p> | M.P.21 |
| 17:30 | <p>Doping Zinc Oxide Nanoparticles by Magnetic and Nonmagnetic Nanocomposites Using Organic Species for Fast Removal of Industrial</p> <p>Osama Saber , Mostafa Osama , Nagih M. Shaalan , Aya Osama , Adil Alshoaibi and Doaa Osama</p> <p>Al Bilad Bank Scholarly Chair for Food Security in Saudi Arabia, The Deanship of Scientific Research, The Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, P.O. Box 400, Al-Ahsa 31982, Saudi Arabia</p> | M.P.22 |
| 17:30 | <p>Structural and optical characterization of TiO2 nanocrystalline materials synthesized by different methods.</p> | M.P.23 |

Alise Podelinska¹, Vera Serga², Hanna Bandarenka³, Siarhei Zavatski³, Aliaksandr Burko³, Vladimir Pankratov¹, Sergei Piskunov¹, Anatoli I. Popov¹, Dmitry Bocharov¹

¹Institute of Solid State Physics, University of Latvia, Kengaraga 8, Riga, Latvia, ²Institute of Materials and Surface Engineering, Faculty of Materials Science and Applied Chemistry, Riga Technical University, P.Valdena 7, LV-1048 Riga, Latvia, ³Belarusian State University of Informatics and Radioelectronics, 6 Brovka st., Minsk, 220013, Belarus

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| 17:30 | <p>Ab initio calculations of Cu-doped TiO₂ thin films for antibacterial applications</p> <p>Elina Neilande¹, Yin-Pai Lin¹, Siarhei Zavatski², Hanna Bandarenka², Anatoli I. Popov¹, Sergei Piskunov¹, and Dmitry Bocharov¹</p> <p>¹Institute of Solid State Physics, University of Latvia, Kengaraga 8, Riga, Latvia ²Belarusian State University of Informatics and Radioelectronics, P.Brovka St., Minsk, 220013, Belarus</p> | M.P.24 |
| 17:30 | <p>Structure and magnetic properties of Ni-doped tin oxide films</p> <p>V.K. Ksenevich ^{Đ°}, V.A. Dorosinets ^{Đ°}, D.V. Adamchuk ^{Đ°}, M.A. Samarina ^{Đ°}, A.I. Lyubchik ^b</p> <p>^{Đ°} Belarusian State University, Nezalezhnastsi ave. 4, 220030 Minsk, Belarus, ^b Research Centre in Industrial Engineering Management and Sustainability, LusÁlfona University, Campo Grande, 376, 1749-024 Lisboa, Portugal</p> | M.P.25 |
| 17:30 | <p>Structural studies of the radiation assisted synthesized gallium oxide ceramics</p> <p>Karipbayev Zh.T.(1), Lisitsyn V.M.(2), Usseinov A.B.(1), Popov A.I.(1, 3), Brik M.(4), Koketai T.A. (5), Bakytkyzy A. (1)</p> | M.P.26 |

(1) Eurasian National University, 2, Satpayev Str., 010008 Astana, Kazakhstan, (2) National Research Tomsk Polytechnic University, 30 Lenin Ave., 634050 Tomsk, Russia, (3) Institute of Solid State Physics, University of Latvia, 8 Kengaraga st., Riga, Latvia, (4) Institute of Physics, University of Tartu, W. Ostwald 1, Tartu 50411, Estonia (5) Karaganda Buketov University 100028, st. Universitetskaya 28, Karaganda, Kazakhstan

17:30 **Radiation induced defects in cerium doped GAGG single crystals induced by swift heavy ions** **M.P.27**

V. Pankratova¹, V.A. Skuratov^{2,3,4}, O.A. Buzanov⁵, A.A. Mololkin⁵, A.P. Kozlova⁶, A. Kotlov⁷, A.I. Popov¹, V. Pankratov¹

1 Institute of Solid State Physics, University of Latvia, Kengaraga iela 8, LV-1063 Riga, Latvia, 2 Joint Institute for Nuclear Research, Joliot-Curie 6, 141980, Dubna, Moscow Region, Russia, 3 National Research Nuclear University MEPhI, Kashirskoye h., 31, 115409, Moscow, Russia, 4 Dubna State University, Universitetskaya 19, 141980, Dubna, Moscow Region, Russia, 5 OJSC Fomos-Materials Co., Buzheninova street 16, 107023 Moscow, Russia, 6 National University of Science and Technology "MISIS", Leninsky Pr. 4, Moscow, Russia, 7 Photon Science at DESY, Notkestrasse 85, 22607 Hamburg, Germany

17:30 **Luminescence efficiency of YAG:Ce, Gd, Ga ceramics synthesized by radiation assisted method** **M.P.28**

Zhilgildinov Zh. (1), Karipbayev Zh.T.(1), Lisitsyn V.M.(2), Popov A.I.(1, 3), Musskhanov D.A. (1), Bakytkyzy A. (1), Zhunusbekov A.M.(1)

(1) Eurasian National University, 2, Satpayev Str., 010008 Astana, Kazakhstan, (2) National Research Tomsk Polytechnic University, 30 Lenin Ave., 634050 Tomsk, Russia, (3) Institute of Solid State Physics, University of Latvia, 8 Kengaraga st., Riga, Latvia

17:30 **Preparation and optical properties of K₂O-P₂O₅-MoO₃-Bi₂O₃-KBi(MoO₄)₂:Eu glass-ceramics** **M.P.29**

V. Chornii(1,2), V. Boyko(1), Yu. Hizhnyi(2), S.G. Nedilko(2), K. Terebilenko(2), M. Slobodyanik(2)

- (1) National University of Life and Environmental Sciences of Ukraine, 15 Geroiv Oborony st., Kyiv, Ukraine, (2) Taras Shevchenko National University of Kyiv, 64/13 Volodymyrska st., Kyiv, Ukraine
- 17:30 **Ag₂O-HgCdTe nanocomposite formed by silver ion implantation for multispectral detection** **M.P.30**
 Oleksii Smirnov*, Rada Savkina, Oleksandr Gudymenko
 *presenting person
 V. Lashkaryov Institute of Semiconductors Physics, NAS of Ukraine, Nauky av.41, 03028 Kyiv, Ukraine
- 17:30 **Evolution of free-volume defects in the Cu_{0.1}Ni_{0.8}Co_{0.2}Mn_{1.9}O₄ ceramics caused by interphase mass-transfer processes** **M.P.31**
 H. Klym (1), I. Karbovnyk (1,2), A.I. Popov (3)
 (1) Lviv Polytechnic National University, Lviv, Ukraine (2) Ivan Franko National University of Lviv, Lviv, Ukraine (3) Institute of Solid State Physics, University of Latvia, Riga, Latvia
- 17:30 **Extended free-volume defects in doped BaTiO₃ ceramics** **M.P.32**
 H. Klym (1), Kostiv (1), A.I. Popov (2)
 (1) Lviv Polytechnic National University, Lviv, Ukraine (2) Institute of Solid State Physics, University of Latvia, Riga, Latvia
- 17:30 **Luminescence of cerium doped LYSO single crystals under VUV excitations** **M.P.33**
 V. Pankratova¹, A.I. Popov¹, D. Bocharov¹, K. Chernenko², V. Pankratov¹
¹Institute of Solid State Physics, University of Latvia, Kengaraga iela 8, LV-1063 Riga, Latvia, ²MAX IV Laboratory, Lund University, P.O. Box 118, Lund, SE-22100, Sweden
- 17:30 **Study of ion induced radiation effects in optical materials using synchrotron VUV techniques** **M.P.34**
 V. Pankratov¹, V.A. Skuratov², ³, ⁴, K. Chernenko⁵, A. Kotlov⁶, V. Pankratova¹, A.I. Popov¹

1 Institute of Solid State Physics, University of Latvia, 8 Kengaraga, LV-1063 Riga, Latvia, 2 Joint Institute for Nuclear Research, Joliot-Curie 6, 141980, Dubna, Moscow Region, Russia, 3 National Research Nuclear University MEPhI, Kashirskoye h., 31, 115409, Moscow, Russia, 4 Dubna State University, Universitetskaya 19, 141980, Dubna, Moscow Region, Russia, 5 MAX IV Laboratory, Lund University, PO Box 118, SE-22100 Lund, Sweden, 6 Photon Science at DESY, Notkestrasse 85, 22607 Hamburg, Germany

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|-------|---|---------------|
| 17:30 | <p>Nanostructurization of free-volume defects in GeS₂-Ga₂S₃-CsCl chalcogenide glasses studied with positron-positronium trapping</p> <p>H. Klym (1), A. Ingram (2), I. Karbovnyk (1,3), A.I. Popov (4)</p> <p>(1) Lviv Polytechnic National University, Lviv, Ukraine (2) Opole University of Technology, Opole, Poland (3) Ivan Franko National University of Lviv, Lviv, Ukraine (4) Institute of Solid State Physics, University of Latvia, Riga, Latvia</p> | M.P.35 |
| 17:30 | <p>Positron-positronium trapping defects near grain boundaries in the modified MgO-Al₂O₃ ceramics</p> <p>H. Klym (1), A. Ingram (2), I. Hadzaman (3), A.I. Popov (4)</p> <p>(1) Lviv Polytechnic National University, Lviv, Ukraine (2) Opole University of Technology, Opole, Poland (3) Ivan Franko Drohobych State Pedagogical University, Drohobych, Ukraine (4) Institute of Solid State Physics, University of Latvia, Riga, Latvia</p> | M.P.36 |
| 17:30 | <p>Structural and electrical study of PEDOT:PSS nanocomposites before and after irradiation</p> <p>Karbovnyk I.(1,2), I. Zhudenko (2,3) Chalyy D. (3), Klym H. (2)</p> <p>(1) Ivan Franko National University of Lviv, Lviv, Ukraine (2) Lviv Polytechnic National University, Lviv, Ukraine (3) Lviv State University of Life Safety, Lviv, Ukraine</p> | M.P.37 |
| 17:30 | <p>Investigation of Radiation Damage Processes in Lithium Ceramics under High-Temperature Irradiation</p> <p>Artem Kozlovskiy^{1,2}, Dmitriy I. Shlimas^{1,2}</p> | M.P.38 |

1 Laboratory of Solid State Physics, The Institute of Nuclear Physics, Almaty 050032, Kazakhstan 2 Engineering Profile Laboratory, L.N. Gumilyov Eurasian National University, Nur-Sultan 010008, Kazakhstan

- 17:30 **Investigation of the efficiency of shielding gamma and electron radiation by TeO₂ - WO₃ - Bi₂O₃ - MoO₃ - SiO glasses.** **M.P.39**

Artem Kozlovskiy (1,2), Dmitriy I. Shlimas (1,2), Maxim V. Zdorovets (1,2), Elena Popova (3), Edgars Elsts (4), Anatoli I. Popov (1,4)

(1) L.N. Gumilyov Eurasian National University, Nur-Sultan, Kazakhstan, kozlovskiy.a@inp.kz (A.K.), (2) The Institute of Nuclear Physics of Republic of Kazakhstan, Almaty, Kazakhstan, (3) Centro de Investigaci3n en Astronom3a, Universidad Bernardo O3a™ Higgins, Santiago 8370854, Chile, (4) Institute of Solid State Physics, University of Latvia, LV-1063 Riga, Latvia,

- 17:30 **Ferromagnetic resonance in Fe/Nb/Fe/IrMn spin valves** **M.P.40**

M. A. Sousa 1, M. S. Pessoa 2, N. A. Sobolev 3, F. Pelegriani 4, E. Baggio-Saitovitch 5

1 Unidade Acad3mica de Ci3ncias Exatas e Tecnol3gicas, Universidade Federal de Jata3, Jata3, Brasil 2 Departamento de Ci3ncias Naturais, Universidade Federal do Espirito Santo, S. Mateus, Brasil 3 Departamento de F3sica and i3N, Universidade de Aveiro, Aveiro, Portugal 4 Instituto de F3sica, Universidade Federal de Goi3s, Goi3nia, Brasil 5 Centro Brasileiro de Pesquisas F3sicas, Rio de Janeiro, Brasil

- 17:30 **Study of Helium Swelling in SiC Ceramics** **M.P.41**

Artem L. Kozlovskiy 1, Vladimir Uglov 2

1Engineering Profile Laboratory, L.N. Gumilyov Eurasian National University, Nur-Sultan 010008, Kazakhstan 2Department of Solid State Physics, Belarusian State University, 220050, Minsk, Belarus

- 17:30 **Radiation-induced point defects and processes in ionic oxides – where we are standing now and what we understand better** **M.P.42**

A. I. Popov (1), V. Kuzovkov (1), E. A. Kotomin (1), A. Lushchik (2)

(1) Institute of Solid State Physics, University of Latvia, Riga, Latvia (2) Institute of Physics, University of Tartu, Estonia

17:30 **Thermostimulated luminescence measurements of neutron, electron irradiated and thermochemically-reduced Y3Al5O12 and Gd3Ga5O12** **M.P.43**

E. Elsts (1), E. Popova (1,2), V. Kuzovkov (1), A. I. Popov (1)

(1) Institute of Solid State Physics, University of Latvia (2) Centro de Investigaci3n en Astronom3a, Universidad Bernardo O'Higgins, Santiago 8370854, Chile

17:30 **Cathodoluminescence study of AlN nanotube/CsI scintillator and AlN nanotube/polymer composites.** **M.P.44**

E. Popova (1,2), E. Elsts (1), A. Moskina (1), C. Balasubramanian (3), O.I. Aksimentyeva (4), A.I. Popov (1)

(1) Institute of Solid State Physics, University of Latvia, Latvia (2) Centro de Investigaci3n en Astronom3a, Universidad Bernardo O'Higgins, Santiago 8370854, Chile (3) Institute for Plasma Research, Bhat, Gandhinagar, 382 044. India (4) Ivan Franko National University of Lviv, 79017 Lviv, Ukraine

17:30 **Case analysis of self-trapped hole V_k center mobility in metal fluorides and fluoroperovskites** **M.P.45**

E. Popova (1, 2), A. I. Popov (2)

(1) Centro de Investigaci3n en Astronom3a, Universidad Bernardo O'Higgins, Santiago 8370854, Chile (2) Institute of Solid State Physics, University of Latvia, 8 Kengaraga, LV-1063, Riga, Latvia

WEDNESDAY, 21 SEPTMEBER 2022

12:30 **Lunch**

Session 7 : NN

14:30 **The point defect segregation to grain boundaries in random Fe-Cr alloys: atomistic level modelling.** **M.07.01**

M. Zem?a a, J. S. Wr3bel a, D. Nguyen-Manh b, C.-C. Fu c, F. Soisson c, T. Wejrzanowski a

a Faculty of Materials Science and Engineering, Warsaw University of Technology, Wołoska 141, 02-507 Warsaw, Poland b UK Atomic Energy Authority, Culham Centre for Fusion Energy, Abingdon, Oxon OX14 3DB, UK c Université Paris-Saclay, CEA, Service de Recherches de Métallurgie Physique, F-91191 Gif-sur-Yvette, France

- 14:45 **First principles study of phonon splitting and anharmonicity in defected titanium disulfide (TiS₂)** **M.07.02**
Konrad Wilczynski, Mariusz Zdrojek
Faculty of Physics, Warsaw University of Technology, Koszykowa 75, 00-662 Warsaw, Poland
- 15:00 **Irradiation effects on the mechanical properties of polycrystalline BCC metals by machine learning based atomistic simulations** **M.07.03**
F. J. Dominguez-Gutierrez, R. Alvarez-Donado, S. Bonfanti, S. Papanikolaou, P. Sobkowicz, M. J. Alava
NOMATEN Centre of Excellence, National Centre for Nuclear Research, ul. A. Soltana 7, 05-400 ,Otwock/Swierk, Poland.
- 15:15 **Defects are the condition of stability of monolayer gold flakes** **M.07.04**
A.A. Romansky, L.I. Karbivska, N.A. Kurgan, V.V. Zaika, V.L. Karbivskyy
G.V. Kurdyumov Institute for Metal Physics of the NAS of Ukraine
- 15:30 **Coffee break**

Session 8 : NN

- 16:00 **Heavy ion irradiation induced defects in emerging memory materials ? crystallinity, microstructure and electrical properties** **M.08.01**
Vogel, T. (1), Zintler, A. (1), Kaiser, N. (1), Kämpfe, T. (2), Lederer, M. (2), Guillaume, N. (3), Serra, A. L. (3), Lefèvre, G. (3), Piros, E. (1), Winkler, R. (1), Olivo, R. (2), Ali, T. (2), Lehninger, D. (2), Charpin-Nicolle, C. (3), David, S. (3), Navarro, G. (3), Vallée, C. (3), Seidel, K. (2), Novak, E. (3), Molina-Luna, L. (1), Trautmann, C. (4), & Alff, L. (1)

(1) Institut of Materials Science, TU Darmstadt, Darmstadt, Germany, (3) Fraunhofer IPMS, Dresden, Germany, (4) CEA LETI, Grenoble, France, (5) GSI Helmholtzzentrum, Darmstadt, Germany & Institute of Materials Science, TU Darmstadt, Darmstadt, Germany.

16:15 **Experimental-theoretical analysis track effects in silicon nitride irradiated with swift heavy ions** **M.08.02**

A. Akilbekov^{1*}, V. Skuratov², A. Zhumazhanova^{1,3}, A. Mutali^{1,2,3}, A. Ibrayeva^{1,2,3}, E. Korneeva², R. Rymzhanov^{1,2,3}, Sh. Giniyatova¹, A. Dauletbekova¹

¹ L.N. Gumiyov Eurasian National University: Satpaev Str., 2, Nur-Sultan, Kazakhstan, 010008 ² FLNR, Joint Institute for Nuclear Research: Joliot Curie Str., 6, Dubna, Russia, 141980 ³ Astana Branch of the Institute of Nuclear Physics: Abylaikhan Ave., 1/3, Nur-Sultan, Kazakhstan, 010008

16:30 **ABO₃ perovskite as well as BaF₂, CaF₂ and SrF₂ bulk and surface F-center first principles computations** **M.08.03**

Roberts Eglitis (1), Juris Purans (1), Ran Jia (1,2)

(1) Institute of Solid State Physics, University of Latvia, 8 Kengaraga Str., Riga LV1063, Latvia, (2) Laboratory of Theoretical and Computational Chemistry, Institute of Theoretical Chemistry, Jilin University, Changchun 130023, China

17:00 **Calculated properties of the self-trapped exciton in diamond and related materials from DFT calculations** **M.08.04**

A. Platonenko*, W.C. Mackrodt**, R. Dovesi**, A. Lushchik[^]

*Institute of Solid State Physics, University of Latvia, 8 Kengaraga street, LV1063, Riga, Latvia **Dipartimento di Chimica, Università di Torino, Via P. Giuria 5, 10125 Torino, Italy [^]Institute of Physics University of Tartu, W. Ostwaldi 1, 50411 Tartu, Estonia

17:15 **Boron Nitride nanomaterials and their applications** **M.08.05**

Dr Srikanth Mateti

Institute for Frontier Materials, Deakin University, Geelong, 3216, Australia.

Session 5 : NN

- 9:00 **Band Gap Engineering and Trap Depths of Intrinsic Point Defects in RAIO_3 ($\text{R} = \text{Y, La, Gd, Yb, Lu}$) Perovskites** **M.05.01**
- Ya. Zhydachevskyy (a,b), Yu. Hizhnyi (c), S.G. Nedilko (c), I. Kudryavtseva (d), V. Pankratov (e), V. Stasiv (a), L. Vasylechko (b), D. Sugak (b), A. Lushchik (d), M. Berkowski (a), A. Suchocki (a), N. Klyui (f,g)
- (a) Institute of Physics, Polish Academy of Sciences, aleja Lotników 32/46, Warsaw 02 668, Poland, (b) Lviv Polytechnic National University, S. Bandera Str. 12, Lviv 79013, Ukraine, (c) Taras Shevchenko National University of Kyiv, Volodymyrska Str. 60, Kyiv 01033, Ukraine, (d) Institute of Physics, University of Tartu, W. Ostwald Str. 1, Tartu 50411, Estonia, (e) Institute of Solid State Physics, University of Latvia, Kengaraga Str. 8, Riga 1063, Latvia, (f) College of Physics, Jilin University, 2699 Qianjin Str., Changchun 130012, China, (g) V.E. Lashkaryov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, 41 prospekt Nauki, Kyiv 03028, Ukraine
- 9:30 **Implication of nanostructuring approaches in higher manganese silicides** **M.05.02**
- Nagendra S. Chauhan, Ichiro Ono, Kei Hayashi, and Yuzuru Miyazaki
- Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Miyagi, Japan - 980-8579
- 9:45 **Magnetization of Magnetically Inhomogeneous $\text{Sr}_2\text{FeMoO}_6$ -d Nanoparticles** **M.05.03**
- Gunnar Suchanek 1, Nikolai Kalanda 2, Marta Yarmolich 2, Evgenii Artiukh 1,2, Gerald Gerlach 1, and Nikolai A. Sobolev 3
- 1 Solid-State Electronics Laboratory, TU Dresden, 01062 Dresden, Germany, 2 Cryogenic Research Division, Scientific-Practical Materials Research Centre of NAS of Belarus (SSPA), 220072 Minsk, Belarus, 3 i3N and Departamento de Física, Universidade de Aveiro, 3810-193 Aveiro, Portugal

10:00 **Defect-assisted ion transport in magneto-ionic functional oxides and nitrides probed by positrons** **M.05.04**

M. O. Liedke [1], M. Butterling [1], J. de Rojas [2], A. Quintana [3], A. LopeandÅa [2], E. MenÅ©ndez [2], J. L. Costa-KrÅ×mer [4], E. Hirschmann [1], A. G. Attallah [1], J. Sort [2,5], A. Wagner [1]

[1] Institute of Radiation Physics, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany, [2] Departament de FÅsica, Universitat AutÅnoma de Barcelona, Cerdanyola del Valle?s, Spain, [3] Physics, Georgetown University, Washington, DC, United States, [4] IMN-Instituto de Micro y NanotecnologÅa (CNM-CSIC), Madrid, Spain, [5] InstituciÅł Catalana de Recerca i Estudis AvanÅšats (ICREA), Barcelona, Spain.

10:15 **Engineering of defect complexes in ZnO nanowires grown by chemical bath deposition using oxygen plasma treatment** **M.05.05**

Dieulesaint, A.*(1), Villafuerte, J. (1,2), Chaix-Pluchery, O. (1), Weber, M. (1), Donatini, F. (2), Pernot, J. (2), BÅs, A. (3), Lacoste, A. (3), Consonni, V. (1) & Sarigiannidou, E. (1).

(1)UniversitÅ© Grenoble Alpes, CNRS, Grenoble INP, LMGP, F-38000 Grenoble, France (2)UniversitÅ© Grenoble Alpes, CNRS, Grenoble INP, Institut NEEL, F-38000 Grenoble, France (3)UniversitÅ© Grenoble Alpes, CNRS, IN2P3, LPSC, F-38000 Grenoble, France

10:30 **Coffee break**

Session 6 : NN

11:00 **Impact of composition and crystal structure on luminescence and non-linear optical properties in the mid-infrared spectral range** **M.06.01**

Michal Piasecki1, G.L. Myronchuk2, Andrzej Suchocki3, Anatoli Popov4, Mikhail G. Brik1,5,6,7, I.E. Barchiy8

1 Department of Theoretical Physics, J. Dlugosz University, Armii Krajowej 13/15, 42-200 Czestochowa, Poland, 2 Faculty of Information Systems, Physics and Mathematics, Lesya Ukrainka Eastern European National University, 9 Potapova Str., UA-43021 Lutsk, Ukraine, 3 Institute of Physics, Polish Academy of Sciences, Warszawa, Poland, 4 Institute of Solid-State Physics, University of Latvia, Riga LV 1063, Latvia, 5 Institute of Physics, University of Tartu, W. Ostwald Str. 1, Tartu 50411, Estonia, 6 College of Sciences & CQUPT-BUL Innovation Institute, Chongqing University of Posts and Telecommunications, Chongqing 400065, People's Republic of China, 7 Academy of Romanian Scientists, Ilfov Street, no 3, 050044 Bucharest, Romania, 8 Inorganic Chemistry Department, Uzhhorod National University, 46 Pidhirna, UA-88000, Uzhhorod, Ukraine

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|-------|--|----------------|
| 11:30 | <p>Designing Novel Strategy to Produce Active Nanohybrids in Sunlight for Purification of Water Based on Inorganic Nanolayers, Magn</p> <p>Osama Saber, Mostafa Osama, Nagih M. Shaalan, Aya Osama, Adil Alshoaibi, and Doaa Osama</p> <p>Al Bilad Bank Scholarly Chair for Food Security in Saudi Arabia, The Deanship of Scientific Research, The Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, P.O. Box 400, Al-Ahsa 31982, Saudi Arabia</p> | M.06.02 |
| 11:45 | <p>NAMD simulations of Cl/TiO₂(110)/water interface for photocatalytic seawater splitting</p> <p>Yin-Pai Lin, Dmitry Bocharov, Guntar Zvejnieks, Alexander Popov, Inta Isakovica, and Sergei Piskunov</p> <p>Institute of Solid State Physics, University of Latvia, 8 Kengaraga str., Riga LV-1063, Latvia</p> | M.06.03 |
| 12:00 | <p>Ab initio calculations of Cu-doped TiO₂ thin films for antibacterial applications</p> <p>Elina Neilande¹, Yin-Pai Lin¹, Siarhei Zavatski², Hanna Bandarenka², Anatoli I. Popov¹, Sergei Piskunov¹, and Dmitry Bocharov¹</p> | M.06.04 |

1Institute of Solid State Physics, University of Latvia, Kengaraga
8, Riga, Latvia, 2Belarusian State University of Informatics and
Radioelectronics, P.Brovka St., Minsk, 220013, Belarus

12:15 **In-situ Raman spectroelectrochemical studies of carbon
based materials using concentrated aqueous electrolyte solution** **M.06.05**

Ghulam Abbas^{1,2}, Matěj Velický², Martin Kalbáček², Otakar
Frank²

¹Department of Physical Chemistry and Macromolecular
Chemistry, Faculty of Science, Charles University in Prague,
Hlavova 2030, 128 43 Prague 2, Czech Republic ²J. Heyrovsky
Institute of Physical Chemistry of CAS, v.v.i, Doležalkova 2155/3,
183 23 Prague 8, Czech Republic



Symposium N

Sessions: Room 315| Main Building

Poster Session: Small Hall| Main Building

Materials for a sustainable transition:

Modelling and characterization of novel functional materials for green energy, sensing, and catalysis applications

Symposium Organizers: **Biplab SANYAL** Uppsala University Sweden

Francesco RUFFINO University of Catania Italy

Jost ADAM Mads Clausen Institute Denmark

Sangeeta SHARMA Max-Born Institute for Nonlinear Optics and Short Pulse Spectroscopy
Germany

Symposium N Program

MONDAY, 19 SEPTEMBER 2022

Materials for Energy Conversion I : B. Sanyal, J. Adam

- 9:00 **Exciton--phonon interaction calls for a revision of the ``exciton" concept** **N.I.1**
Andrea Marini

Istituto di Struttura della Materia, National Research Council, Italy
- 9:30 **Chlorine Activated Stacking Fault Removal Mechanism in Thin Film CdTe Solar Cells: The Missing Piece** **N.I.2**
Pooja Goddard*, Peter Hatton, Michael J. Watts, John M. Walls, Ali Abbas, Roger Smith
Department of Chemistry, Loughborough University
- 10:00 **Spectral Splitting Geometries for High Efficiency Multijunction Organic Solar Cells** **N.I.3**

Miquel Casademont-Viñas a, Martí Gibert-Roca a, Quan Liu b, Koen Vandewal b, Alejandro R. Goñi a, c, Mariano Campoy-Quiles a.

a Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Spain, Campus UAB, Bellaterra, Spain b U Hasselt – Hasselt University, Institute for Materials Research (IMO-IMOMEC), BE, Agoralaan – Building D, Diepenbeek, Belgium c Catalan Institution for Research and Advanced Studies (ICREA), Passeig Lluís Companys, 23, 08010, Barcelona, Spain
- 10:15 **A combinatorial approach to clarify the role of Cu and Na in Cu(In,Ga)S₂ solar cells** **N.I.4**
Léo Choubrac, Eugène Berlin, Nicolas Barreau
Nantes Université, CNRS, Institut des matériaux de Nantes Jean Rouxel, IMN, F-44000 Nantes, France
- 10:30 **Investigation of degradation mechanisms in perovskite solar cells via coupled ion and steady-state drift-diffusion simulations** **N.I.5**

Ivona Kafedjiska, Vincent M. Le Corre, Rutger Schlatmann, Iver Lauermann

Helmholtz-Zentrum Berlin (HZB), Competence Centre Photovoltaics (PVcomB), Berlin, Germany, University of Erlangen-Nuremberg (Friedrich-Alexander-Universität Erlangen-Nürnberg), Erlangen, Germany, Helmholtz-Zentrum Berlin (HZB), Competence Centre Photovoltaics (PVcomB), Berlin, Germany and Faculty 1 - Energy and Information, Hochschule für Technik und Wirtschaft Berlin, Germany, Helmholtz-Zentrum Berlin (HZB), Competence Centre Photovoltaics (PVcomB), Berlin, Germany.

11:00 **Coffee Break**

Advanced Characterization I : J. Adam

11:30 **Laser based synthesis of Ni/Ni(OH)₂ nanoparticles for oxygen evolution reaction** **N.II.1**

V. Iacono (1,2), L. Bruno (1,2), E. Bruno (1,2), F. Ruffino (1,2), S. Mirabella (1,2)

(1) Dipartimento di Fisica e Astronomia "Ettore Majorana", Università di Catania, via S. Sofia 64, 95123 Catania, Italy, (2) CNR-IMM (Catania Università), via S. Sofia 64, 95123 Catania, Italy,

11:45 **Detection of analytes with Si nanowires/Ag nanostructures fabricated with MACE technique by Surface-Enhanced Raman spectroscopy** **N.II.2**

Ioannis Kochylas, Anastasios Dimitriou, Maria-Christina Skoulikidou, Lampros Patsiouras, Maria-Athina Apostolaki, Georgia Geka, Anastasia Kanioura, Panagiota Petrou, Nikolaos. Papanikolaou, Vlassis Likodimos, Spiros Gardelis

Section of Condensed Matter Physics, Department of Physics, National and Kapodistrian University of Athens, Panepistimiopolis, 15 784, Greece, Institute of Nanoscience and Nanotechnology, National Center for Scientific Research "Demokritos", 15341 Aghia Paraskevi, Athens, Greece, Institute of Nuclear & Radiological Sciences & Technology, Safety & Energy, National Center for Scientific Research "Demokritos", 15341 Agia Paraskevi, Athens, Greece

12:00 **Characterization of battery materials with stacking faults using the FAULTS software** **N.II.3**

Jon Serrano-Sevillano¹, Marine Reynaud¹, Montse Casas-Cabanas^{1,2}

1.Centro de Investigación Cooperativa de Energías Alternativas (CIC energigUNE), Basque Research and Technology Alliance (BRTA), Parque Tecnológico de Alava, Albert Einstein 48, 01510 Vitoria-Gasteiz, España, 2. IKERBASQUE, Basque Foundation for Science, María Díaz de Haro 3, 48013, Bilbao, Spain

12:15 **Electrodeposition and characterization of Dense and Mesoporous FePd Nanowires for SERS applications** **N.II.4**

Deepti Raj (a), Gabriele Barrera (b), Federica Celegato (b), Aliona Nicolenco (c), Federico Scaglione (a), Jordi Sort (c,d), Eva Pellicer (c), Paola Tiberto (b), Paola Rizzi (a)

(a) Dipartimento di Chimica e Centro Interdipartimentale NIS (Nanostructured Surfaces and Interfaces), Università di Torino, Via Pietro Giuria 7, 10125 Torino, Italy, (b) Istituto Nazionale di Ricerca Metrologica (INRIM), Str. delle Cacce 91, 10135 Torino, Italy, (c) Universitat Autònoma de Barcelona, Campus de la UAB, Plaça Càvica, 08193, Bellaterra, Barcelona, Spain, (d) ICREA, Pg. Lluís Companys 23, E-08010 Barcelona, Spain

12:30 **Combined SEM and SThM for mechanical and thermal evaluation of suspended nanowires** **N.II.5**

Jose M. Sojo-Gordillo, P. Olivier Chapuis, S  verine Gomes, Alex Morata, Albert Taranc  n

Catalonia Institute for Energy Research (IREC), Jardins de Les Dones de Negre 1, 08930, Sant Adri   de Bes  s, Barcelona, Spain Centre for Energy and Thermal Sciences of Lyon (CETHIL), CNRS-INS   Lyon-UCBL, Villeurbanne, France Catalan Institution for Research and Advanced Studies (ICREA), Passeig Llu  s Companys 23, 08010, Barcelona, Spain

12:45 **Spatial Tracking of Li+ Concentration using a Selective Optode for In-Situ Measurements in Li-ion Batteries** **N.II.6**

Haydn Francis(a,b), Dr. Zachary Ruff (a,b), Dr. Zenon Toprakcioglu(a), Prof. Clare Grey (a,b), Prof. Hugo Bronstein(a,b,c)

a: Yusuf Hamied Department of Chemistry, University of Cambridge, Cambridge, UK, b: The Faraday Institution, Didcot, Oxford, UK, c: The Cavendish Laboratory, Department of Physics, University of Cambridge, Cambridge, UK

13:00 **Lunch Break**

Advanced Sensor Materials I : J. Adam

14:00 **Metals and Metal oxides based materials for CO₂ utilization and Gas Sensing Applications: DFT Simulations and Modeling** **N.III.1**
Abhishek Kumar Mishra, Kamal Kumar
University of Petroleum and Energy Studies (UPES)

14:45 **Synthesis, design and sensing behaviour analysis on Pt-Sn/C electrocatalyst using micro DMFC technology** **N.III.3**
MUTHURAJA SOUNDRAPANDIAN, GOVARDHAN.K, SUBRAMANIAM CHITTUR
KRISHNASWAMY

SCHOOL OF ELECTRONICS ENGINEERING, VIT, VELLORE, INDIA SCHOOL OF
ADVANCED SCIENCES, VIT, VELLORE, INDIA
15:00 **Polymerized Ionic Liquids for Wearable Gas Sensors Detecting ppb-Level Biomarkers** **N.III.4**
Sang-Joon Park, Jun-Young Jeon, Tae-Jun Ha
Department of Electronic Materials Engineering, Kwangwoon University, Seoul
01897, Republic of Korea

15:15 **Rhombic magnetoelastic sensors combined with MOF active layers: A potential tool for VOCs sensing** **N.III.5**
Paula González^{1,2}, Roberto Fernandez³, María Isabel Arriortua³, Ana Catarina Lopes²

¹Phil and Penny Knight Campus for Accelerating Scientific Impact, University of Oregon, 1505 Franklin Boulevard, Eugene 97403, OR, USA ²Macromolecular Chemistry Research Group (LABQUIMAC), Dept. of Physical Chemistry. Faculty of Science and Technology, University of the Basque Country (UPV/EHU), Spain ³BCMaterials, Basque Center for Materials, Applications and Nanostructures, Bldg. Martina Casiano, UPV/EHU Science Park, Barrio Sarriena s/n, 48940 Leioa, Spain

15:30 **Coffee Break**

N.Advances in Plasmonic Materials I : F. Ruffino

16:00 **Plasmon-enhanced solar cells**

N.IV.1

Isodiana Crupi¹, Seweryn Morawiec² and Manuel J. Mendes³

¹ Engineering Department, University of Palermo, Viale delle Scienze, Ed. 9, I-90128 Palermo, Italy ² Institute of Physics, Faculty of Physics, Astronomy and Informatics, Nicolaus Copernicus University, ul. Grudziadzka 5, 87-100 Torun, Poland ³ CENIMAT-i3N, Faculdade de Ci ncias e Tecnologia, Universidade NOVA de Lisboa and CEMOP/ UNINOVA, Caparica, Portugal

16:30 **Plasmon resonances in silicon quantum wires**

N.IV.2

Giovanni Borgh, Antonino La Magna, Giovanni Mannino, Alireza Shabani, Salvatore Patan , Jost Adam, Rosaria A. Puglisi

Department of Mathematics and Computer Science, Physics and Earth Science (MIFT), University of Messina, Viale F. Stagno d Alcontres, 31, 98166 Messina, Italy, SDU Centre for Photonics Engineering University of Southern Denmark (SDU) Campusvej 55, 5230 Odense-M, Denmark, Institute for Microelectronics and Microsystems (IMM), National Research Council (CNR), Strada Ottava 5, Zona Industriale, 95121 Catania, Italy.

16:45 **Si/metal nanostructures made with metal assisted chemical etching for analytes detection by Plasmon-Enhanced Photoluminescence**

N.IV.3

Ioannis Kochylas, Anastasios Dimitriou, Lampros Patsiouras, Maria-Athina Apostolaki, Georgia Geka, Anastasia Kanioura, Panagiota Petrou, Nikolaos Papanikolaou, Vlassis Likodimos, Spiros Gardelis

Section of Condensed Matter Physics, Department of Physics, National and Kapodistrian University of Athens, Panepistimiopolis, 15 784, Greece, Institute of Nanoscience and Nanotechnology, National Center for Scientific Research â  Demokritosâ  , 15341 Agia Paraskevi, Athens, Greece, Institute of Nuclear & Radiological Sciences & Technology, Safety & Energy, National Center for Scientific Research â  Demokritosâ  , 15341 Agia Paraskevi, Athens, Greece

- 17:00 **Plasmon-enhanced optomechanical coupling in gold nanorod-polymer nanocomposites.** **N.IV.4**
 Thomas Vasileiadis [1,2], Adnane Noual [3], Yuchen Wang [4], Bartłomiej Graczykowski [1,2], Bahram Djafari-Rouhani [5], Shu Yang [4], George Fytas [2].

[1] Faculty of Physics, Adam Mickiewicz University, Uniwersytetu Poznańskiego 2, 61-614 Poznań, Poland. [2] Max Planck Institute for Polymer Research, Ackermannweg 10, 55128 Mainz, Germany. [3] LPMR, D partement de Physique, Facult  des Sciences, Universit  Mohammed Premier, Oujda, 60000, Morocco. [4] Department of Materials Science and Engineering, University of Pennsylvania, 3231 Walnut Street, Philadelphia, 19104, PA, United States. [5] IEMN, UMR-CNRS 8520, D partement de Physique, Universit  de Lille, Villeneuve d'Ascq, 59655, France.

Symposium N - Poster Session : B. Sanyal, F. Ruffino, S. Sharma, J. Adam

- 17:30 **Activation of wetting of non-metallic materials with metallic solders directly during soldering by applying capillary-active met** **N.P.5**
 Zhuravlev V.S., Stetsyuk T.V.

Frantsevich Institute for Problems of Materials Science of NAS of Ukraine

- 17:30 **Asymmetric bipolar sputtering of black titanium dioxide thin films** **N.P.6**
 Dennis Berends, Patrick Schwager, Kai Gehrke, Martin Vehse

German Aerospace Center (DLR) Institute of Networked Energy Systems

- 17:30 **Eco-friendly fabrication of colorimetric textile sensors by UV-induced photografting** **N.P.7**
 Young Ki Park, Jung Jin Lee, Woosung Lee

Advanced Textile R&D Department, Korea Institute of Industrial Technology (KITECH), Ansan 15588, Korea, Department of Fiber System Engineering, Dankook University, Yongin 16890, Korea

- 17:30 **Exploring Amine-Based Polymers Chemiresistive Behaviour for Designing a Flexible CO2 Sensor** **N.P.8**
 Zahra Shahrabaki, Professor Fariba Dehghani

School of Chemical and Biomolecular Engineering, The University of Sydney,
Sydney, NSW 2006, Australia

17:30 **Probing the Dielectric Function of Two-Dimensional Tungsten
Disulfide in Homo- and Heterobilayer Stacking**

N.P.9

Ermes Peci, Michele Magnozzi, Lorenzo Ramazzo, Marzia Ferrera, Domenica
Convertino, Simona Pace, Giorgio Orlandini, Apoorva Sharma, Ilya
Milekhin, Georgeta Salvan, Camilla Coletti, Dietrich R.T. Zahn, Francesco
Bisio, Maurizio Canepa

OptMatLab, Dipartimento di Fisica, Università di Genova, via Dodecaneso 33,
16146 Genova, Italy, OptMatLab, Dipartimento di Fisica, Università di Genova,
via Dodecaneso 33, 16146 Genova, Italy and INFN, Sezione di Genova, via
Dodecaneso 33, 16146 Genova, Italy, OptMatLab, Dipartimento di Fisica,
Università di Genova, via Dodecaneso 33, 16146 Genova, Italy, OptMatLab,
Dipartimento di Fisica, Università di Genova, via Dodecaneso 33, 16146
Genova, Italy, Center for Nanotechnology Innovation IIT@NEST, Piazza San
Silvestro 12, 56127 Pisa, Italy and Graphene Labs, Istituto Italiano di
Tecnologia, Via Morego 30, 16163 Genova, Italy, Center for Nanotechnology
Innovation IIT@NEST, Piazza San Silvestro 12, 56127 Pisa, Italy and Graphene
Labs, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy,
Center for Nanotechnology Innovation IIT@NEST, Piazza San Silvestro 12,
56127 Pisa, Physics Department, Technische Universität Chemnitz,
Reichenhainer Straße 70, 09126 Chemnitz, Germany, Physics Department,
Technische Universität Chemnitz, Reichenhainer Straße 70, 09126 Chemnitz,
Germany and Center for Materials, Architectures, and Integration of
Nanomembranes (MAIN), Rosenbergstraße 6, 09126 Chemnitz, Germany,
Physics Department, Technische Universität Chemnitz, Reichenhainer Straße
70, 09126 Chemnitz, Germany, Center for Nanotechnology Innovation
IIT@NEST, Piazza San Silvestro 12, 56127 Pisa, Italy and Graphene Labs,
Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy, Physics
Department, Technische Universität Chemnitz, Reichenhainer Straße 70,
09126 Chemnitz, Germany, CNR-SPIN, corso Perrone 24, 16152 Genova, Italy,
OptMatLab, Dipartimento di Fisica, Università di Genova, via Dodecaneso 33,
16146 Genova, Italy.

17:30 **Localized Surface Plasmon Resonance Shift of Biosynthesized and
Functionalized Gold Nanoparticle Systems for Ion Sensing**

N.P.10

Ricky Kristan M. Raguindin, Candy C. Mercado

Department of Mining, Metallurgical, and Materials Engineering, University of the Philippines Diliman

17:30 **Characterization of aluminum doped zinc oxide as support for a methanol synthesis catalyst** **N.P.11**

Dr. Ulrich SchÄrmann, Benjamin Mockenhaupt, Dr. Sebastian Mangelsen, Prof. Dr. Lorenz Kienle, Prof. Dr. Malte Behrens

Ulrich SchÄrmann, Institute of Materials Science, Kiel University, Kaiserstrae 2, 24143 Kiel, Germany, Benjamin Mockenhaupt, Institute of Inorganic Chemistry, Kiel University, Max-Eyth-Str. 2, 24118 Kiel, Germany, Sebastian Mangelsen, Institute of Inorganic Chemistry, Kiel University, Max-Eyth-Str. 2, 24118 Kiel, Germany, Lorenz Kienle, Institute of Materials Science, Kiel University, Kaiserstrae 2, 24143 Kiel, Germany, Malte Behrens, Institute of Inorganic Chemistry, Kiel University, Max-Eyth-Str. 2, 24118 Kiel, Germany

17:30 **Quantitative analysis of substrate constraint effect on thermodynamics of Pd-H system** **N.P.12**

Soomin Lee, Gwangmook Kim, Wooyoung Lee

Soomin Lee, Gwangmook Kim, Wooyoung Lee, Department of Material Science and Engineering, Yonsei University, 50 Yonsei-ro, Seoul 03722, Republic of Korea Gwangmook Kim, KIURI Institute, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of Korea

17:30 **Performance analysis of GaAsBi/InGaAs heterostructure for III-V multi-junction solar cells** **N.P.13**

T. Paulauskas, V. PaÄebutas, J. Devenson, R. Kondrotas, A. Krotkus
Center for Physical Sciences and Technology, SaulÄtekio al. 3, Vilnius 10257, Lithuania

17:30 **Resistive sensing stimuli responsive lanthanide-based polymeric hydrogels with tunable luminescence and fast self-recovery.** **N.P.14**

Prachishree Panda, Rajat K Das
Senior research fellow, Assistant Professor

17:30 **Highly Sensitive and Reversible Hydrogen Sensor Based on Parallel Resistance Circuit Model** **N.P.15**

17:30 **Jinkyong Jeong1), Hyun-Sook Lee2), Wooyoung Lee2),?** **N.P.15**

**1)Department of Vehicle Convergence Engineering, Yonsei University,
50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of Korea**

**2)Department of Materials Science and Engineering, Yonsei
University, 50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of**

17:30 **Korea** **N.P.15**

17:30 **Characterization of expendable salt-core material for advanced
manufacturing of one block cooling parts used in green vehicles** **N.P.16**

Min-Seok Jeon 1), Jae-Hoon Lee 1), Su-Bin Heo1), Dong-Gyun Kim 2), Gi-Won
Hong 2)

1) Korea Testing Laboratory 2) Castman Co. Ltd.

17:30 **Investigation of ZnO nanobrushes by self-patterned H₂-C₂H₂ plasma
etching for sensing applications** **N.P.17**

Niklas Kohlmann, Luka Hansen, Cristian Lupan, Ulrich SchÄlrmann, Armin
Reimers, Fabian SchÄl'tt, Rainer Adelung, Holger Kersten, Lorenz Kienle

Institute for Materials Science, Kiel University, Germany, Institute of
Experimental and Applied Physics, Kiel University, Germany, Center for
Nanotechnology and Nanosensors, Department of Microelectronics and
Biomedical Engineering, Technical University of Moldova, Moldova, Institute for
Materials Science, Kiel University, Germany, Institute for Materials Science, Kiel
University, Germany, Institute for Materials Science, Kiel University, Germany,
nstitute of Experimental and Applied Physics, Kiel University, Germany, nstitute
for Materials Science, Kiel University, Germany

17:30 **Modelling and Simulation of the Magnetostriction Effect in a Magneto-
sensitive Material** **N.P.18**

Nathalie Saouli [1], Marc Hayoun [1], Laurence Bodelot [2], Hichem Dammak
[3]

[1] Laboratoire des Solides Irradiés (LSI), Institut Polytechnique de Paris, CEA/DRF/IRAMIS, CNRS, Ecole polytechnique, Route de Saclay, 91128 Palaiseau, France [2] Laboratoire de Mécanique des Solides, Institut Polytechnique de Paris, CNRS, Ecole polytechnique, Route de Saclay, 91128 Palaiseau, France [3] Laboratoire Structures Propriétés et Modélisation des Solides, CentraleSupélec, CNRS, Université Paris-Saclay, F 91190 Gif-sur-Yvette, France

17:30 **Redox-active porous materials for CO₂ capture and conversion** **N.P.19**
Ulzhalgas Karatayeva, Prof. Charl F.J. Faul

University of Bristol, School of Chemistry, Bristol, United Kingdom

17:30 **Fundamental study for the mechanism of proton conduction in Ba₅Er₂Al₂ZrO₁₃ with intrinsically oxygen-deficient layers** **N.P.20**

Yong YOUN, Hye-Sung KIM
Korea Institute of Energy Research

17:30 **Electrochemical self-assembly of CuSCN / Neutral Red hybrid thin film for CO₂ reduction catalyst** **N.P.21**

Atsuhiko Ueno¹, Yuki Tsuda², Tensho Nakamura¹, Tsukasa Yoshida¹
1: Yamagata University 2: National Institute of Advanced Industrial Science and Technology

17:30 **Many-body modeling of 2D materials-based van der Waals heterostructures** **N.P.22**

Nikola Macháček¹, František Karlický²
Department of Physics, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic

17:30 **Reliable Computation of High Entropy, Mixed Transition Metal Oxide Cathode Materials** **N.P.23**

Yin-Ying Ting, Payam Kaghazchi, Piotr M. Kowalski
Theory and Computation of Energy Materials (IEK-13), Institute of Energy and Climate Research, Forschungszentrum Jülich, Wilhelm-Johnen-Straße, 52425 Jülich, Germany Chair of Theory and Computation of Energy Materials, Faculty of Georesources and Materials Engineering, RWTH Aachen University, 52062 Aachen, Germany, Materials Synthesis and Processing (IEK-1), Institute of Energy and Climate Research, Forschungszentrum Jülich, Wilhelm-Johnen-Straße, 52425 Jülich, Germany, Theory and Computation of Energy Materials

(IEK-13), Institute of Energy and Climate Research, Forschungszentrum JÄLlich, Wilhelm-Johnen-StraÄze, 52425 JÄLlich, Germany,

- 17:30 **Geometry, thermodynamics, polarization and electronic properties of the BaTiO3/hematite interface from first principles** **N.P.24**
Jorge Ontaneda, Keith T. Butler, Joe Briscoe

Jorge Ontaneda and Joe Briscoe: School of Engineering and Materials Science and Materials Research Institute, Queen Mary University of London, Mile End Road, London E1 4NS, United Kingdom , Keith T. Butler: Scientific Machine Learning Research Group, Scientific Computing Department, Rutherford Appleton Laboratory, Science and Technology Facilities Council, Didcot OX11 0DQ, United Kingdom

- 17:30 **Self-assembled phenolphthalein functionalized zincite doped silica-anatase nanocomposite as fast responsive optical pH sensor** **N.P.25**
Shumaila Islam , Adil Alshoaibi

Al Bilad Bank Scholarly Chair for Food Security in Saudi Arabia, The Deanship of Scientific Research, The Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Al Ahsa, Saudi Arabia

- 17:30 **Reactivity order of transition metal loaded 2D organic frameworks towards CO2 reduction reaction** **N.P.26**
Debolina Misra

Department of Physics, Indian Institute of Information Technology Design and Manufacturing Kancheepuram, Chennai, 600127, India

- 17:30 **Dynamic metal-ligand interaction based multistimuli responsive tough hydrogel for sensing applications** **N.P.27**
Ashis Ghosh, Rajat kumar Das
Research scholar, Assistant professor

- 17:30 **Fabrication of metal-organic framework-based fabric for hazardous gas adsorption** **N.P.28**
Lee Heedong, Yoo Namkyung, Kim Donghun, Lee Woosung

Advanced Textile R&D Department, Korea Institute of Industrial Technology (KITECH), Ansan 15588, Korea

17:30 **Depletion layer role in Multi-Layer Optical Modeling of Metal Oxide Nanocrystals** **N.P.30**

Nicolă Petrini [1,2], Michele Ghini [1], Nicola Curreli [1], Ilka Kriegel [1]

[1]: Functional Nanosystems, Istituto Italiano di Tecnologia (IIT), via Morego 30, 16163 Genova, Italy, [2]: Dipartimento di Fisica, Università degli Studi di Genova, Via Dodecaneso 33, 16146, Genova, Italy

17:30 **Photo-Induced electron accumulation in metal oxide nanocrystals for energy conversion and storage** **N.P.29**

Andrea Camellini, Michele Ghini, Andrea Rubino, Luca Rebecchi, Ilka Kriegel
Functional Nanosystems, Istituto Italiano di Tecnologia (IIT), via Morego 30, 16163, Genova, Italy

TUESDAY, 20 SEPTEMBER 2022

Advances in Electronic, Spintronic and Photonic Materials : J. Adam

9:00 **Silicon doping by using carbon-free liquid solutions** **N.VI.1**

Rosaria A. Puglisi

Istituto per la Microelettronica e Microsistemi (IMM), Consiglio Nazionale delle Ricerche (CNR), Catania, Italy

9:30 **How Are Superconcentrated LiTFSI–EmimTFSI Hybrid Aqueous Electrolytes Different from Water-in-Salt Electrolytes?** **N.VI.2**

H. K. Kashyap*

Department of Chemistry, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India

10:00 **Fabrication of air-stable bio-protonic devices for electronic control of H⁺ current across Phospholipid membranes** **N.VI.3**

Riya Sadhukhan, Prof. Dipak Kumar Goswami

Department of Physics, IIT Kharagpur, Department of Physics, IIT Kharagpur

10:15 **Platinum palladium and bimetallic Pt-Pd nanoparticles synthesized by pulsed laser ablation for electro-sorption of hydrogen in alkaline electrolyte** **N.VI.4**

Antonino Scandurra (1,2), Valentina Iacono (1,2), Maria Censabella (1,2), Antonino Gulino (3,4), Maria Grazia Grimaldi (1,2), Francesco Ruffino (1,2)

1) Department of Physics and Astronomy "Ettore Majorana", University of Catania, via Santa Sofia 64, 95123 Catania, Italy. 2) Institute for Microelectronics and Microsystems of National Research Council of Italy (CNR-IMM), via Santa Sofia 64, 95123 Catania, Italy. 3) Department of Chemical Sciences, University of Catania, Viale Andrea Doria 6, 95123 Catania, Italy. 4) National Interuniversity Consortium of Materials Science and Technology, Research Unit of the University of Catania (INSTM-UdR of Catania), Viale Andrea Doria 8, 95125 Catania, Italy.

10:30 **Coffee Break**

Advanced Catalytic Materials I : F. Ruffino

11:30 **The active surface structure of SnO₂ catalysts for CO₂ reduction revealed by ab initio simulations** **N.VII.1**

Clara Salvini, Michele Re Fiorentin, Francesca Risplendi, Giancarlo Cicero

Clara Salvini: Center for Sustainable Future Technologies, Istituto Italiano di Tecnologia, Torino 10144, Italy, Department of Applied Science and Technology, Politecnico di Torino, Torino 10129, Italy, Michele Re Fiorentin: Center for Sustainable Future Technologies, Istituto Italiano di Tecnologia, Torino 10144, Italy, Francesca Risplendi: Department of Applied Science and Technology, Politecnico di Torino, Torino 10129, Italy, Giancarlo Cicero: Department of Applied Science and Technology, Politecnico di Torino, Torino 10129, Italy.

11:45 **Hydrogen Evolution Reaction catalysed by low-cost synthesized WO₃ nanorods** **N.VII.2**

G. Mineo^{1,2}, M. Scuderi³, E. Bruno^{1,2}, S. Mirabella^{1,2}

1 Dipartimento di Fisica e Astronomia "Ettore Majorana", Università degli Studi di Catania, via S. Sofia 64, 95123 Catania, Italy, 2 CNR-IMM (Università di Catania), via S. Sofia 64, 95123 Catania, Italy, 3 IMM-CNR, VIII strada 5, 95121 Catania, Italy,

- Low-cost and high throughput synthesis of ZnO nanostars as catalysts for Hydrogen Evolution Reaction.** **N.VII.3**
 12:00 G. Di Mari (1,2), L. Bruno (1,2), G. Malandrino (3), G. FranzÄ (2), S. Mirabella (1,2), E. Bruno (1,2)
 (1) Dipartimento di Fisica e Astronomia â€E. Majoranaâ€™, UniversitÄ degli Studi di Catania, Via S. Sofia 64, I-95123, Catania, Italy, (2) CNR-IMM, Via S. Sofia 64, I-95123, Catania, Italy. (3) Dipartimento di Scienze Chimiche, UniversitÄ degli Studi di Catania, INSTM Udr Catania, Viale A. Doria 6, I-95125, Catania, Italy
- Highly fluorinated g-C3N4 for photocatalytic applications** **N.VII.4**
 12:15 Arianit Gashi 1-2, Aissam Ait Lhouciane 3, Nicolas Batisse 3, Guillaume Monier 4, Roman Marsalek 2, Julien Parmentier 1 , Pierre Bonnet 3
 1- Institut de Science des MatÃ©riaux de Mulhouse (IS2M), UniversitÄ© de Strasbourg, UniversitÄ© de Haute-Alsace, 15 rue Jean Starcky, BP 2488, 68057 Mulhouse Cedex, France , 2- Department of Chemistry University of Ostrava 30. Dubna 22, Ostrava, 701 03, Czech Republic , 3 - UniversitÄ© Clermont Auvergne, Institut de Chimie de Clermont-Ferrand (ICCF), 24 Avenue Blaise Pascal, 63178 Aubiere, France , 4 - UniversitÄ© Clermont Auvergne, CNRS, Clermont Auvergne INP, Institut Pascal (IP), F-63000 Clermont-Ferrand, France
- Modelling enantiomeric catalysts: enantioselective hydrogenation of methyl acetoacetate over Ni surfaces** **N.VII.5**
 12:30 Jorge Ontaneda, Ricardo Grau-Crespo, Georg Held
 Jorge Ontaneda: School of Engineering and Materials Science and Materials Research Institute, Queen Mary University of London, Mile End Road, London E1 4NS, UK, Ricardo Grau-Crespo: Department of Chemistry, University of Reading, Whiteknights, Reading RG6 6AD, UK, Georg Held: Diamond Light Source, Harwell Science and Innovation Campus, Didcot OX11 0QX, UK
- Modeling catalyst materials for CO2 reduction: from metal nanoparticles to halide perovskites** **N.VII.6**
 12:45 Rafaela Maria Giappa, Apostolos Pantousas, Constantinos C. Stoumpos, George Kopidakis, Ioannis N. Remediakis

Department of Materials Science and Technology, University of Crete, Greece ,
 Department of Materials Science and Technology, University of Crete, Greece ,
 Department of Materials Science and Technology, University of Crete, Greece ,
 Department of Materials Science and Technology, University of Crete, Greece
 and Institute of Electronic Structure and Laser, Foundation for Research and
 Technology-Hellas (IESL-FORTH) , Department of Materials Science and
 Technology, University of Crete, Greece and Institute of Electronic Structure
 and Laser, Foundation for Research and Technology-Hellas (IESL-FORTH)

13:00 **Lunch Break**

Advances in 2D and Pseudo-2D Materials : B. Sanyal

14:00 **Spectroscopy and transport in (defected) 2D materials** **N.X.1**

P. Melo (1), Z. Zanolli (1), F. Libbi (2), N. Marzari (2), M. Verstraete (3)
 [1]: Utrecht University, [2]: EPFL, [3]: University of Liege

14:30 **An Emerging Janus Monolayers Ge₂XY (X/Y=S/Se/Te): Prospective Materials to Achieve the Goal of Carbon-Neutrality** **N.X.2**

Anup Shrivastava, Shivani Saini, Sanjai Singh
 Computational Nano-Materials Research Lab (CNMRL), Indian Institute of
 Information Technology-Allahabad, India

15:00 **Imidazole additives in 2D halide perovskites: Impacts of -CN versus -CH₃ substituents on crystal growth by phase buffering** **N.X.3**

Kaibo Zheng, Ziqi Liang

Department of Chemistry, Technical University of Denmark, DK-2800 Kongens
 Lyngby, Denmark, Department of Materials Science, Fudan University,
 Shanghai 200433, China

15:15 **Interfacial dynamic self-assembly system composed of nanoparticles decorated with poly(N-isopropyl acrylamide) (PNIPAM)** **N.X.4**

Rafał, Zbonikowski, Michalina Iwan, Jan Paczesny
 Institute of Physical Chemistry Polish Academy of Sciences, ul. Kasprzaka 44/52
 01-224 Warsaw

15:30 **Coffee Break**

Multi-physical Materials I : B. Sanyal

- 16:00 **Investigating strontium hexaferrite magnets using micromagnetic finite-element calculations** **N.X.5**
 Søren Peder Madsen
 Department of Mechanical and Production Engineering - Mechanics and Materials, Aarhus University, Denmark
- 16:30 **Opto-electro-mechanical properties of Al-doped Zinc Oxide** **N.IX.2**
 Alireza Shabani, Dike Issu, Neda Rahmani, Jost Adam
- 1Department of Mechanical and Electrical Engineering, University of Southern Denmark, DK-6400 Sønderborg, Denmark 2Computational Materials Group, SDU Center for Photonics Engineering, Mads Clausen Institute, University of Southern Denmark, DK-5320 Odense, Denmark, 2Computational Materials Group, SDU Center for Photonics Engineering, Mads Clausen Institute, University of Southern Denmark, DK-5320 Odense, Denmark, 1Department of Mechanical and Electrical Engineering, University of Southern Denmark, DK-6400 Sønderborg, Denmark 2Computational Materials Group, SDU Center for Photonics Engineering, Mads Clausen Institute, University of Southern Denmark, DK-5320 Odense, Denmark, 2Computational Materials Group, SDU Center for Photonics Engineering, Mads Clausen Institute, University of Southern Denmark, DK-5320 Odense, Denmark
- 16:45 **Nanocolumnar Ag₂Se thin films with superior mechanical properties and high room temperature thermoelectric performance** **N.IX.3**
 Jamal Ahmad Khan, Jitendra Pratap Singh
 Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India
- 17:00 **High-entropy alloys as supersilient soft magnetic materials in AC applications** **N.IX.4**
 M. Wencka, J. Dolinšek, D. Gačnik, A. Jelena, P. Koželja, J. Luzara, A. Medend, P. Priputene, S. Vrtnika
 Jožef Stefan Institute, Jamova 39, SI-1000 Ljubljana, Slovenia, Institute of Molecular Physics, Polish Academy of Sciences, Smoluchowskiego 17, PL-60-179 Poznań, Poland, University of Ljubljana, Faculty of Mathematics and Physics, Jadranska 19, SI-1000 Ljubljana, Slovenia, University of Ljubljana, Faculty of Chemistry and Chemical Technology, Večna pot 113, SI-1000 Ljubljana, Slovenia, Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava, Jána Bottu 2781/25, 917 24 Trnava, Slovak Republic
- 17:15 **Interfacial and tribological characteristics of MoS₂ on Ni under nanoindentation and nanoscratch** **N.IX.5**

Chia-Wei Huang, and Te-Hua Fang*

Department of Mechanical Engineering, National Kaohsiung University of Science and Technology, Kaohsiung 80778, Taiwan

- 17:30 **Modeling and kMC simulation to optimize nano-Si fabrication by AlSi d'-droplet quenching – a new reaction pathway to fabricate li** **N.IX.6**
D. Tucholski, K.-H. Heinig, H.-J. Engelmann
Helmholtz-Center Dresden-Rossendorf, Dresden, Germany
- 17:45 **Molecular Dynamics Study of Wetting-Dewetting of Model Carbon Material by Reline DES Nanodroplet** **N.IX.7**
A. Malik, H. S. Dhatarwal, H. K. Kashyap*
Department of Chemistry, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India
- 18:00 **Nanowire based Thermal Diode** **N.IX.8**

Yashpreet Kaur [1], M.Y. Swinkels [1], M. Camponovo [1], W. Kim [2], M.Lopez-Suarez [3], A. Fontcuberta i Morral [2], R. Rurali [3], I. Zardo [1]

[1] - Department of Physics, University of Basel, 4056 Basel, Switzerland [2] - Laboratory of Semiconductor Materials, Institute of Materials, Ecole Polytechnique Federale de Lausanne, 1015 Lausanne, Switzerland [3] - Institute de Ciencia de Materilas de Barcelona (ICMAB-CSIC), 08193 Bellaterra, Barcelona, Spain

WEDNESDAY, 21 SEPTMEBER 2022

Materials for Energy Conversion II : B. Sanyal

- 14:00 **Challenges in DFT-based Modeling of Materials for Energy Transition** **N.VIII.1**
Piotr M. Kowalski

Theory and Computation of Energy Materials (IEK-13), Institute of Energy and Climate Research, Forschungszentrum Juelich GmbH (Research Center Juelich), Wilhelm-Johnen-Straße, 52425 Juelich, Germany
- 14:30 **Green energy from direct electron transfer by Escherichia Coli** **N.VIII.2**
Sovanlal Mondal, Madhuchanda Banerjee, Suman Mandal, Ajoy Mandal, Dipak Kumar Goswami

School of Nano Science and Technology, IIT Kharagpur, Medinipur College, Medinipur, King Abdullah University of Science and Technology, Department of physics, IIT Kharagpur, Department of physics, IIT Kharagpur.

14:45 **Calculation of Voltage-Dependent Activation Energy of HCOOH and CO Pathways for CO₂ Electroreduction on Ag, Zn and Pb Electrodes** **N.VIII.3**

Clara Salvini, Robert Brevik, Michele Re Fiorentin, Francesca Risplendi, Giancarlo Cicero, Hannes J  nsson

Clara Salvini: Center for Sustainable Future Technologies, Istituto Italiano di Tecnologia, Torino 10144, Italy, Department of Applied Science and Technology, Politecnico di Torino, Torino 10129, Italy, Robert Brevik: Science Institute and Faculty of Physical Sciences, University of Iceland, 107 Reykjav  k, Iceland, Michele Re Fiorentin: Center for Sustainable Future Technologies, Istituto Italiano di Tecnologia, Torino 10144, Italy, Francesca Risplendi: Department of Applied Science and Technology, Politecnico di Torino, Torino 10129, Italy, Giancarlo Cicero: Department of Applied Science and Technology, Politecnico di Torino, Torino 10129, Italy, Hannes J  nsson: Science Institute and Faculty of Physical Sciences, University of Iceland, 107 Reykjav  k, Iceland, Department of Applied Physics, Aalto University, FI-00076 Espoo, Finland.

15:00 **Atomistic studies of surface and interface properties in lead-free halide perovskite semiconductor devices** **N.VIII.4**

Laurent PEDESSEAU (1), Pingping JIANG (1), Boubacar TRAORE (2), Mikael KEPENEKIAN (2), Claudine KATAN (2), George VOLONAKIS (2), and Jacky EVEN (1)

(1) Univ Rennes, INSA Rennes, CNRS, Institut FOTON - UMR 6082, F-35000 Rennes, France (2) Univ Rennes, ENSCR, INSA Rennes, CNRS, ISCR- UMR 6226, F-35000 Rennes, France

15:15 **A theoretical study of new lead-free double perovskite semiconductors for photovoltaic applications** **N.VIII.5**

Neda Rahmani, Alireza Shabani, and Jost Adam

1Department of Mechanical and Electrical Engineering, University of Southern Denmark, DK-6400 Sønderborg, Denmark 2Computational Materials Group, SDU Center for Photonics Engineering, Mads Clausen Institute, University of Southern Denmark, DK-5320 Odense, Denmark, 1Department of Mechanical and Electrical Engineering, University of Southern Denmark, DK-6400 Sønderborg, Denmark 2Computational Materials Group, SDU Center for Photonics Engineering, Mads Clausen Institute, University of Southern Denmark, DK-5320 Odense, Denmark, 2Computational Materials Group, SDU Center for Photonics Engineering, Mads Clausen Institute, University of Southern Denmark, DK-5320 Odense, Denmark

15:30 **Coffee Break**

Advanced Sensor Materials II : S. Sharma

16:00 **Detection of Air and Water pollutants using Two Dimensional Nanomaterials: Computational Insight** **N.XI.1**
Anurag Srivastava

Advanced Materials Research Group, Computational Nanoscience and Technology Lab, ABV-Indian Institute of Information Technology and Management, Gwalior (M.P.) 474010

16:30 **Surface functionalization of chalcogenide IR photonic sensor by means of polymer membrane devoted to water pollution** **N.XI.2**

Martin Vrazel¹, Marion Baillieul¹, Kada Boukerma³, Remi Courson³, Patrick Loulergue², Anthony Szymczyk², Abdelali Hammouti⁴, Loic Bodiou⁴, Joël Charrier⁴, Tomas Halenkovic¹, Marek Bouska¹, Petr Nemec¹, Virginie Nazabal^{2,1}

¹Department of Graphic Arts and Photophysics, Faculty of Chemical Technology, University of Pardubice, Studentska 573, 53210 Pardubice, Czech Republic, ²Univ Rennes 1, CNRS, ISCR - UMR6226, F-35000 Rennes, France, ³IFREMER, Laboratoire D'océanographie, Capteurs et Mesures, 29280 Plouzané, France, ⁴Univ Rennes 1, CNRS, Institut Foton - UMR 6082, F-22305 Lannion, France

16:45 **Modelling of a Portable, Laminar, Multi-Gas Sensing Chamber with Integrated Heater** **N.XI.3**
K Govardhan* & S Muthuraja

K Govardhan*, Department of Micro and NanoElectronics, School of Electronics Engineering, Vellore Institute of Technology, Vellore, Tamil Nadu, India S Muthuraja Department of Sensor and Biomedical Technology, School of Electronics Engineering, Vellore Institute of Technology, Vellore, Tamil Nadu, India

17:00 **Development of the data acquisition system for sensing the food spoilage** **N.XI.4**
Egit Musaev, Matteo Soprani, Emilio Sardini, Costantino de Angelis, Edoardo Cantu, Mauro Serpelloni, Camilla Baratto

CNR-INO, PRISM Lab, Via Branze 45, 25123 Brescia, Italy, Department of Information Engineering, University of Brescia, 25133 Brescia, Italy
17:15 **Hierarchically grown nanostructure for suppressing leaching in fiber optic chemical sensing** **N.XI.5**
Adil Alshoaibi , Shumaila Islam

Al Bilad Bank Scholarly Chair for Food Security in Saudi Arabia, The Deanship of Scientific Research, The Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Al Ahsa, Saudi Arabia

THURSDAY, 22 SEPTEMBER 2022

Materials for Energy Conversion III : S. Sharma

9:00 **FIRST PRINCIPLES MODELING OF MATERIALS AND PROCESSES IN DYE FUNCTIONALISED-METAL OXIDE INTERFACES FOR SOLAR ENERGY CONVERSION** **N.XII.1**
Mariachiara PASTORE

Laboratoire de Physique et Chimie Théoriques (LPCT), CNRS & Université de Lorraine, Boulevard des Aiguillettes, 54506 Nancy (France)

9:30 **Precised laser tailoring of the separated titania nanotubes toward unique photonic structure for energy conversion** **N.XII.2**
Katarzyna Grochowska

Laboratory of Functional Materials, Centre of Plasma and Laser Engineering, The Szwedzki Institute of Fluid-Flow Machinery, Polish Academy of Sciences Fiszerka 14 st., 80-231 Gdańsk, Poland

10:00 **The energetic role of dangling bond defects on InP photoelectrode surfaces at the electrochemical interface to water** **N.XII.3**

Dominik Moritz (a), Mohammad Amin Zare Pour (b), Azahel Ruiz (c), David Ostheimer (b), Agnieszka Paszuk (b), Bernhard Kaiser (a), Wolf Gero Schmidt (c), Thomas Hannappel (b), Jan Philipp Hofmann (a), Wolfram Jaegermann (a)

(a)Surface Science Laboratory, Department of Materials and Earth Sciences, Technical University of Darmstadt, 64287 Darmstadt, Germany, (b)Grundlagen von Energiematerialien, Technical University of Ilmenau, 98693 Ilmenau, Germany, (c)Theoretische Physik, Univ. Paderborn, 33095 Paderborn, Germany

10:15 **Kinetic Monte Carlo Simulation of exciton dynamics in organic non-fullerene acceptor solar cell materials** **N.XII.4**

Wenchao Yang, Safakath Karuthedath, Catherine S. P. de Castro, Julien Gorenflot, Frederic Laquai

King Abdullah University of Science and Technology (KAUST), KAUST Solar Center (KSC), Physical Sciences and Engineering Division (PSE), Material Science and Engineering Program (MSE), Thuwal 23955-6900, Kingdom of Saudi Arabia

10:30 **Composites of Bi₂MoO₆ with Clay-like Materials for Spontaneous Water Decontamination** **N.XII.5**

Sanjay Jatav,¹ Marcel Herber,¹ Hongxiao Xiang,¹ Junying Liu,¹ and Eric H. Hill^{1,2}

¹ Institute of Physical Chemistry, University of Hamburg, Hamburg 20146, Germany ² The Hamburg Centre for Ultrafast Imaging (CUI), Hamburg 22761, Germany

10:45 **Bridging manganese clusters and materials formation: Polymorphism control in manganese oxide nanoparticles in hydrothermal synth** **N.XII.6**

Nicolas P. L. Magnard¹, Andrea Kirsch¹, Olivia Aalling-Frederiksen¹, Baiyu Wang¹, Tobias M. Nielsen¹, Mikkel Juelsholt², Kirsten M. Å. Jensen¹

1. Department of Chemistry, University of Copenhagen, Copenhagen, Denmark
2. Currently affiliated to Departments of Materials and Chemistry, University of Oxford, Parks Road, Oxford OX1 3PH, UK

11:00 **Coffee Break**

Doped semiconductors and catalysis : F. Ruffino

12:00 **Fe and Cr codoped TiO₂ nanowires for water purification and self-cleaning applications** **N.XIII.1**

Federico Giuffrida 12, Lucia Calcagno 1, Giuliana Impellizzeri 2, Sergio Battiato 1 and Massimo Zimbone 2

1) Dipartimento di Fisica e Astronomia, University of Catania 2) CNR-IMM Catania University, Via S. Sofia, 64, 95124, Catania, Italy

12:15 **Diazonium-based molecular wiring of graphene leads to enhanced unidirectional photocurrent generation through p-doping effect** **N.XIII.2**

Margot Jacquet,a* Silvio Osella,b Ersan Harputlu,c Barbara PaŁys,d Monika Kaczmarek,b Ewa K. Nawrocka,e Adam A. Rajkiewicz,f Marcin Kalek,f PaweŁ, Piotr MichaŁowski,g Bartosz Trzaskowski,b Gokhan C. Unlu,h Wojciech Lisowski,i Marcin Pisarek,i Krzysztof Kazimierzuk,e Kasim Ocakoglu,c Agnieszka WiÅ™ckowskaj and Joanna Kargula*

a Solar Fuels Laboratory, Centre of New Technologies, University of Warsaw, Banacha 2C, 02-097 Warsaw, Poland. b Chemical and Biological Systems Simulation Lab, Centre of New Technologies, University of Warsaw, Banacha 2C, 02-097 Warsaw, Poland. c Department of Engineering Fundamental Sciences, Faculty of Engineering, Tarsus University, 33400, Tarsus, Turkey. d Faculty of Chemistry, University of Warsaw, Pasteur str. 1, 02-093 Warsaw, Poland. e Laboratory of NMR Spectroscopy, Centre of New Technologies, University of Warsaw, Banacha 2C, 02-097 Warsaw, Poland. f Laboratory of Chemical Synthesis Methodology, Centre of New Technologies, University of Warsaw, Banacha 2C, 02-097 Warsaw, Poland. g Łukaszewicz Research Network "Institute of Microelectronics and Photonics, Aleja Lotników 32/46, 02-668 Warsaw, Poland. h Department of Biomedical Engineering, Pamukkale University, TR-20070 Denizli, Turkey. i Institute of Physical Chemistry, Polish Academy of Science, 01-224, Warsaw, Poland. j Faculty of Chemistry, University of Warsaw, Pasteura 1, 02-093 Warsaw, Poland.

12:30 **Study of Au/PDA Nanoparticles Photodegradation Efficiency towards Rhodamine 6G: Effect of Polydopamine thickness** **N.XIII.3**

Daniel Aguilar-Ferrer, Igor Iatsunskyi, Sergio Moya, Mikhael Bechelany and Emerson Coy

Daniel Aguilar-Ferrer^{1,2}, Igor Iatsunskyi¹, Sergio Moya³, Mikhael Bechelany², Emerson Coy¹ ¹ NanoBioMedical Centre, Adam Mickiewicz University, Wszechnicy Piastowskiej 3, 61-614, Poznan, Poland. ² Institut Europeen des Membranes, IEM, UMR 5635, Univ Montpellier, ENSCM, CNRS, 34730 Montpellier, France ³ Centre for Cooperative Research in Biomaterials (CIC biomaGUNE), Basque Research and Technology Alliance (BRTA), Paseo Miramon 182 C, 20014 Donostia-San Sebastian, Spain

12:45 **The early stages of the Molecule Deposition Process During the Molecular Doping**

N.XIII.4

Mattia Pizzone ^{1,2}, Maria Grazia Grimaldi ², Antonino La Magna ¹, Neda Rahmani ³, Silvia Scalese ¹, Jost Adam ³, Rosaria A. Puglisi ¹.

¹ Istituto per la Microelettronica e Microsistemi (IMM), Consiglio Nazionale delle Ricerche (CNR), Catania, Italy, ² Dipartimento di Fisica e Astronomia “Ettore Majorana”, Universit  degli Studi di Catania, Italy, ³ SDU Centre for Photonics Engineering, University of Southern Denmark (SDU), Denmark.

13:00 **Lunch Break**

Advanced Characterization II : J. Adam

14:00 **Observation of hot electron driven photochemical reaction of steady-state NO₂ gas molecules by surface â€œenhanced Raman spectroscopy**

N.XIV.1

Chawki Awada*, Nagih Shaalan, Chahinez Dab, Francesco Ruffino

Department of Physics, College of Science, King Faisal University, P.O. Box: 400, Al  hsa 31982, Saudi Arabia. Department de biologie, chimie et g  ographie, Universit  du Qu  bec   Rimouski, 300 all  e des Ursulines, Rimouski (Qc), Canada, G5L 3A1, Canada Dipartimento di Fisica e Astronomia â  Ettore Majoranaâ  -Universit  di Catania and MATIS CNR-IMM, via S. Sofia 64, 95123 Catania, Italy

14:30 **Morphology, electrical and optical properties of Cu nanostructures embedded in TCOs: a comparison between dry and wet methods.**

N.XIV.2

Stefano Boscarino 1-2, Maria Censabella 1-2, Melanie Micali 1-2, Marco Russo¹,
Antonio Terrasi 1-2, Maria Grazia Grimaldi 1-2, Francesco Ruffino¹⁻²

1 Dipartimento di Fisica e Astronomia "Ettore Majorana" Università di
Catania, Via S. Sofia 64, 95123, Catania, Italy, 2 CNR-IMM, Via S. Sofia 64,
95123, Catania, Italy

14:45 **Singlet Fission in Pentacene Dimers: Coherent 2D Spectroscopy View** **N.XIV.3**

Haoqing Ning⁽¹⁾, Soham Mukherjee⁽²⁾, Donatas Zigmantas⁽³⁾, Andrew J
Musser⁽²⁾, Artem A. Bakulin⁽¹⁾

(1) Department of Chemistry and Centre for Processable Electronics, Imperial
College London, London W12 0BZ, United Kingdom (2) Department of
Chemistry and Chemical Biology, Cornell University, Ithaca, NY 14850, USA (3)
Donatas Zigmantas - Division of Chemical Physics and NanoLund, Lund
University, P.O. Box 124, 22100 Lund, Sweden

15:00 **Study on Temperature and Strain Dependent Orientational Behavior
of Mesogen in Liquid Crystalline Elastomers Using WAXS** **N.XIV.4**

Hye-Ji Kim, Jin-Su Kim, Seung-Yeol Jeon, Woong-Ryeol Yu

Department of Materials Science and Engineering, Seoul National University,
Department of Materials Science and Engineering, Seoul National University,
Korea Institute of Science and Technology (KIST), Department of Materials
Science and Engineering, Seoul National University

15:15 **Low temperature detection of nitric oxide (NO) by CuO nanoparticles
synthesized by pulsed laser ablation in liquid** **N.XIV.5**

Censabella M. (1,2), Iacono V. (1,2,3), Scandurra A. (1,2), Moulane K. (4), Neri
G. (4), Ruffino F. (1,2,3), Mirabella S. (1,2,3)

(1) Dipartimento di Fisica e Astronomia "Ettore Majorana" Università di
Catania, via S. Sofia 64, 95123 Catania, Italy, (2) CNR-IMM (Catania
Università), via S. Sofia 64, 95123 Catania, Italy, (3) CSFNSM - Centro
Siciliano di Fisica Nucleare e Struttura della Materia, Via S. Sofia 64 95123
Catania, (4) Department of Engineering, University of Messina and INSTM
Research Unity, C.da Di Dio, I-98166, Messina, Italy,

15:30 **Coffee Break**

16:30 **Theoretical design and investigation of novel fluorophore-protein systems for applications in sustainable bio-LEDs** **N.XV.2**

G. Biffi, S. Sansotta, H. Lechner, S. Ferrara, A. L. Cortajarena, C. Barolo, G. Oberdorfer, R. Costa, P. B. Coto

Consejo Superior de Investigaciones Cientificas, Centro de Fisica de Materiales (Donostia-San Sebastian, Spain), Consejo Superior de Investigaciones Cientificas, Centro de Fisica de Materiales (Donostia-San Sebastian, Spain), Graz University of Technology (Graz, Austria), Technische Universität München (Munich, Germany), CICbiomaGUNE (Donostia-San Sebastian, Spain), Università di Torino (Turin, Italy), Graz University of Technology (Graz, Austria), Technische Universität München (Munich, Germany), Consejo Superior de Investigaciones Cientificas, Centro de Fisica de Materiales, Donostia International Physics Centre (Donostia-San Sebastian, Spain)

16:45 **Shape-controlled self-assembly of light-powered microrobots into ordered microchains for cells transport and water remediation** **N.XV.3**

Xia Peng, Mario Urso, Martina Ussia, Martin Pumera*

1 Future Energy and Innovation Laboratory, Central European Institute of Technology, Brno University of Technology, Purkynova 123, 61200, Brno, Czech Republic 2 Department of Medical Research, China Medical University Hospital, China Medical University, No. 91 Hsueh-Shih Road, Taichung, Taiwan, ROC 3 Department of Chemical and Biomolecular Engineering, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, 03722, Seoul, Korea

17:15 **On the Response Speed of Narrowband Organic Optical Upconversion Devices** **N.XV.5**

Wei-Hsu Hu(1,2), Camilla Vael(2,3), Matthias Diethelm(1,2), Karen Strassel(1,2), Surendra B. Anantharaman(1,2), Abdessalem Aribia(4), Marco Cremona(5), Sandra Jenatsch(3), Frank Nöllesch(1,2), Roland Hany(1)
1. Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Functional Polymers, 8600 Dübendorf, Switzerland, 2. EPFL, Institute of Materials Science and Engineering, Ecole Polytechnique Fédérale de Lausanne, Station 12, 1015 Lausanne, Switzerland, 3. Fluxim AG, Katharina-Sulzer-Platz 2, 8400 Winterthur, Switzerland, 4. Empa, Swiss Federal Laboratories for Materials Science and Technology, Thin Films and Photovoltaics, 8600 Dübendorf, Switzerland, 5. PUC-Rio, Pontifical Catholic

University of Rio de Janeiro, Physics Department, Optoelectronic Molecular Laboratory, 224543-970, Rio de Janeiro, Brazil,

17:30 **Multi-organic dyes-immobilised zincite decorated silica-titania nanocomposite: A study on atomic site structural changes for pH** **N.XV.6**
Adil Alshoaibi a, , Shumaila Islam

Department of Physics, College of Science, King Faisal University, Al-Hassa, P.O. Box 400, Hofuf 31982, Saudi Arabia



Symposium 0

Sessions: Room 206 | Main Building
Poster Session: Small Hall | Main Building

Materials for a sustainable transition:

Circular materials and resource chemistry

Symposium Organizers: **Andrea GASSMANN** Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKS Germany

Eckhard WEIDNER Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT Germany

Elsa OLIVETTI MIT, Department of Materials Science and engineering USA

Enrico BERNARDO University of Padova Italy

Symposium O Program

MONDAY, 19 SEPTEMBER 2022

(Bio)Polymers - Synthesis and Degradability : Andrea Gassmann

9:00 **Selective degradation of synthetic polymers fibers through enzymes immobilized on nanocarriers** **O.01.1**

Sanjay Mathur

Institute of Inorganic Chemistry, University of Cologne, Greinstr. 6, 50939 Cologne, Germany

9:30 **Study of the Degradation of Biobased Plastic after Stress Tests in Water** **O.01.2**

Gina Ambrosio^{1,*}, Guido Faglia^{1,2}, Stefano Tagliabue³ and Camilla Baratto¹

¹ CNR-INO, PRISM Lab, Via Branze 45, 25123 Brescia, Italy, ² Department of Information Engineering, University of Brescia, 25133 Brescia, Italy, ³ Corapack S.r.l., 22040 Brenna, Italy, * e-mail: gina.ambrosio@ino.cnr.it,

9:45 **Fabrication of Renewable and Active CO₂-derived Biocomposites by Green and Sustainable Water-based Process** **O.01.3**

Thi Nga Tran,^{1,*} Michael Morris,^{2,3} Maurice Collins¹

¹ Faculty of Science and Engineering, Bernal Institute, University of Limerick, Limerick V94 T9PX, Ireland, ² Advanced Material and BioEngineering Research Centre (AMBER), Trinity College Dublin, The University of Dublin, Ireland, ³ School of Chemistry, Trinity College Dublin, The University of Dublin, Dublin 2, Ireland

10:00 **Development of a novel toolbox for fabrication of protein materials** **O.01.4**
Niclas Solin

Division of Electronic and Photonic Materials, Biomolecular and Organic Electronics, Department of Physics, Chemistry, and Biology, Linköping University, Linköping, 581 83, Sweden

10:15 **Coffee break**

Energy Materials for Circular Economy : Marc Widenmeyer

11:00 Monolithic 2-Terminal Perovskite Silicon Tandem Solar Cells

O.02.1

Patricia S. C. Schulze 1, Åzde Ş,. Kabaklı, 1, Minasadat Heydarian 1,2, Oussama Er-Raji 1,2, Maryamsadat Heydarian 1,2, Raphael Efinger 1, Kaitlyn McMullin1, Oliver Schultz-Wittmann 1, Christoph Messmer 1,2, Alexander J. Bett 1, Oliver Fischer 1,2, Leonard Tutsch 1, Denis Erath 1, Sebastian Pingel 1, Thibaud Hatt 1, Martin Bivour 1, Martin C. Schubert 1, Jan Christoph Goldschmidt 1,3, Martin Hermle1, Stefan W. Glunz 1,2

1 Fraunhofer Institute for Solar Energy Systems ISE, 79110 Freiburg, Germany, 2 University of Freiburg, Germany, 79110 Freiburg, Germany, 3 University of Marburg, Germany, 35037 Marburg, Germany.

11:30 Multiple functional recycling of Nd-Fe-B permanent magnets and the effect on different material properties

O.02.2

Mario SchÄ¶nfeltdt, Urban Rohrmann, Philipp Schreyer, Mahmudul Hasan, Konrad Opelt, JÄ¶rgen Gassmann, Anke Weidenkaff, Oliver Gutfleisch
SchÄ¶nfeltdt, Rohrmann, Schreyer, Hasan, Opelt, Gassmann, Weidenkaff: Fraunhofer IWKS, Fraunhofer Research Institution for Materials Recycling and Resource Strategies, Aschaffenburg Str. 121, 63457 Hanau, Germany SchÄ¶nfeltdt, Schreyer, Hasan, Opelt, Weidenkaff, Gutfleisch: TU Darmstadt, Department of Materials- and Geosciences, Alarich-Weiss-Str. 16, 64287 Darmstadt, Germany

11:45 Compositional and Structural Disorder as Enablers for the Circular Economy

O.02.3

Emanuel Ionescu1,2, Teppala D. Teja2, Ruijan Yuan2, Xingxing Xiao2, JÄ¶rgen Gassmann1, Anke Weidenkaff1,2

1Fraunhofer IWKS, Brentanostr. 2a, D-63755 Alzenau, Germany, 2Technische Universität Darmstadt, Institute for Materials Science, Alarich-Weiss-StraÙe 2, D-64287 Darmstadt, Germany

12:00 Supraparticles for Sustainability

O.02.4

Susanne Wintzheimer, Karl Mandel, and The Supraparticle Group
S.W.: Department of Chemistry and Pharmacy, Inorganic Chemistry, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), EgerlandstraÙe 1, D-91058 Erlangen, Germany, AND: Fraunhofer-Institute for Silicate Research ISC, Neunerplatz 2, D-97082 Würzburg, Germany, K.M.: Department of Chemistry and Pharmacy, Inorganic Chemistry, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), EgerlandstraÙe 1, D-91058 Erlangen, Germany, AND: Fraunhofer-Institute for Silicate Research ISC, Neunerplatz 2, D-97082 Würzburg, Germany, TSG: Department of

12:15 **Lunch break**

Resource Strategies for a Circular Transition : Sanjay Mathur

14:00 **The Resource Footprint of Tomorrow's PV Industry** **O.03.1**

Lukas Wagner 1, Robert Pietzcker 2, Lorenz Friedrich 3, Dmitry Bogachuk 3, Jan
Christoph Goldschmidt1

1 Philipps-University Marburg, 35032 Marburg, Germany, 2 Potsdam Institute for Climate
Impact Research, 14412 Potsdam, Germany, 3 Fraunhofer Institute for Solar Energy
Systems, 79110 Freiburg, Germany.

14:30 **Developing Non-Critical Circular Materials for the Green Energy Transition** **O.03.2**

Anke Weidenkaff 1,2, Andrea Gassmann 1, Emanuel Ionescu 1, Marc Widenmeyer 2,
Wenji Xie 2

1 Fraunhofer IWKS, Brentanostr. 2a, D-63755 Alzenau, Germany, 2 Technische
Universität Darmstadt, Institute for Materials Science, Alarich-Weiss-Straße 2, D-
64287 Darmstadt, Germany

14:45 **Designing Soft Electronics for a Circular economy** **O.03.3**

Matthew Wei Ming Tan, Hyunwoo Bark, Gurunathan Thangavel, Pooi See Lee
School of Materials Science and Engineering, Nanyang Technological University,
Singapore

15:00 **Digital information management in the actor chain of the circular economy in
the manufacturing chemical industry** **O.03.4**

Andrea Gassmann 1, Romy Auerbach 1, Tabea Hagedorn 2, Alice Lopes 2, Benedikt
Völker 3, Carsten Binnig 3, Liselotte Schebek 1,2

1 Fraunhofer IWKS, Brentanostr. 2a, D-63755 Alzenau, Germany, 2 Technische Universität Darmstadt, Chair of Material Flow Management and Resource Economy, Franziska-Braun-Straße 7, D-64287 Darmstadt, Germany, 3 Technische Universität Darmstadt, Data Management, Hochschulstr. 10, 64289 Darmstadt, Germany

15:15 **Coffee break**

Materials Synthesis, Processing and Recovery I : Emanuel Ionescu

16:00 **New opportunities for silicon-based polymer derived ceramics in beyond Li+ batteries** **O.04.1**
Gurpreet Singh

Kansas State University, Manhattan (Kansas), United States

16:30 **Phosphate recovery from wastewater streams using ZnO materials synthesized by atomic layer deposition** **O.04.2**

Marina Avena Maia, Ren© Hauser, Laura Torrente-Murciano
Catalysis and Process Integration Group. Department of Chemical Engineering and Biotechnology, University of Cambridge, CB3 0AS, United Kingdom, Delft IMP, Molengraaffsingel 8, 2629 JD, Delft, The Netherlands, Catalysis and Process Integration Group. Department of Chemical Engineering and Biotechnology, University of Cambridge, CB3 0AS, United Kingdom

16:45 **Carbonized Bone Waste for Photothermal Desalination** **O.04.3**

1,2MUHAMMAD SHAJIH ZAFAR, 1ATHANASSIA ATHANASSIOU, 1DESPINA FRAGOULI

1Smart Materials, Istituto Italiano di Tecnologia, via Morego 30, 16163 Genoa, Italy
2Dipartimento di Informatica, Bioingegneria, Robotica e Ingegneria dei Sistemi (DIBRIS), Università degli Studi di Genova, Via Opera Pia 13, 16145 Genoa, Italy

17:00 **Synthesis Of Silver And Rhamnolipid Coated M-POSS - Based Nanoparticles With Enhanced Antibacterial Properties** **O.04.4**

Melisa Kafali¹, Gülneş³⁵¹, Kibar*^{2,3,4}, O. Berk Usta^{3,4}, Batur Ercan*^{1,5,6}

1) Department of Metallurgical and Materials Engineering, Middle East Technical University, Ankara, Turkey 2) Department of Materials Engineering, Faculty of Engineering, Adana Alparslan Turkes Science and Technology University, 01250 Adana, Turkey 3) Center for Engineering in Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, MA, 02114, USA 4) Shriners Hospitals for Children, Boston, MA, 02114, US 5) Department of Biomedical Engineering, Middle East Technical University, Ankara, Turkey 6) BIOMATEN, METU Center of Excellence in Biomaterials and Tissue Engineering, Ankara, Turkey *Corresponding Author: Gunes Kibar (gkibar@atu.edu.tr), Batur Ercan (baercan@metu.edu.tr)

Postersession I : Andrea Gassmann

- | | | |
|-------|---|------------------|
| 17:30 | <p>Ultrasound Influence on the Physical-Chemical Processes in Solutions for Nanomaterials</p> <p>Irinela Chilibon</p> <p>National Institute of Research and Development for Optoelectronics, INOE 2000, Romania</p> | O.O-Pos.1 |
| 17:30 | <p>Evaluation of Chemical Recycling Pathways of Perovskite-type Oxygen Transport Membranes Used in Plasma-assisted CO₂-Conversion</p> <p>Aasir Rashid, Marc Widenmeyer, Sungho Baek, Guoxing Chen, Anke Weidenkaff</p> <p>Technical University of Darmstadt, Department of Materials and Geo Science, Research Division Materials & Resources, Darmstadt, Germany, Technical University of Darmstadt, Department of Materials and Geo Science, Research Division Materials & Resources, Darmstadt, Germany, Technical University of Darmstadt, Department of Materials and Geo Science, Research Division Materials & Resources, Darmstadt, Germany, Fraunhofer Research Institution for Material Recycling and Resource Strategies IWKS, Alzenau, Germany, Technical University of Darmstadt, Department of Materials and Geo Science, Research Division Materials & Resources, Darmstadt, Germany and Fraunhofer Research Institution for Material Recycling and Resource Strategies IWKS, Alzenau, Germany</p> | O.O-Pos.5 |
| 17:30 | <p>Fire resistant and thermal insulator materials obtained from wood sawdust waste</p> <p>L.C. Cotet, A. Mihis, C. Salagean, I. Szekely, K. Magyari, M. Muresan-Pop, I. Zgura, E. Matei, M. Baibarac, I. Anghel, L. Baia, M. Baia</p> <p>-Authors 1-5, 11, 12: "Babeş-Bolyai" University, Street Mihail Kogălniceanu, No. 1, RO-400084, Cluj-Napoca, Romania, -Authors 6-9: National Institute of Materials Physics, Bucharest-Magurele, 077125, Romania, -Author 10: Fire Officers Faculty, "Alexandru Ioan Cuza" Police Academy, Bucharest, 022451, Romania</p> | O.O-Pos.7 |
| 17:30 | <p>Solvent-free Mechanochemical Synthesis of CsMnBr₃</p> | O.O-Pos.4 |

Amanpreet Kalra¹, Songhak Yoon¹, Marc Widenmeyer², Arnulf Rosspeintner³, Benjamin Balke¹, Anke Weidenkaff^{1,2}

¹Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKS, Aschaffener Straße 121, 63457 Hanau, Germany, ²Technical University of Darmstadt, Alarich-Weiss-Straße 2, 64287 Darmstadt, Germany, ³University of Geneva, Quai Ernest Ansermet 30, CH-1211 Geneva 4, Switzerland

17:30 **Development of glycolysis process for chemical recycling of PET**

O.O-Pos.3

Dieu Minh Ngo, Wonseok Jo, Hyun Min Jung*

Department of Applied Chemistry, Kumoh National Institute of Technology, 61 Daehak-ro, Gumi, Republic of Korea Department of Energy Engineering Convergence, Kumoh National Institute of Technology, 61 Daehak-ro, Gumi, Republic of Korea

17:30 **Evaluation of the Thermomechanical Properties of Ce-coated YSZ with Core-Shell Structure**

O.O-Pos.6

Junseong Kim, Bong-Gu Kim, Janghyeok Pyeon, Tserendorj Khadaa, Hyeryang Choi, Donghyun Kim, Haeun Kim, Jung-Hun Son, Byung-il Yang, SeungCheol Yang

Department of Materials Convergence and System Engineering, Changwon, Gyeongnam 641-773, Republic of Korea

17:30 **Bio-Degradable Face Mask infused with Antibacterial Medicinal Plant Extract derived Nanoparticles**

O.O-Pos.2

K Govardhan* & J Priyanka

K Govardhan*, Department of Micro and NanoElectronics, School of Electronics Engineering, Vellore Institute of Technology, Vellore, Tamil Nadu, India J Priyanka, Department of Physics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, Tamil Nadu, India

17:30 **Recycling for all-solid-state lithium batteries with halide-based-solid electrolyte Li₃InCl₆**

O.O-Pos.8

Martine Jacob, Kerstin Wissel, Oliver Clemens

Universität Stuttgart, Institut für Materialwissenschaft, Abteilung Chemische Materialsynthese, Stuttgart, Germany

TUESDAY, 20 SEPTEMBER 2022

Materials Synthesis, Processing and Recovery II : Anke Weidenkaff

9:00 **Topological catalysis**

O.O5.1

Guowei Li, Yu Kang, Qun Yang, Uttam Gupta, Gudrun Auffermann, Yan Sun, Claudia Felser

Max Planck Institute Chemical Physics of Solids, Dresden, Germany

9:30 **Thermoelectric properties of iron intercalated TiS₂** **0.05.2**

Jinxue Ding a, Wenjie Xie a, Anke Weidenkaff a,b

a) Materials and Resources, Department of Materials and Earth Sciences, Technical University of Darmstadt, 64287 Darmstadt, Germany, b) Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKS, 63755 Alzenau, Germany

Pechini-like Chemical Recycling Process Development for Oxygen Transport Membrane Material (La_{0.9}Ca_{0.1})₂Ni_{0.75}Cu_{0.25}O₄±#948, and its

9:45 **Environmental Evaluation with Life Cycle Assessment** **0.05.3**

Melanie Johanning, Marc Widenmeyer, Giamper Escobar Cano, Vanessa Zeller, Guoxing Chen, Armin Feldhoff, Anke Weidenkaff

Technical University of Darmstadt, Department of Materials and Geo Science, Research Division Materials & Resources, Darmstadt, Germany, Technical University of Darmstadt, Department of Materials and Geo Science, Research Division Materials & Resources, Darmstadt, Germany, Leibniz University Hannover, Institute of Physical Chemistry and Electrochemistry, Hannover, Germany, Technical University of Darmstadt, Research Division of Material Flow Management and Resource Economy, Darmstadt, Germany, Fraunhofer Research Institution for Material Recycling and Resource Strategies IWKS, Alzenau, Germany, Leibniz University Hannover, Institute of Physical Chemistry and Electrochemistry, Hannover, Germany, Technical University of Darmstadt, Department of Materials and Geo Science, Research Division Materials & Resources, Darmstadt, Germany and Fraunhofer Research Institution for Material Recycling and Resource Strategies IWKS

10:00 **Ionovoltaic electricity generation over graphene-nanoplatelet: protein-nanofibril hybrid materials** **0.05.4**

Lei Wang, Niclas Solin

Division of Electronic and Photonic Materials, Biomolecular and Organic Electronics, Department of Physics, Chemistry, and Biology, Linköping University, Linköping, 581 83, Sweden

10:15 **Synergistic effects of Eu and Nb dual substitution on improving the thermoelectric performance of the natural perovskite CaTiO₃** **0.05.5**

Xingxing Xiao 1, Wenjie Xie 1, Marc Widenmeyer 1, Maximilian Mellin 2, Aamir Iqbal Waidha 3, Oliver Clemens 3, Anke Weidenkaff 1,4

1 Materials and Resources, Department of Materials and Earth Sciences, Technical University of Darmstadt, 64287 Darmstadt, Germany, 2 Surface Science, Department of Materials and Earth Sciences, Technical University of Darmstadt, 64287 Darmstadt, Germany, 3 Materials Synthesis Group, Institute of Material Science, University of Stuttgart, 70569 Stuttgart, Germany, 4 Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKS, 63755 Alzenau, Germany

10:30 **Coffee break**

Sustainability of Battery Systems : Claudia Felser

11:00 **Suppling The European Battery Market With Raw Materials - Lithium Mining in Europe** **O.06.1**

Fabian Jeschull 1, Laura Herrmann 1,2, Elif Kaymakci 2, Thomas K  lbel 2

1 Karlsruhe Institute of Technology, Institute for Applied Materials – Energy Storage Systems (IAM-ESS), Eggenstein-Leopoldshafen, Germany 2 EnBW Energie Baden-W  rttemberg

11:30 **Characterization of wastewater from lithium battery recycling and evaluation of lithium recovery processes** **O.06.2**

Ronja Wagner-Wenz, J  rg Zimmermann, Benjamin Balke, Emanuel Ionescu, Liselotte Schebek und Anke Weidenkaff

Fraunhofer-Einrichtung f  r Wertstoffkreisl  ufe und Ressourcenstrategie IWKS Brentanostra  e 2a | 63755 Alzenau | Germany

11:45 **Lithium recycling from LFP using a novel high-efficient mechanochemical approach** **O.06.3**

David Gei  , Oleksandr Dolotko, Michael Knapp, Helmut Ehrenberg

Karlsruher Institut f  r Technologie (KIT), Institute for Applied Materials - Energy Storage Systems (IAM-ESS), D-76344 Eggenstein-Leopoldshafen, Germany

12:00 **Recycling of all-solid-state Li-ion batteries: a case study of LTO/LLZTO/NMC system** **O.06.4**

Aamir Iqbal Waidha a, Amila Salihovic b, Wolfgang Ensinger a, Oliver Clemens b

a Institute of Materials Science, Technical University of Darmstadt, 64283, Darmstadt, Germany, b Institute of materials science, University of Stuttgart, 70569, Stuttgart, Germany

12:15 **Development of sustainable recycling strategies for thiophosphate-based all-solid-state Li-ion batteries** **O.06.5**

Kerstin Wissel 1,2, Wolfgang Ensinger 1, Oliver Clemens 2

1 Technische Universität Darmstadt, Institut für Materialwissenschaft, Fachgebiet Materialanalytik, Darmstadt, Germany, 2 Universität Stuttgart, Institut für Materialwissenschaft, Abteilung Chemische Materialsynthese, Stuttgart, Germany

12:30 **Symposium wrap-up & GSA award announcement: Andrea Gassmann**

13:00 **Lunch break**



LIGHTCAP



ISTITUTO ITALIANO
DI TECNOLOGIA



Dipartimento
di Scienze Chimiche
e Farmaceutiche



Symposium P

Sessions: Room 327 | Main Building

Materials for a sustainable transition:

Breakthrough zero-emissions energy storage and conversion technologies for carbon-neutrality

Symposium Organizers: **Albert TARANCON** Catalonia Institute for Energy Research – IREC Spain

Ilka KRIEGEL Functional Nanosystems Italian Institute of Technology Italy

Simone MELONI University of Ferrara Italy

Víctor A. DE LA PENA O'SHEA IMDEA Energy Spain

Symposium P Program

MONDAY, 19 SEPTEMBER 2022

9:00 **OPENING AND WELCOME**

Electrochemical Energy Storage : Ilka Kriegel

9:15 **Sustainable Batteries and Electrocatalysis for Clean Energy Technologies** **P.Mo1.1**

Magda Titirici, Heather Au, Maria Crespo, Hui Luo, Angus Pedersen,

Imperial College London

9:45 **Controlling charge carrier ions in electrochemical energy storage devices** **P.Mo1.2**

Minghao Yu, Xinliang Feng

Faculty of Chemistry and Food Chemistry & Center for Advancing Electronics
Dresden (cfaed), Technische Universität Dresden, 01062 Dresden, Germany

10:00 **2D transition metal dichalcogenide-conductive polymer hydrogels for flexible energy storage devices** **P.Mo1.3**

Matteo Crisci¹, Sara Domenici¹⁻², Jonas Pflug¹, Felix Boll¹, Teresa Gatti¹

¹Center for Materials Research, Justus Liebig University, Heinrich-Buff-Ring
17, 35392 Giessen, Germany ² Department of Chemical Sciences, University
of Padova, via Marzolo 1, 35131 Padova, Italy

10:15 **NOVEL SOLID POLYMER ELECTROLYTES FOR SOLID-STATE BATTERIES** **P.Mo1.4**

BENOÎT NOTREDAME*, Jean-François GOHY

UCLouvain & #8211; IMCN - BSMA 1, Place Louis Pasteur, 1348 Louvain-la-
Neuve

10:30 **COFFEE BREAK**

11:00 **Monolithic metal-organic frameworks** **P.Mo2.1**

David Fairen-Jimenez

The Adsorption & Advanced Materials Laboratory (A2ML), Department of
Chemical Engineering & Biotechnology, University of Cambridge, Cambridge,
UK. df334@cam.ac.uk

Mechanical and Thermal Energy : Magda Titirici

11:30 **Effect of flexibility on the water intrusion/extrusion pressure of ZIF-8_Cm for energy conversion applications** **P.Mo2.2**

Eder Amayuelas^{1*}, Josh David Littlefair², Luis Bartolom  ^{  1}, Sandeep Kumar Sharma^{3,4}, Jaideep Mor³, Pranav Utpalla³, Pawe  ^{#322}, Zajdel⁶, Yaroslav Grosu^{1,7}

1 Centre for Cooperative Research on Alternative Energies (CIC energiGUNE), Basque Research and Technology Alliance (BRTA), Alava Technology Park, Albert Einstein 48, 01510 Vitoria-Gasteiz, Spain. 2 Dipartimento di Scienze Chimiche, Farmaceutiche e Agrarie (DOCPAS), Universit   degli Studi di Ferrara (Unife), Via Luigi Borsari 46, I-44121, Ferrara, Italy. 3 Radiochemistry Division, Bhabha Atomic Research Centre Mumbai, India 400 085 4 Homi Bhabha National Institute, Anushaktinagar, Mumbai 400 094 6 Institute of Physics, University of Silesia, 75 Pulku Piechoty 1, 41-500, Chorzow, Poland. 7 Institute of Chemistry, University of Silesia, Szkolna 9, 40-006 Katowice, Poland.

11:45 **Design principles for Li-ion based thermal energy harvesters using TREC** **P.Mo2.3**

Louis L. De Taeye, Liese B. Hubrechtsen, Philippe M. Vereecken

Imec - Kapeldreef 75, Leuven, 3001, Belgium, KU-Leuven Centre for Membrane Separations, Adsorption, Catalysis, and Spectroscopy for Sustainable Solutions - Celestijnenlaan 200F - box 2454, Leuven, 3001, Belgium

12:00 **Effect of alcohol-water mixture on intrusion-extrusion process in nanoporous materials** **P.Mo2.4**

Andrea Le Donne, Alexander Lowe, Miroslaw Chorazewski, Yaroslav Grosu, Simone Meloni

Dipartimento di Scienze Chimiche, Farmaceutiche e Agrarie (DOPAS), Universit   degli Studi di Ferrara (Unife), Ferrara, Italy, Institute of Chemistry, University of Silesia, Szkolna 9, 40-006 Katowice, Poland, Institute of Chemistry, University of Silesia, Szkolna 9, 40-006 Katowice, Poland, Centre for Cooperative Research on Alternative Energies (CIC energiGUNE), Basque Research and Technology Alliance (BRTA), Alava Technology Park, Albert Einstein 48, 01510 Vitoria-Gasteiz, Spain, Dipartimento di Scienze Chimiche, Farmaceutiche e Agrarie (DOPAS), Universit   degli Studi di Ferrara (Unife), Ferrara, Italy

12:30 **LUNCH BREAK**

Solar Energy Conversion (I) : Teresa Gatti

14:00	Nanoelectrochemical methods for Solar Energy Esther Alarcon-Llado AMOLF	P.Mo3.1
14:30	Crystal Structure and Exciton Behavior of EosinY and Methylene Blue Organic Dye Pair Exhibiting Photo-Induced Charge Separation Junya Kimura ¹ , Erika Saito ^{dL'} , Midori Suzuki ^{dL'} , Tsukasa Yoshida ^{dL'} 1 ^{dL'} Yamagata university	P.Mo3.2
14:45	High Voc Cs₂AgBiBr₆ carbon-based perovskite solar cells via green processing of carbon electrodes from waste tire sources Fabian Schmitz, ^{1,2} Nicol� Lago, ³ Lucia Fagiolari, ⁴ Julian Burkhart, ¹ Andrea Cester, ³ Andrea Polo, ³ Mirko Prato, ⁵ Gaudenzio Meneghesso, ^{3,6} Silvia Gross, ^{6,7} Federico Bella, ⁴ Francesco Lamberti, ^{6,7} Teresa Gatti ^{1,2} 1 Institute of Physical Chemistry, Justus Liebig University, Heinrich-Buff-Ring 17, 35392 Giessen, Germany 2 Center for Materials Research, Justus Liebig University, Heinrich-Buff-Ring 17, 35392 Giessen, Germany 3 Department of Information Engineering, University of Padova, Via Gradenigo 6/B, 35131 Padova, Italy 4 Department of Applied Science and Technology, Politecnico di Torino, C.so Duca degli Abruzzi 24, 10129 Torino, Italy 5 Materials Characterization Facility, Istituto Italiano di Tecnologia, Via Morego 30, 16163, Genova, Italy 6 Center ��� Giorgio Levi Cases��� for Energy Economics and Technology, Via Marzolo 9, 35131, Padova, Italy 7 Department of Chemical Sciences, University of Padova, Via Marzolo 1, 35131 Padova, Italy	P.Mo3.3
15:15	The effect of operating environments on surface composition evolution of perovskite-type mixed conducting electrodes Zijie Sha, Zonghao Shen, Eleonora Cal��, John A. Kilner, and Stephen J. Skinner Department of Materials, Exhibition Road, Imperial College London, London, SW7 2AZ, UK.	P.Mo3.5
15:30	COFFEE BREAK	
Solid Oxide Cells : Alarcon-Llado Esther		
16:00	Novel deposition strategies to obtain thin films with improved functional properties for Solid Oxide Fuel and Electrolysis Cell	P.Mo4.1

M. Burriel* (a), Alexander Stangl (a), Adeel Riaz (a,b), R. Rodriguez-Lamas (a), C. Pirovano (c), L. Rapenne (a), E. Sarigiannidou (a), D. Pla (a), O. Chaix-Pluchery (a), Michel Mermoux (b), R.-N. Vannier (c), and C. Jimenez (a)

(a) Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, F-38000 Grenoble, France (b) Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, LEPMI, 38000 Grenoble, France (c) Univ. Lille, CNRS, Centrale Lille, ENSCL, Univ. Artois, UMR 8181 - UCCS - Unité de Catalyse et Chimie du Solide, F-59000 Lille, France

16:30 **All-ceramic functional layers based on nanostructured LSCrMn-SDC heterointerfaces for electrode application in solid oxide cells** **P.Mo4.2**

Juan de Dios Sirvent(a), Albert Carmona(a), Laetitia Rapenne(b), Francesco Chiabrera(a), Alex Morata(a), Mălina Burriel(b), Federico Baiutti(a,c), Albert Tarancón(a,d).

(a) Department of Advanced Materials for Energy, Catalonia Institute for Energy Research (IREC), Jardins de les Dones de Negre 1, Sant Adrià del Besòs, Barcelona 08930, Spain (b) Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, 38000 Grenoble, France (c) Department of Materials Chemistry, National Institute of Chemistry, Hajdrihova 19, Ljubljana SI-1000, Slovenia (d) ICREA, Passeig Lluís Companys 23, 08010 Barcelona, Spain

16:45 **Electron beam evaporation technique for the preparation of thin film interlayers for solid oxide fuel cells** **P.Mo4.3**

Brigita Abakevičienė, Fariza Kalyk, Tomas Tamulevičius, Sigita Tamulevičiūtė

Kaunas University of Technology, K. Donelaičio st. 73, LT-44249 Kaunas, Lithuania

17:00 **Cobalt-free (La_{1-x}Sr_x)(Fe_{1-y}Ni_y)O_{3-δ} as Cathode for Solid Oxide Fuel Cells: Structural Investigation under Reducing Conditions** **P.Mo4.4**

Hyunjung Lim 1,2, Gwangsik Mun 1, Songhak Yoon 1, Marc Widenmeyer 2, Benjamin Balke 1, Anke Weidenkaff 1,2

1 Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKS, Aschaffener Straße 121, 63457 Hanau, Germany 2 Technical University of Darmstadt, Alarich-Weiss-Straße 2, 64287 Darmstadt, Germany

17:15 **A cobaltite-based thin film nanocomposite functional layer with enhanced electrochemical stability for solid oxide cells** **P.Mo4.5**

Fjorelo Buzi (1), Kosova Kreka (1), JosĂ© Santiso (2), Monica Burriel (3), Lucile Bernadet (1), Federico Baiutti (1), Albert TarancĂn (1,4)

(1) Catalonia Institute for Energy Research (IREC), Jardins de Les Dones de Negre 1, 08930 Sant AdriĂ Besos, Barcelona, Spain, (2) Catalonia Institute for Nanoscience and Nanotechnology (ICN2), Campus de la Universitat AutĂnoma de Barcelona, Edifici ICN2, Av. de Serragalliners, s/n, 08193 Bellaterra, Barcelona, (3) Laboratories of Materials and Physical Engineering (LMGP) UMR 5628 CNRS, Grenoble INP Minattec 3, Parvis Louis NĂel CS 50257 38016 GRENOBLE Cedex 1 France, (4) ICREA, Passeig LluĂs Companys 23, Barcelona 08010, Spain

TUESDAY, 20 SEPTEMBER 2022

Electrocatalysis : Simone Meloni

9:00 **Space-charge-mediated phenomena at oxide interfaces for catalysis in electrochemical water splitting** **P.Tu1.1**

Moritz Weber, Lisa Heymann, Anton Kaus, Marcus Wohlgemuth, Christoph BĂumer, Felix Gunkel

Peter GrĂnberg Institute, Forschungszentrum JĂlich, Germany, MESA+ Institute, University of Twente, The Netherlands

9:30 **Immobilization of Redox Active Centres in Porous Polymers for Energy Storage Applications** **P.Tu1.2**

Hakan Bildirir, Diego A. Alvan, Nagaraj Patil, Rebecca Grieco, VĂctor A. de la PeĂa OĂ'Shea, Marta Liras, Rebeca Marcilla

Hakan Bildirir 1,2, Diego A. Alvan 1, Nagaraj Patil 1, Rebecca Grieco 1, VĂctor A. de la PeĂa OĂ'Shea 2, Marta Liras 2, Rebeca Marcilla 1 1 Electrochemical processes Unit, IMDEA Energy, Mostoles/Spain 2 Photoactivated Processes Unit, IMDEA Energy, Mostoles/Spain

9:45 **Nanoscale model tailoring of novel ceria-based catalyst: effect of doping by transition metals** **P.Tu1.3**

Lesia Piliai a, Mykhailo Vorokhta a, TomĂŠ SkĂla a,b, Peter Matvija a, Ivan Khalakhan, a Yuliia Kosto a, Iva MatolĂnovĂ a

a) Department of Surface and Plasma Science, Charles University, Prague, Czech Republic, b) Elettra-Sincrotrone Trieste S.C.p.A., Basovizza (Trieste), Italy

10:00 **An investigation of the robust catalytic system for chemical fixation of CO₂ into cyclic carbonates** **P.Tu1.4**

Rajendra B. Mujmule, Hern Kim

Department of Energy Science and Technology / Environmental Waste Recycle Institute, Myongji University, Republic of Korea

10:15 **Separating the effects of band bending and covalency in hybrid perovskite oxide electrocatalyst bilayers for water electrolysis** **P.Tu1.5**

Lisa Heymann, Moritz L. Weber, Marcus Wohlgemuth, Marcel Risch, Regina Dittmann, Christoph Baeumer, Felix Gunkel

Lisa Heymann: Peter Gr  nberg Institut 7, Forschungszentrum J  lich GmbH, J  lich, Germany and JARA-FIT, RWTH Aachen University, Aachen, Germany, Moritz L. Weber: Peter Gr  nberg Institut 7, Forschungszentrum J  lich GmbH, J  lich, Germany and JARA-FIT, RWTH Aachen University, Aachen, Germany, Marcus Wohlgemuth: Peter Gr  nberg Institut 7, Forschungszentrum J  lich GmbH, J  lich, Germany and JARA-FIT, RWTH Aachen University, Aachen, Germany, Marcel Risch: Nachwuchsgruppe Gestaltung des Sauerstoffentwicklungsmechanismus, Helmholtz-Zentrum Berlin f  r Materialien und Energie GmbH, Berlin, Germany, Regina Dittmann: Peter Gr  nberg Institut 7, Forschungszentrum J  lich GmbH, J  lich, Germany and JARA-FIT, RWTH Aachen University, Aachen, Germany, Christoph Baeumer: (a) Peter Gr  nberg Institut 7, Forschungszentrum J  lich GmbH, J  lich, Germany and JARA-FIT, RWTH Aachen University, Aachen, Germany and (b) MESA+ Institute for Nanotechnology, Faculty of Science and Technology, University of Twente, Enschede, Netherlands, Felix Gunkel: Peter Gr  nberg Institut 7, Forschungszentrum J  lich GmbH, J  lich, Germany and JARA-FIT, RWTH Aachen University, Aachen, Germany

10:30 **COFFEE BREAK**

Mechanical and Thermal Energy (II) : Felix Gunkel

11:00 **Nanoporous Zeolitic Frameworks for Mechanical Energy Absorption** **P.Tu2.1**

Jin-Chong Tan (1), Yueting Sun (1,2), Sven M.J. Rogge (3), Clive R. Siviour (4), Veronique Van Speybroeck (3)

(1) Multifunctional Materials & Composites (MMC) Laboratory, Department of Engineering Science, University of Oxford, Parks Road, Oxford OX1 3PJ, United Kingdom. (2) School of Engineering, University of Birmingham, Edgbaston, Birmingham, United Kingdom. (3) Center for Molecular Modeling (CMM), Ghent University, Zwijnaarde, Belgium. (4) Department of Engineering Science, University of Oxford, Parks Road, Oxford OX1 3PJ, United Kingdom.

11:30 **System level supercooling measurement of a eutectic phase change material for cold thermal energy storage application** **P.Tu2.2**

Rahul Kumar Singh, Antoni Gil Pujol, Purvi Jain, Alessandro Romagnoli

Rahul Kumar Singh , Antoni Gil Pujol , Purvi Jain - Surbana Jurong â€œ Nanyang Technological University Corporate Lab, 61 Nanyang Drive, 637355, Singapore Alessandro Romagnoli - School of Mechanical and Aerospace Engineering, Nanyang Technological University, 50 Nanyang Avenue, 639798, Singapore

11:45 **On the Exceptional Negative Compressibility of Zeolitic Imidazolate Frameworks (ZIFs) and Potential Applications** **P.Tu2.3**

Josh D. Littlefair*, Marco Tortoraâ€ , Paweł, Zajdelâ€ , Alexander R. LoweÂ§, Mirosław Chorążewski Â§, Juscelino B. Leão**, Grethe V. Jensen**, Markus Bleuel**, Alberto Giacomelloâ€ , Carlo M. Casciolaâ€ , Simone Meloni*, Yaroslav Grosuâ€ â€

*Università di Ferrara, Italy â€ Sapienza Università di Roma, Italy
â€ University of Silesia in Chorzów, Poland Â§University of Silesia in Katowice, Poland **NIST Center for Neutron Research, United States
â€ â€ CIC energiGUNE, Spain

12:00 **Using Scanning Transitiometry to Investigate the Thermal and Mechanical Changes of Simple and Complex Systems for Energy Storage** **P.Tu2.4**

Alexander R Lowe, Mirosław Chorazewski
Institute of Chemistry, University of Silesia in Katowice, 40-006 Katowice, Poland

12:15 **Thermomechanical and structural properties of {Cu₂(tebpz) MOF + water} molecular spring in a wide temperature range** **P.Tu2.5**

Sebastiano Merchiori, Mirosław Chorążczycha, Paweł Zajdel, Alexander Lowe, Simone Meloni, Yaroslav Grosu

Department of Chemical, Pharmaceutical and Agricultural Sciences, University of Ferrara, Via Luigi Borsari 46, 44121, Ferrara, Italy, Institute of Chemistry, University of Silesia, Szkolna 9, 40-006 Katowice, Poland, Institute of Physics, University of Silesia, 75 Pulku Piechoty 1, 41-500, Chorzów, Poland, Institute of Chemistry, University of Silesia, Szkolna 9, 40-006 Katowice, Poland, Department of Chemical, Pharmaceutical and Agricultural Sciences, University of Ferrara, Via Luigi Borsari 46, 44121, Ferrara, Italy, CIC EnergiGUNE, Basque Research and Technology Alliance (BRTA), Alava Technology Park, Albert Einstein 48, 01510 Vitoria-Gasteiz, Spain

12:30 **LUNCH BREAK**

Solar Energy Storage (I) : Víctor Antonio de la Peña

14:00 **PHOTO-RECHARGEABLE REDOX FLOW BATTERIES** **P.Tu3.1**

Dábor Ruiz-Martínez, Rebeca Marcilla

Electrochemical Processes Unit, IMDEA Energy, Avenida Ramón de la Sagra 3, 28935 Móstoles, Madrid, Spain

14:30 **Zero-Dimensional Nanocrystals and Two-Dimensional Materials for Solar Energy Applications** **P.Tu3.3**

Nastaran Kazemi Tofighi, 1 Aswin Asaithambi, 1 Ivet Maqueira Albo, 1.2, Nicola Curreli, 1 Andrea Camellini, 1. Ilka Krieger, 1

1. Functional Nanosystems, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genoa, Italy, 2. Physics Department, University of Genoa, Via Dodecaneso 33, 16146 Genoa, Italy

14:45 **COMPARISON OF OPTICAL RESPONSE OF PHOTODOPING TO THE ELECTROCHEMICAL SIGNATURES- A SPECTROELECTROCHEMISTRY APPROACH** **P.Tu3.4**

Anjana Panangattil Muraleedharan, Michele Ghini, Luca Rebecchi, Andrea Rubino, Andrea Camellini, Ilka Krieger

Functional Nanosystems, Istituto Italiano di Tecnologia, Genova, Italy

15:00 **Laser-Reduced BiVO₄ for Enhanced Photoelectrochemical Water Splitting** **P.Tu3.5**

Mariam Barawi,¹ Miguel Gomez-Mendoza,¹ Freddy E. Oropeza,¹ Giulio Gorni,² Ignacio J Villar-Garcia,³ Sixto Gimenez,⁴ Victor A. de la Peña O'Shea¹ and Miguel García-Tecedor*¹

1. Photoactivated Processes Unit, IMDEA Energy, Avda. Ramón de la Sagra, 3, Móstoles, 28935, Spain. 2. CLAS Beamline, ALBA Synchrotron, Carrer de la Llum 2-26, Cerdanyola del Valles, 08290, Spain. 3. NAPP Endstation, CIRCE Beamline, ALBA Synchrotron, Carrer de la Llum 2-26, Cerdanyola del Valles, 08290, Spain. 4. Institute of Advanced Materials (INAM), Universitat Jaume I, Avda. Vicente Sos Baynat, s/n, Castellón, 12006, Spain.

15:15 **COFFEE BREAK**

Advanced Characterization (I) : Liese Hubrechtsen

16:00 **Operando Cells for Soft X-ray Spectroscopy of Energy Materials** **P.Tu4.1**

Santosh Kumar,⁽¹⁾ James Counter,⁽¹⁾ Paul B. Webb,⁽²⁾ Stephen Francis,⁽²⁾ Federico Grillo,⁽²⁾ Pilar Ferrer,⁽¹⁾ David C. Grinter,⁽¹⁾ Anna B. Kroner,⁽¹⁾ Georg Held,⁽¹⁾

(1) Diamond Light Source, Harwell Science and Innovation Campus, Didcot, Oxfordshire, OX11 0DE, UK, (2) School of Chemistry, University of St Andrews, North Haugh, St Andrews KY16 9ST, UK,

16:30 **Understanding electrochemical PdH_x and PdD_x formation in nanoparticles for designing a cold fusion measurement setup** **P.Tu4.2**

Lilian Moumaneix, Akseli Rautakorpi, Tanja Kallio
Department of Chemistry and Materials Science, Aalto University, 00076 Aalto, Finland

16:45 **Development of a micro-spectroelectrochemical setup for the in-situ study of light-driven chemical reactions** **P.Tu4.3**

Ivet Maqueira Albo, Nastaran Kazemi Tofighi, Andrea Camellini, Aswin Asaithambi, and Ilka Krieger
Functional Nanosystems, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy

17:00 **High-throughput methodologies for the study of cathodes in solid oxide cells: the La_{0.8}Sr_{0.2}CoxMnyFe_{1-x-y}O₃ perovskite family** **P.Tu4.4**

Juan de Dios Sirvent(a), Giulio Cordaro(b), Dominique Thiaudière(c), Marc Năşăez(a), Alex Morata(a), Guilhem Dezanneau(b), Federico Baiutti(a,d), Albert Tarancăn(a,e)

(a) Department of Advanced Materials for Energy, Catalonia Institute for Energy Research (IREC), Jardins de les Dones de Negre 1, Sant Adrià del Besà, Barcelona 08930, Spain (b) Université Paris-Saclay, CentraleSupélec, CNRS, Lab. SPMS, 91190 Gif-sur-Yvette, France (c) Synchrotron Soleil, 91192 Gif-sur-Yvette, France (d) Department of Materials Chemistry, National Institute of Chemistry, Hajdrihova 19, Ljubljana SI-1000, Slovenia (e) ICREA, Passeig Luàs Companys 23, 08010 Barcelona, Spain

WEDNESDAY, 21 SEPTMEBER 2022

Solar Energy Conversion (II) : Albert Tarancăn

14:00 **Nanostructuring Conjugated Porous Polymer for solar energy conversion in photoelectrochemical cells** **P.We3.1**

Mariam Barawi*1, Elena Alfonso1, Carmen G. Lăpez-Calixto1, Alberto Garcăa1, Alba Garcăa1, Ignacio J. Villar-Garcăa2, Marta Liras1, Victor A. de la Peăa OăShea 1

1- Photoactivated Proceses Unit IMDEA Energy Institute, Av. Ramăn de la Sagra 3, 28935 Măstoles, Madrid, Spain 2- CIRCE Beamline. ALBA Synchrotron, Barcelona, Spain.

14:30 **Influence of glass transition temperature of polymer support layer on graphene transfer onto perovskite thin films.** **P.We3.2**

Liudmila Starodubtceva (a,b), Piotr J. Cegielski (a), Sebastian Lukas (b), Martin Otto (a), Shayan Parhizkar (a), Max C. Lemme (a,b). a) AMO GmbH, Advanced Microelectronic Center Aachen, Otto-Blumenthal-Str. 25, 52074 Aachen, Germany b) Chair of Electronic Devices, RWTH Aachen University, Otto-Blumenthal-Str. 2, 52074 Aachen, Germany

This work has received funding from the German Ministry of Education and Research (BMBF) under grant agreement 16ES1121 (ForMikro-NobleNEMS) and from the European Union's Horizon 2020 research and innovation programme under grant agreements 951774 (FOXES), 881603 (Graphene Flagship Core 3), 825272 (ULISSES), 952792 (2D-EPL) as well as from German Research Foundation (DFG) project LE 2440/12-1 (Hyper-Lase).

14:45 **Transparent Conductive Metal Oxides as materials for solar energy applications** **P.We3.3**

Luca Rebecchi, Andrea Rubino, Nicol  Petrini, Ilka Kriegel
 Functional Nanosystems, Istituto Italiano di Tecnologia, via Morego 30, 16163
 Genova, Italy - Dipartimento di Chimica e Chimica Industriale,
 Universit  degli Studi di Genova, Via Dodecaneso 31, 16146 Genova, Italy,
 Functional Nanosystems, Istituto Italiano di Tecnologia, via Morego 30, 16163
 Genova, Italy, Functional Nanosystems, Istituto Italiano di Tecnologia, via
 Morego 30, 16163, Genova, Italy - Dipartimento di Fisica, Universit  degli
 Studi di Genova, Via Dodecaneso 33, 16146, Genova, Italy, Functional
 Nanosystems, Istituto Italiano di Tecnologia, via Morego 30, 16163, Genova,
 Italy,

15:00 **Electrodeposition of CuSCN/TCNIH, MV hybrid thin films for charge transfer organic solar cells** **P.We3.4**

Mao Goto, Hiroto Yamagachi, Erika Saito, Yuki Tsuda, Kyota Uda, Tensho Nakamura, Atsuhiko Ueno, Tsukasa Yoshida

Yamagata university

15:15 **Photo-induced multiple-charge processes in inorganic and organic nano-systems for solar energy storage and conversion** **P.We3.5**

Andrea Rubino, Andrea Camellini, Michele Ghini, Luca Rebecchi, Ilka Kriegel

Functional Nanosystems, Istituto Italiano di Tecnologia (IIT), Via Morego 30, 16163 Genova, Italy, Dipartimento di Chimica e Chimica Industriale, Universit  degli Studi di Genova, Via Dodecaneso 31, 16146 Genova, Italy

15:30 **COFFEE BREAK**

Advanced Characterization (II) : M nica Burriel

16:00 **Development of a method for thermogalvanic characterization of Li-ion electrodes: a case study in thin-film anatase TiO₂** **P.We4.1**

Liese B. Hubrechtsen, Philippe M. Vereecken

Imec - Kapeldreef 75, Leuven, 3001, Belgium KU Leuven Centre for Membrane Separations, Adsorption, Catalysis, and Spectroscopy for Sustainable Solutions - Celestijnenlaan 200F, box 2454, Leuven, 3001, Belgium

16:30 **Direct Measurements of Hydrogen Exchange and Diffusion Kinetics at High Temperatures in Proton-Conducting Solid Oxide Materials** **P.We4.2**

Mudasir A Yatoo and Stephen J Skinner

Department of Materials, Faculty of Engineering, Imperial College London Royal School of Mines, SW7 2BP, London

16:45 **In-situ study of highly active Ru/CeO₂ catalyst for propane oxidation** **P.We4.3**

Mykhailo Vorokhta¹, Oleksii Bezkrovnyi², Thu Ngan Dinhov¹, Lesia Piliai¹, Iva Matolinova¹

1. Department of Surface and Plasma Science, Faculty of Mathematics and Physics, Charles University, V Holešovičkách 2, 180 00, Prague 8, Czech Republic, 2. W. Trzebiatowski Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Wrocław, Poland,

17:00 **Deposition and operando electrochemical characterization of thin films for all-solid state batteries** **P.We4.4**

A.Morata, J.C. Gonzalez-Rosillo, V. Siller, F.Chiabrera, M. Nuñez, RM. Stchakovsky, A. Tarancón,

(a) Department of Advanced Materials for Energy Applications, Catalonia Institute for Energy Research (IREC), Jardins de les Dones de Negre 1, 08930 Sant Adrià del Besòs, Barcelona, Spain (b) HORIBA Scientific, Avenue de la Vauve, Passage Jobin Yvon, 91120 Palaiseau, France (c) ICREA, Passeig Lluís Companys 23, 08010, Barcelona, Spain

17:15 **CLOSING AND AWARDS**



Symposium Q

Sessions: Room 309 | Main Building

Poster Session: Small Hall | Main Building

Materials for a sustainable transition:

Advanced catalytic materials for (photo)electrochem. energy conversion III

Symposium Organizers: **Byungha SHIN** Korea Advanced Institute of Science and Technology South Korea

Joachim JOHN Interuniversity MicroElectronic Centre (IMEC) Belgium

Lifeng LIU International Iberian Nanotechnology Laboratory (INL) Portugal

Vladimir SMIRNOV Forschungszentrum Jülich GmbH Germany

Symposium Q Program

MONDAY, 19 SEPTEMBER 2022

8:45 **Opening remark**

Electrocatalysis I : Vladimir Smirnov

9:00 **Electrochemical ammonia production** **Q.01.01**

Ib Chorkendorff

Department of Physics Technical University of Denmark

9:30 **Highly defective MoS₂ ultrathin nanoparticles for electrolytic hydrogen evolution** **Q.01.02**

Nuria Jiménez-Arvalo¹, Jinan Hussein Awadh Al Shuhaib¹,
Rodrigo Bautista Pacheco¹, Antonella Cutrupi², Mahmoud M Saad
Abdelnabi², Riccardo Frisenda², Maria Grazia Betti², Carlo
Mariani², Yolanda Manzanares³, Cristina Gómez Navarro^{3,4},
Antonio Martínez Galera^{1,4}, Jose Ramón Ares¹, Isabel
Jiménez Ferrer^{1,4}, Fabrice Leardini^{1,4}

¹ Departamento de Física de Materiales, Universidad Autónoma de Madrid, Campus de Cantoblanco, E-28049, Madrid, Spain. ² Dipartimento di Fisica, Sapienza Università di Roma, I-00185, Italy. ³ Departamento de Física de la Materia Condensada, Universidad Autónoma de Madrid, Campus de Cantoblanco, E-28049, Madrid, Spain. ⁴ Instituto Nicolas Cabrera, Universidad Autónoma de Madrid, Campus de Cantoblanco, E-28049, Madrid, Spain.

9:45 **Electrocatalytic HER Active RuS₂ Thin Films from a New CVD Process** **Q.01.03**

Jorit Obenlängeschloß, David Zanders, Jan-Lucas Wree, Anjana Devi

Ruhr University Bochum

10:00 **Metal-Organic Frameworks / Mixed Metal Oxides as Efficient Electrocatalysts for ?Electrochemical Water Splitting** **Q.01.05**

Ebrahim Sadeghi (a,b), Naeimeh Sadat Peighambardoust (a),
Sanaz Chamani (a) Umut Aydemir (a,c)

a KoÅŒ University Boron and Advanced Materials Application and Research Center (KUBAM), Sariyer, ?Istanbul, 34450, Turkey ? b Graduate School of Sciences and Engineering, KoÅŒ University, Sariyer, Istanbul, 34450, Turkey c Department of Chemistry, KoÅŒ University, Sariyer, Istanbul, 34450, Turkey

10:15 **Coffee break**

Photoelectrocatalysis I : Byungha Shin

11:00 **Rational Design of Layered Photoelectrochemical Devices for Scalable Solar Fuel Production** **Q.02.01**

Virgil Andrei

Yusuf Hamied Department of Chemistry, University of Cambridge, United Kingdom

11:30 **Ultra-Thin Hematite Films as Stable and Efficient Photoanodes for Solar Water Splitting** **Q.02.02**

Ahmed Chnani, Mario Kurniawan, Andreas Bund, and Steffen Strehle

Ahmed Chnani, Steffen Strehle: Technische Universit t Ilmenau, Institute of Micro and Nanotechnologies, Microsystems Technology Group, Max Planck Ring 12, 98693 Ilmenau, Germany
Mario Kurniawan, Andreas Bund: Technische Universit t Ilmenau, Institute of Electrochemistry and Electroplating Technology , Gustav Kirchhoff Str. 6 , 98693 Ilmenau, Germany

11:45 **Highly efficient, scalable, aerosol sprayed BiVO4/WO3 heterojunction photoelectrodes for water splitting** **Q.02.03**

Thomas Emmmler, Andreas Elsenberg, Steffen Fengler, Charline Wolpert, Mauricio Schieda, Thomas Klassen

Thomas Emmmler (Helmholtz-Zentrum Hereon, Geesthacht, Germany), Andreas Elsenberg (Helmut-Schmidt-Universit t, Hamburg, Germany), Steffen Fengler (Helmholtz-Zentrum Hereon, Geesthacht, Germany), Charline Wolpert (Helmut-Schmidt-Universit t, Hamburg, Germany), Mauricio Schieda (Helmholtz-Zentrum Hereon, Geesthacht, Germany), Thomas Klassen (Helmholtz-Zentrum Hereon, Geesthacht, Germany & Helmut-Schmidt-Universit t, Hamburg, Germany)

12:00	Enhanced photoelectrochemical water splitting performance of Bi(1+x)FeO₃ photocathodic thin films	Q.02.04
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Haozhen Yuan, Joe Briscoe
 School of Engineering and Material Science and Materials
 Research institute, Queen Mary University of London, London, E1
 4NS

12:15	Zirconium Oxynitride Thin Films for Photoelectrochemical Water Splitting	Q.02.05
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Verena Streibel, Johanna SchÄ¶necker, Laura I. Wagner, Ian D. Sharp
 Walter Schottky Institute and Physics Department, Technical
 University Munich, Garching, Germany

12:30	Lunch
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Electrocatalysis II : Joachim John

14:00	Catalysts for green energy electrochemical processes based on nanoreactor concept	Q.03.01
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J.R.Morante
 IREC Jardins de les Dones de Negre,1. Sant AdriÄ¶ del BesÄ¶s
 08930. Spain University of Barcelona, C/ MartÄ¶ FranquÄ¶s 1,
 Barcelona 08028. Spain

14:30	Bifunctional CoP/CoTe₂ Electrocatalyst for Efficient Bipolar Membrane Water Electrolysis	Q.03.02
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Isilda Amorim, Zhipeng Yu, FÄ¶tima Bento and Lifeng Liu
 Isilda Amorim, Zhipeng Yu, Lifeng Liu - Clean Energy Cluster,
 International Iberian Nanotechnology Laboratory (INL), Avenida
 Mestre Jose Veiga, 4715-330 Braga, Portugal Isilda Amorim,
 FÄ¶tima Bento - Centre of Chemistry, University of Minho, Gualtar
 Campus, Braga, 4710-057, Portugal

14:45	Modification of Mesoporous LiMn₂O₄ and LiMn₂(x)M(x)O₄ (M: Co, Ni) by SILAR Method for Efficient Water Oxidation Electrocatalysis	Q.03.03
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Irmak Karakaya , Ä¶mer Dag

Department of Chemistry, Bilkent University, Ankara 06800, Turkey. , Department of Chemistry, Bilkent University, Ankara 06800, Turkey. UNAM-National Nanotechnology Research Center, Bilkent University, Ankara 06800, Turkey.

15:00 **Development of Highly Efficient Self-Supported Transition Metal Based Catalysts for Water Splitting** **Q.03.04**

Faria Rafique, Muhammad sadaf Hussain, Dr. Joe Briscoe, Dr Habib ur Rehman

Queen Mary University of London Lahore university of the Management sciences, LUMS, Lahore, Pakistan University of the Punjab, Lahore, Pakistan

15:15 **Dual-site Alkaline HER Mechanism on In-situ Formed NiO/Ni₃S₂ Catalysts** **Q.03.05**

Xingyu Ding¹, Freddy E. Oropeza², Giulio Gorni³, Mariam Barawi², Miguel Garc a-Tecedor², Victor A. de la Pe  a O Shea², Jan P. Hofmann⁴, Jianfeng Li¹, Jun Cheng¹, Kelvin H. L. Zhang¹

¹State Key Laboratory of Physical Chemistry of Solid Surfaces, College of Chemistry and Chemical Engineering, Xiamen University, Xiamen 361005, China ²Photoactivated Processes Unit, IMDEA Energy Institute, Parque Tecnol gico de M stoles, Avda. Ram n de la Sagra 3, 28935 M stoles, Madrid, Spain. ³CELLS-ALBA Synchrotron, Carrer de la Llum 2-26, 08290 Cerdanyola del Vall s, Spain ⁴Surface Science Laboratory, Department of Materials and Earth Sciences, Technical University of Darmstadt, Otto-Berndt-Strasse 3, 64287 Darmstadt, Germany

15:30 **Coffee break**

Photoelectrocatalysis II : Athanasios Chatzitakis

16:10 **Graphene/3C-SiC Heterostructure for Solar-to-Fuel Conversion** **Q.04.01**

Jianwu Sun

Department of Physics, Chemistry and Biology (IFM), Link ping University, Link ping 58183, Sweden E-mail: jianwu.sun@liu.se

- 16:30 **WO3 photoanodes for the removal of urea from wastewater coupled to H2 production** **Q.04.02**
A. Rioja Cabanillas(1,2), P. Fernández-Ibáñez(1) , R. Hauser(2) and J.A. Byrne(1)
1 Nanotechnology and Integrated Bioengineering Centre, Ulster University, Shore Road, Newtownabbey, BT37 0QB, United Kingdom 2 Delft Intensified Materials production, Molengraaffsingel 10, 2629 JD Delft, Netherlands
- 16:45 **Synergistic effects of all-sputtered oxide, oxysulfide and noble metal overlayers on Cu₂ZnSnS₄ photoresponse for water reduction** **Q.04.03**
Yusuf Yuda Prawira^{1,2}, Theodoros Dimopoulos¹, Thomas Wicht², Selina Gäßler¹, G  nther Rupprechter², Rachmat Adhi Wibowo¹
1 AIT Austrian Institute of Technology GmbH, Center for Energy, Energy Conversion and Hydrogen, Giefinggasse 2, 1210, Vienna, Austria 2 Institute of Materials Chemistry, TU Wien, Getreidemarkt 9/BC, 1060 Vienna, Austria
- 17:00 **Charge Separation Efficiency in WO₃/BiVO₄/CoFe-PB Studied by Wavelength-Dependent Intensity-Modulated Photocurrent Spectroscopy** **Q.04.04**
Alberto Piccioni¹⁻², Pierpaolo Vecchi¹, Raffaello Mazzaro¹⁻², Michele Mazzanti³, Vito Cristino³, Stefano Caramori³, Luca Pasquini¹⁻²
1. Department of Physics and Astronomy, Universit   di Bologna, viale C. Berti Pichat 6/2, 40127 Bologna, Italy. 2. Institute for Microelectronics and Microsystems, National Research Council, via Gobetti 101, 40129, Bologna, Italy 3. Department of Chemical and Pharmaceutical Sciences, University of Ferrara, Via Fossato di Mortara 17, 44121 Ferrara, Italy
- 17:10 **Transient surface photovoltage spectroscopy of transition metal chalcogenides for solar hydrogen generation** **Q.04.05**
Farabi Bozheyev(1,2), Steffen Fengler(1), Jiri Kollmann(1), Thomas Klassen(1,3), Mauricio Schieda(1)

(1) Institute of Photoelectrochemistry, Helmholtz-Zentrum Hereon GmbH, Max-Planck-Str. 1, 21502 Geesthacht, Germany, (2) National Nanolaboratory, Al-Farabi Kazakh National University, 71 Al-Farabi Ave., 050000 Almaty, Kazakhstan, (3) Institute of Materials Technology, Helmut-Schmidt University, Holstenhofweg 85, 22043 Hamburg, Germany

17:25 **Ferroelectric-Photocatalyst Nanocomposite Thin Films for Enhanced Photoelectrocatalytic Activity** **Q.04.06**

Adriana Augurio(1), Qian Guo (1), Alberto Alvarez-Fernandez (2), Vishal Panchal (3), Bede Pittenger (4), Peter Dewolf (4), Stefan Guldin (2), Ana Belen Jorge Sobrido (1) and Joe Briscoe*(1)

(1) Queen Mary University of London, London, UK, (2) University College London, London, UK, (3) Bruker, Coventry, UK, (4) Bruker Nano Surfaces, Santa Barbara, USA,

Poster session I : Vladimir Smirnov, Byungha Shin, Joachim John

17:45 **Facile Fabrication of Metal/Oxide/Carbon Interface for Electrocatalytic Hydrogen Oxidation** **Q.P1.1**

Hyunjoong Kim, Taeghwan Hyeon
School of Chemical and Biological Engineering, Seoul National University, 08826 Seoul, Republic of Korea

17:45 **Iridium Nanoparticles Anchored on Self-Supported Cobalt-Nickel Phosphide for Oxygen Evolution Reaction in Acidic Conditions** **Q.P1.2**

Isilda Amorim, Zhipeng Yu, Fãtima Bento and Lifeng Liu
Isilda Amorim, Zhipeng Yu, Lifeng Liu - Clean Energy Cluster, International Iberian Nanotechnology Laboratory (INL), Avenida Mestre Jose Veiga, 4715-330 Braga, Portugal Isilda Amorim, Fãtima Bento - Centre of Chemistry, University of Minho, Gualtar Campus, Braga, 4710-057, Portugal

17:45 **Embedded Bi₂WO₆ microspheres in thin film as a photoelectrode material for PEC water splitting** **Q.P1.3**

Robbe Jacobs, Davino De Bruyn, Bjorn Joos, Pieter Levecque, Marlies Van Bael, Tom Breugelmans, An Hardy

UHasselt, Hasselt University, Institute for Materials Research and imec division imomec, Materials Chemistry, DESINe group, Diepenbeek, Belgium / Research Group Applied Electrochemistry & Catalysis, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium, Research Group Applied Electrochemistry & Catalysis, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium, UHasselt, Hasselt University, Institute for Materials Research and imec division imomec, Materials Chemistry, DESINe group, Diepenbeek, Belgium, Research Group Applied Electrochemistry & Catalysis, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium, UHasselt, Hasselt University, Institute for Materials Research and imec division imomec, Materials Chemistry, DESINe group, Diepenbeek, Belgium

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| 17:45 | <p>Electrodeposition of cobalt-molybdenum (tungsten) alloys in oxide melts</p> <p>Stetsyuk T.1, Malyshev V.2, Gab A.2, Shakhnin D.2, Korolkevich A.2</p> <p>1 Frantsevich Institute for Problems of Materials Science of NAS of Ukraine 2 Open International University of Human Development ?Ukraine?</p> | Q.P1.4 |
| 17:45 | <p>Hydrogen Evolution Reaction by Poly-Neutral Red Modified Electrocatalyst</p> <p>Yuya Harada, Daiki Kono, Dai Xinjie, Tsukasa Yoshida Yamagata University</p> | Q.P1.5 |
| 17:45 | <p>Electropolymerization of neutral red</p> <p>Daiki Kono¹, Yuya Harada¹, Xinjie Dai¹, Tsukasa Yoshida¹</p> <p>¹.Yamagata University</p> | Q.P1.6 |
| 17:45 | <p>Synthesis, characteristics and photocatalytic properties of Ag₃PO₄</p> <p>Olga Malinowska, dr Kamila Zar?bska</p> <p>University of Warsaw</p> | Q.P1.7 |

17:45

Exsolved nanoparticles, galvanically restructured for tunable photo-electrocatalytic energy conversion

Q.P1.8

Xiaolan Kang (1), Vilde Mari Reinertsen (2), Kevin Gregor Both (1), Augustinas Galeckas (2), Thomas Aarholt (2), Årystein Prytz (2), Truls Norby (1), Dragos Neagu (3), Athanasios Chatzitakis (1)*

(1) Centre for Materials Science and Nanotechnology, Department of Chemistry, University of Oslo, Gaustadalléen 21, NO-0349 Oslo, Norway, (2) Centre for Materials Science and Nanotechnology, Department of Physics, University of Oslo, P. O. Box 1048 Blindern, NO-0316, Oslo, Norway, (3) Department of Chemical and Process Engineering, University of Strathclyde, 75 Montrose St, G1 1XJ, Glasgow, United Kingdom

17:45

2D model surface nanoarchitectures for improved kinetics of vanadium redox couples

Q.P1.9

Maida Aysla Costa de Oliveira¹, Hugo Nolan¹, Christian Schröder¹, Marc Brunet-Cabrera¹, Kim McKelvey^{1,2} and Paula E. Colavita¹

¹School of Chemistry, Trinity College Dublin and ²School of Chemical and Physical Science, Victoria University of Wellington College Green, Dublin 2, Ireland costadem@tcd.ie

TUESDAY, 20 SEPTEMBER 2022

Electrocatalysis III : Salvador Eslava

9:00

Beyond Classical: New Experimental Tools to Test (Photo)-Electrocatalyst Performance

Q.06.01

Serhiy Cherevko

Helmholtz-Institute Erlangen-Nuremberg for Renewable Energy (IEK-11), Forschungszentrum Jülich Cauerstr. 1, 91058, Erlangen, Germany

9:30

Metal organic framework derived iridium-iron diatomic active sites for efficient bifunctional oxygen electrocatalysis

Q.06.02

Zhipeng Yu,^{a,b,c} Chaowei Si,^d Alec P. LaGrow,^a Zhixin Tai,^a Wolfgang A. Caliebe,^e Akhil Tayal,^e Maria J. Sampaio,^{b,c} Juliana P.S. Sousa,^a Isilda Amorim,^a Ana Araujo,^{a,b,c} Joaquim L. Faria,^{b,c} Junyuan Xu,^{a,g,*} Bo Li,^{d,*} and Lifeng Liua,^{*}

^a International Iberian Nanotechnology Laboratory (INL), Avenida Mestre Jose Veiga, 4715-330 Braga, Portugal ^b Laboratory of Catalysis and Materials (LSRE-LCM), Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal ^c Associate Laboratory in Chemical Engineering, Faculty of Engineering (ALiCE), University of Porto, Rua Dr. Roberto Frias s/n 4200-465 Porto, Portugal ^d Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, Shenyang 110016, China ^e Deutsches Elektronen-Synchrotron DESY, NotkestraÙe 85, D-22607 Hamburg, Germany ^g Laboratory of Advanced Spectro-electrochemistry and Li-ion Batteries, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, 116023 Dalian, China.

9:45

Stability of High Entropy Alloy Electrocatalysts at various pH

Q.06.03

Tatiana Priamushko, Attila KormÁnyos, Rebecca Pittkowski, Qi Dong, Bin Xiao, Maria Minichova, Valentin Briega-Martos, Alan Savan, Ken J. Jenewein, Thomas BÄhlh, Liangbing Hu, Alfred Ludwig, Matthias Arenz, Serhiy Cherevko

Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Forschungszentrum Jülich, 91058 Erlangen, Germany, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Forschungszentrum Jülich, 91058 Erlangen, Germany, Department of Chemistry, University of Copenhagen, DK-2100 Copenhagen O, Denmark, Department of Materials Science and Engineering, University of Maryland, College Park, MD 20742, USA, Materials Discovery and Interfaces, Institute for Materials, Ruhr-Universität Bochum, 44801 Bochum, Germany, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Forschungszentrum Jülich, 91058 Erlangen, Germany, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Forschungszentrum Jülich, 91058 Erlangen, Germany, Materials Discovery and Interfaces, Institute for Materials, Ruhr-Universität Bochum, 44801 Bochum, Germany, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Forschungszentrum Jülich, 91058 Erlangen, Germany, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Forschungszentrum Jülich, 91058 Erlangen, Germany, Department of Materials Science and Engineering, University of Maryland, College Park, MD 20742, USA, Materials Discovery and Interfaces, Institute for Materials, Ruhr-Universität Bochum, 44801 Bochum, Germany, NanoElectroCatalysis Group, Department of Chemistry, Biochemistry and Pharmaceutical Sciences, University of Bern, 3012 Bern, Switzerland, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Forschungszentrum Jülich, 91058 Erlangen, Germany.

10:00

Stable Pt nanoclusters on MoS₂ slabs for electrocatalytic water splitting

Q.06.04

Tamás Ollás^{1*}, Antal A. Kocsis², Péter Vancsó², Zakhar I. Popov³, Gergely Dobrik², Pavel B. Sorokin³, and Levente Tapasztás²

¹ Centre for Energy Research, Institute for Energy Security and Environmental Safety, Surface Chemistry and Catalysis Department, Centre for Energy Research, 1121 Budapest, Hungary, ² Centre for Energy Research, Institute of Technical Physics and Materials Science, 1121 Budapest, Hungary, ³ National University of Science and Technology MISiS, 119049 Moscow, Russia

10:15 **Engineered Highly Efficient and Earth-abundant Metal-based Boride Electrocatalyst for Water Electrolysis** **Q.06.05**

Dr. Jean Marie Vianney Nsanzimana, Prof. Benjamin Butz, Prof. Manuela Killian, Dr. Julian Muller, Dr. Sina Hejazi, Dr. Yilmaz Sakalli, Marco Hepp, Charles Ogolla, and Dr. Christian Wiktor.

University of Siegen

10:30 **Coffee break**

Photoelectrocatalysis III : Nina Plankensteiner, Joachim John

11:00 **Loving the Alien: CO₂ deserves our affection but save a seat for some other surprising climate change allies** **Q.07.01**

Jan Mertens

Engie, Simon Bolivar Laan 34, 1000 Brussels, Belgium Ghent University, Ghent, Belgium

11:30 **Development and tuning of photoanodes for solar fuels and feedstocks** **Q.07.02**

Salvador Eslava

Department of Chemical Engineering, Imperial College London, United Kingdom

11:50 **Effect of BaTiO₃ polarisation on photocurrent generation and charge carrier dynamics in ferroelectric photoanodes for photoelectrochemical water splitting** **Q.07.03**

Chloe Forrester,^a Adriana Augurio,^a James Durrant,^b Joe Briscoe^a

^a Queen Mary University of London, London, UK, ^b Imperial College London, London, UK

12:05 **Bilayered CuBi₂O₄/CuO nanocomposite films for photoelectrochemical CO₂ reduction** **Q.07.04**

Ian Lorenzo E. Gonzaga, Candy C. Mercado

Department of Engineering Science, University of the Philippines
 Los Baños, Department of Mining, Metallurgical, and Materials
 Engineering, University of the Philippines Diliman, Department of
 Mining, Metallurgical, and Materials Engineering, University of the
 Philippines Diliman

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|-------|---|---------|
| 12:20 | <p>Zig-zag Ag₂S nanostructures for superior optical absorption and photoelectrochemical water splitting performance</p> <p>JYOTI YADAV, PARUL RATURI, SARJANA YADAV, J.P.SINGH</p> | Q.07.06 |
| 12:35 | <p>IIT DELHI</p> <p>Photoelectrochemical Conversion of biomass derivatives by Nanostructured Ti-doped hematite photoanodes</p> <p>Raffaello Mazzaro(a,b), Irene Carrai(a), Alberto Piccioni(a,b), Pierpaolo Vecchi(a), Giacomo Morselli(c), Elena Bassan(c), Paola Ceroni(c), Silvia Grandi(d), Serena Berardi(d), Stefano Caramori(d), Luca Pasquini(a,b).</p> <p>(a) Department of Physics and Astronomy, University of Bologna, Viale Berti Pichat 6/2, 40127, Bologna, Italy (b) Institute for Microelectronics and Microsystems, National Research Council, via Gobetti 101, 40129, Bologna, Italy (c) Department Chemistry, University of Bologna, Selmi 2, 40129, Bologna, Italy (d) Department of Chemical and Pharmaceutical Sciences, University of Ferrara, Via Fossato di Mortara 17, 44121 Ferrara, Italy</p> | Q.07.07 |
| 12:50 | <p>Photoelectrochemical CO₂ reduction using Ag_xCu_{100-x} bimetallic nanoparticles supported on Si micropillars (SiMPs)</p> <p>Harsh Chaliyawala¹, Labibe Soilihi¹, Diane Muller-Bouvet¹, Christine Cachet-Vivier¹, Stephane Bastide¹, Tarik Bourouina², Frédéric Marty², Abir Rezgui², Sylvain Le Gall³, Encarnacion Torralba^{1*}</p> | Q.07.05 |

(1) Univ Paris Est Creteil, CNRS, Institut de Chimie et des Matériaux Paris-Est (ICMPE), UMR 7182, 2 rue Henri Dunant, 94320 Thiais, France (2) ESYCOM - Electronique, Systèmes de communication et Microsystèmes (Université de Paris-Est - Marne-la-Vallée) Cité Descartes, 77454 Marne-la-Vallée Cedex 2, France (3) Group of electrical engineering Paris, UMR CNRS 8507, Centrale Supélec, (Univ. Paris Sud) 91192 Gif sur Yvette CEDEX, France

13:05

Lunch

Electrocatalysis IV : Mihalís Tsampas

14:00

Sustainable hydrogen generation using photovoltaic operated water electrolysis with non-platinum group catalysts

Q.08.01

Dr Sonya Calnan

Competence Centre Photovoltaics Berlin (PVcomB), Helmholtz-Zentrum Berlin für Materialien und Energie, Schwarzschildstraße 3, 12489 Berlin, Germany

14:30

Low resistivity Ru layers via CVD from a new Ru precursor: Thin film assessment for electrocatalysis applications

Q.08.03

David Zanders, Jan-Lucas Were, Jorit Obenlänges, Michael Gock, Anjana Devi

Inorganic Materials Chemistry, Ruhr University Bochum, Universitätsstraße 150, Bochum, Germany 44780 (for DZ, JLW, JO, AD) Global Business Unit Heraeus Precious Metals, Heraeus Deutschland GmbH & Co. KG, Heraeusstraße 12-14, Hanau, Germany 63450 (for MG)

14:45

Bismuth single atom catalysts for tuning C1 products of CO2RR

Q.08.04

Saswati Santra¹, Verena Streibel¹, Siyuan Zhang² and Ian D. Sharp^{1*}

¹Walter Schottky Institute and Physics Department, Technical University of Munich, Am Coulombwall 4, Garching, 85748 Germany ²Max-Planck-Institut für Eisenforschung, Max-Planck-Straße 1, D-40237, Germany

15:00 **Operando Proton Transfer Reaction-Time of Flight-Mass Spectrometry of Carbon Dioxide Reduction Electrocatalysis** **Q.08.05**

Hangjuan Ren, Shik Chi Edman TSANG, Alexei A. Lapkin, Joel W. Ager
University of Oxford, University of Oxford, University of Cambridge, Lawrence Berkeley National Laboratory, University of California, Berkeley

15:15 **Coffee break**

Electrocatalysis V : Jianwu Sun

16:00 **Catalyst-coated membranes for PEM water electrolysis fabricated with spark ablation** **Q.09.01**

M.N. Tsampas¹, M. Lavoretti¹, W. L. Vrijburg², S. Dimitriadou², T. V. Pfeiffer², F.M. Sapountzi^{1,3}
1 Dutch Institute For Fundamental Energy Research (DIFFER), De Zaaie 20, 5612 AJ, Eindhoven, the Netherlands 2 VSPARTICLE BV, Molengraaffsingel 10, 2629 JD, Delft, the Netherlands 3 Syngaschem BV, Syncat@DIFFER, PO Box 6336, 5600 HH, Eindhoven, the Netherlands

16:20 **Regular nanopatterns and ordered high surface area nanostructures for CO₂ reduction and water electrolysis** **Q.09.02**

Nina Plankensteiner [1,2] Tibor Kuna [1], Alexandra Galetova [1,3] Anna Staerz [1], Rico Rupp [1], Patrick Steegstra [1], Joachim John [1], Philippe M. Vereecken [1,2]

[1] Imec, Kapeldreef 75, 3001 Leuven, Belgium [2] KU Leuven, cMACS, Celestijnenlaan 200F, 3001 Leuven, Belgium [3] Chemistry Department, KU Leuven, Celestijnenlaan 200f, 3001 Heverlee, Belgium

16:40 **Electrochemical oxidation of urea by Ni-Cu alloy** **Q.09.03**

Dr. rer. nat. Karuppasamy Dharmaraj, Rania Hanna, Prof. Dr. Rutger Schlatmann, Dr. Sonya Calnan
Institut Kompetenz-Zentrum Photovoltaik Berlin (PVcomB), Helmholtz-Zentrum Berlin für Materialien und Energie, Schwarzschildstraße 3, 12489 Berlin, Germany

16:55 **Electroenzymatic CO₂ reduction on nanostructured electrodes functionalized with recombinant carbon monoxide dehydrogenases** **Q.09.04**

Jonas Englhard(1), Rebecca B  hrle(2), Stefanie B  hnke-Brandt(2), Mirjam Perner(2), Julien Bachmann(1)

(1) Department of Chemistry and Pharmacy, Friedrich-Alexander University of Erlangen-N  rnberg, Cauerstrasse 3, D - 91058 Erlangen, Germany (2) Geomicrobiology, GEOMAR Helmholtz Centre for Ocean Research Kiel, Wischhofstr. 1-3, D - 24148 Kiel

17:10 **Mechanistic Clarification of Copper Dissolution in the Phosphate Buffer at Open Circuit Potential** **Q.09.05**

Anna Staerz, Nina Plankensteiner, Stanley Bus, Alexandra Galetova, Sukhvinder Singh, Maarten Mees, Philippe M. Vereecken

IMEC, Leuven, 3000, Belgium: KU Leuven, Leuven, 3001, Belgium

17:25 **Coffee break**

Poster session II : Vladimir Smirnov, Byungha Shin, Joachim John

17:30 **Prussian Blue Analog Catalyst of Mesoporous K-doped NiCo₂O₄ for Improved Oxygen Evolution** **Q.09.06**

Nam-Woon Kim, Jeong Bae Kim, Jihun Oh, Hyunung Yu
Nam-Woon Kim, Jeong Bae Kim, Hyunung Yu-Korea Research Institute of Standards and Science (KRISS), Daejeon 34113, Republic of Korea ,Jihun Oh-Korea Advanced Institute of Science and Technology (KAIST), Daejeon 34141, Republic of Korea

17:30 **3D-printed Cu₂O photoelectrodes for photoelectrochemical water splitting** **Q.09.07**

Sanghyeon Lee
Yonsei University KIURI Institute

17:30 **Synthesis and studies of carbon-based porous nanocomposite electrode materials as electrocatalysts for organic transformations** **Q.09.08**

Filippo Pota, Christian Schroder, Swapnil Ingle, Hugo Noland, Paula E. Colavita
School of Chemistry, Trinity College Dublin

17:30	Photocatalytic and electrocatalytic hydrogen production performances of hydrothermally synthesized mixed metal oxide composites Karthik Kannan^{1,2}, Debabrata Chanda^{1,2}, Jagadis Gautam^{1,2}, Mikiyas Mekete Meshesha^{1,2}, Jang Seok Gwon^{1,2}, Myungsik Choi³, BeeLyong Yang^{1,2*} 1. School of Advanced Materials Science and Engineering, Kumoh National Institute of Technology, 61 Daehak-ro, Gumi-si, Gyeongbuk, 39177, Republic of Korea 2. GHS Co., Ltd. Gumi-si, Republic of Korea. 3. SJ Tech. Co., Ltd, 1026-1 Daecheon-Dong, Dalseo-Gu, Daegu City, Republic of Korea *Corresponding author: Tel: +82-(54)-478-7741, E-mail: blyang@kumoh.ac.kr	Q.09.09
17:30	Efficient saline water electrolysis enabled by under-coordinated metal active sites and heterointerfaces over NiFeSP electrode Zhipeng Yu,^{a,b,c} Yifan Li,^d Vlad M. Diaconescu,^e Laura Simonelli,^e Jonathan R. Esquiús,^a Isilda Amorim,^a Ana Araujo,^{a,b,c} Joaquim L. Faria,^{b,c} and Lifeng Liu,^{a,*} ^a Clean Energy Cluster, International Iberian Nanotechnology Laboratory (INL), Av. Mestre Jose Veiga, 4715-330 Braga, Portugal ^b Laboratory of Separation and Reaction Engineering ? Laboratory of Catalysis and Materials (LSRE-LCM), Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias s/n 4200-465 Porto, Portugal ^c Associate Laboratory in Chemical Engineering, Faculty of Engineering (ALiCE), University of Porto, Rua Dr. Roberto Frias s/n 4200-465 Porto, Portugal ^d School of Environmental and Municipal Engineering, Qingdao University of Technology, Qingdao 266033, P.R. China ^e ALBA Synchrotron, Carrer Llum 2-26, Cerdanyola del Valles, Barcelona 08290, Spain	Q.09.10
17:30	Electropolymerization of new fullerene derivatives Kamila Zarębska, Piotr Piotrowski, Magdalena Skompska University of Warsaw, Faculty of Chemistry	Q.09.11
17:30	New strategy of preparation of photoelectrocatalysts for water splitting utilizing electrodeposition of tungsten alloys	Q.09.12

Tomasz K. Ratajczyk, Krzysztof Miecznikowski, Mikołaj Dónten

Warsaw University, Faculty of Chemistry (all)

17:30 **Electrodeposition of Copper (I) oxide/organic dyes hybrid thin films** **Q.09.13**

Haruto Morinaga, Tensho Nakamura, Hana Kudo, Tsukasa Yoshida.

Yamagata University

17:30 **Bias-free solar hydrogen production in a zero gap PEC cell with abundant electrode materials and polymeric electrolyte membranes** **Q.09.14**

Pramod. Kunturu¹, M. Lavoretti¹, P. Varadhan¹, S. Bera¹, H. Johnson², S. King², M.C.M. van de Sanden^{1,3}, M.N. Tsampas¹

¹ Dutch Institute for Fundamental Energy Research (DIFFER), 5612AJ Eindhoven, the Netherlands ² Toyota Motor Europe NV/SA, Hoge Wei 33, 1930 Zaventem, Belgium ³ Department of Applied Physics, Eindhoven University of Technology, 5600 MB Eindhoven, the Netherlands

17:30 **Water splitting with MoS₂ and PdSe₂** **Q.09.15**

Edward Allery David Baker, Joe Pitfield, Conor Jason Price, Steven Paul Hepplestone

Department of Physics, University of Exeter, Exeter, EX4 4QL, UK

WEDNESDAY, 21 SEPTEMBER 2022

12:30 **Lunch**

Photoelectrocatalysis IV : Vladimir Smirnov

14:00 **Water Vapor Photoelectrolysis in an All Solid-State Photoelectrochemical Cell** **Q.11.01**

Kang Xiaolan,⁽¹⁾ Chaperman Larissa,⁽²⁾ Galeckas Augustinas,⁽³⁾ Merah Souad Ammar,⁽²⁾ Mammeri Fayna,⁽²⁾ Norby Truls,⁽¹⁾ Chatzitakis Athanasios,⁽¹⁾

(1) Centre for Materials Science and Nanotechnology, Department of Chemistry, University of Oslo, Oslo, Norway, (2) Interfaces Traitements Organisation et Dynamique des Systèmes (ITODYS), Université de Paris, Paris, France, (3) Centre for Materials Science and Nanotechnology, Department of Physics, University of Oslo, Oslo, Norway

14:20 **Turning ambient air humidity into hydrogen by sunlight** **Q.11.02**

Marek Lavorenti (1), Pramod Kunturu (1), Purushothaman Varadhan (1), Hannah Johnson (2), Michail N. Tsampas (1)
1) Dutch Institute for Fundamental Energy Research (DIFFER), 5612AJ Eindhoven, the Netherlands 2) Toyota Motor Europe NV/SA, Hoge Wei 33, 1930 Zaventem, Belgium

14:35 **Mechanism of photochemical and photoelectrochemical degradation of organic pollutants with BiVO₄, BiVO₄/Co-Pi and BiVO₄/g-C₃N₄** **Q.11.03**

T.??cki, H. Hamad, K. Zar??bska, E. Kwiatkowska, M. Skompska

University of Warsaw, Advanced Technology and New Materials Research Institute, University of Warsaw, University of Warsaw, University of Warsaw

14:50 **Aqueous solution-gel: a versatile synthesis route for photoelectrodes for water splitting and CO₂ conversion** **Q.11.04**

A. Hardy 1, B. Joos 1, N. Debusschere 1, R. Jacobs^{1,2}, M.K. Van Bael 1

1 UHasselt, Institute for Materials Research and imec division imomec, Materials Chemistry, DESINE group, Diepenbeek, Belgium 2 UAntwerp, ELCAT, Applied electrochemistry and catalysis, Wilrijk, Antwerp

15:05 **Quantifying the photoanodic stability of TiO₂ protection layers coated by atomic layer deposition** **Q.11.05**

Jiri Kollmann(1), Herman Kriegel(1), Ragle Raudsepp(1), Maryam Pourmahdavi(1), Thomas Klassen(1,2), Mauricio Schieda(1)

(1) Helmholtz-Zentrum Hereon, Max-Planck-Str. 1, 21502 Geesthacht, Germany, (2) Helmut-Schmidt University, Holstenhofweg 85, 22043 Hamburg, Germany

15:20

Two Dimensional MAX Supported Copper Oxide/Nickel Oxide/MAX as an Efficient and Novel Photocatalyst for Hydrogen Evolution

Q.11.06

Karthik Kannan^{1,2}, Debabrata Chanda^{1,2}, Jagadis Gautam^{1,2}, Mikiyas Mekete Meshesha^{1,2}, Jang Seok Gwon^{1,2}, Myungsik Choi³, BeeLyong Yang^{1,2*}

1. School of Advanced Materials Science and Engineering, Kumoh National Institute of Technology, 61 Daehak-ro, Gumi-si, Gyeongbuk, 39177, Republic of Korea 2. GHS Co., Ltd. Gumi-si, Republic of Korea. 3. SJ Tech. Co., Ltd, 1026-1 Daecheon-Dong, Dalseo-Gu, Daegu City, Republic of Korea *Corresponding author: Tel: +82-(54)-478-7741, E-mail: blyang@kumoh.ac.kr

15:35

Coffee break

Photocatalysis V : Joachim John

16:00

Interfacing photosynthetic proteins with novel transparent electrode materials

Q.12.01

Joanna Kargul

Solar Fuels Laboratory, Centre of New Technologies, University of Warsaw, Banacha 2C, 02-097 Warsaw, Poland

16:30

Photocatalytic and photoelectrocatalytic properties of graphitic C₃N₄ and reduced C₃N₄.

Q.12.02

Ewelina Kwiatkowska, Tomasz ??cki, Bartosz Furtak, Magdalena Skompska

Faculty of Chemistry, University of Warsaw Pasteura 1 02-093 Warsaw

16:45

Nickel-based plasmonic core@shell hybrid nanostructure for photocatalytic hydrogen evolution

Q.12.03

Parisa Talebi¹, Harishchandra Singh¹, Ekta Rani¹, Vladimir Pankratov², Viktorija Pankratova^{2,1}, and Wei Cao¹

1Nano and Molecular Systems Research Unit, University of Oulu, FIN-90014, Finland, 2 Institute of Solid-State Physics, University of Latvia, 8 Kengaraga iela, 1063 Riga, Latvia,

17:00 **Investigation of the novel, nature inspired PDA/TiO₂ laminar composites- photocatalytic properties and multilayer approach** **Q.12.04**

Jakub Szewczyk^{1&2}, Marcin ZiÅł?ek³, Igor Iatsunskiy¹, Katarzyna Siuzdak⁴, Syreina Sayegh², Fida Tanos^{2&5}, Mikhael Bechelany², Emerson Coy¹

1NanoBioMedical Centre, Adam Mickiewicz University, Wszechnicy Piastowskiej 3, 61-614, Pozna?, Poland, 2Institut Europeen des Membranes, IEM, UMR 5635, Univ Montpellier, ENSCM, Centre national de recherche scientifique (CNRS), Place Eugene Bataillon, 34095 Montpellier, France, 3Faculty of Physics, Adam Mickiewicz University, ul. Uniwersytetu Pozna?skiego 2, 61-614, Pozna?, Poland, 4Centre of Laser and Plasma Engineering, The Szewalski Institute of Fluid-Flow Machinery, Fiszer 14 Str., 80-231 Gdansk, Poland, 5Laboratoire d'Analyses Chimiques, Faculty of Sciences, LAC-Lebanese University, Jdeidet 90656, Lebanon

17:15 **Reduced bandgap and enhanced photocatalysis in ZrO₂/TiO₂ core/shell nanoparticles** **Q.12.05**

Greg Swadener
Aston University

17:30 **A Flexible Piezo-catalyst PVDF-TiO₂ Nanofibrous Membrane for Intelligent Photocatalytic Performance** **Q.12.06**

Jiayi Yina, Martina Rosoa, Michele Modesti
University of Padova, Department of Industrial Engineering, Via Marzolo, 9, 35131 Padova Italy.

THURSDAY, 22 SEPTMBER 2022

Catalysis synthesis and characterization : Byungha Shin

9:00 **A facile dry synthesis of catalytic ultrathin and highly porous metal mesh films** **Q.13.01**

Hannah-Noa Barad, Hyunah Kwon, Alex Ricardo Silva Olaya, Mariana AlÃ?rcon-Correa, Gunther Wittstock, Peer Fischer

Hannah-Noa Barad, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, and Department of Chemistry, Center of Nanotechnology & Advanced Materials, Bar Ilan University, Ramat Gan, Israel, Hyunah Kwon, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, and Institute for Molecular Systems Engineering, Heidelberg University, Heidelberg, Germany, Alex Ricardo Silva Olaya, School of Mathematics and Science, Department of Chemistry, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany, Mariana AlÃƒrcon-Correa, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, and Institute for Molecular Systems Engineering, Heidelberg University, Heidelberg, Germany, Gunther Wittstock, School of Mathematics and Science, Department of Chemistry, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany, Peer Fischer, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, and Institute for Molecular Systems Engineering, Heidelberg University, Heidelberg, Germany,

9:15

Combinatorial deposition of oxide semiconductors by spray pyrolysis for accelerated material screening and optimization **Q.13.02**

Maximilian Wolf, Theodoros Dimopoulos
AIT Austrian Institute of Technology, Center for Energy, Energy Conversion and Hydrogen, 1210 Wien, Austria. TU Wien, Institut fÃƒr Materialchemie, 1060 Wien, Austria., AIT Austrian Institute of Technology, Center for Energy, Energy Conversion and Hydrogen, 1210 Wien, Austria.

9:30

Phase control of TiO2 nanoparticles from gas aggregation cluster source **Q.13.03**

Marie Elis, Marius Kamp, Martin Hicke, Jonas Drewes, Franz Faupel, Oral Cenk Aktas, Salih Veziroglu, Lorenz Kienle

AG-Synthesis and Real Structure, Institute for Materials Science, Technical Faculty of the Christian-Albrechts-University of Kiel, Kaiserstrasse 2, 24143 Kiel, Germany, AG-Synthesis and Real Structure, Institute for Materials Science, Technical Faculty of the Christian-Albrechts-University of Kiel, Kaiserstrasse 2, 24143 Kiel, Germany, AG-Multicomponent Materials, Institute for Materials Science, Technical Faculty of the Christian-Albrechts-University of Kiel, Kaiserstrasse 2, 24143 Kiel, Germany, AG-Multicomponent Materials, Institute for Materials Science, Technical Faculty of the Christian-Albrechts-University of Kiel, Kaiserstrasse 2, 24143 Kiel, Germany, AG-Multicomponent Materials, Institute for Materials Science, Technical Faculty of the Christian-Albrechts-University of Kiel, Kaiserstrasse 2, 24143 Kiel, Germany, AG-Multicomponent Materials, Institute for Materials Science, Technical Faculty of the Christian-Albrechts-University of Kiel, Kaiserstrasse 2, 24143 Kiel, Germany, AG-Multicomponent Materials, Institute for Materials Science, Technical Faculty of the Christian-Albrechts-University of Kiel, Kaiserstrasse 2, 24143 Kiel, Germany, AG-Synthesis and Real Structure, Institute for Materials Science, Technical Faculty of the Christian-Albrechts-University of Kiel, Kaiserstrasse 2, 24143 Kiel, Germany

9:45

Real time electrodeposition of PtNi nanograined film using LC-TEM

Q.13.04

Tomasz Tarnawski, Joanna Depciuch-Czarny, Mirosława Pawlyta, Robin Schaeublin, Kamil Sobczak, Magdalena Parlińska-Wojtan

Institute of Nuclear Physics Polish Academy of Sciences, PL-31-342 Krakow, Poland, Institute of Nuclear Physics Polish Academy of Sciences, PL-31-342 Krakow, Poland, Silesian University of Technology, Institute of Engineering Materials and Biomaterials, Konarskiego 18A, 44100 Gliwice, Poland, ScopeM-Scientific Center for Optical and Electron Microscopy, ETH Zürich, 8093 Zürich, Switzerland, Faculty of Chemistry, Biological and Chemical Research Centre, Warsaw, Poland

10:00

Using reversible redox probes to determine band edge locations of semiconductor thin films

Q.13.05

Divyansh Khurana, Nina Plankensteiner, Philippe Vereecken

cMACS, KULeuven, Leuven 3001, Belgium imec, Leuven 3001, Belgium , cMACS, KULeuven, Leuven 3001, Belgium imec, Leuven 3001, Belgium , cMACS, KULeuven, Leuven 3001, Belgium imec, Leuven 3001, Belgium

10:15 **Irreversible compositional dynamics on the surface of PtNi alloy under alternating redox environments** **Q.13.06**

Ivan Khalakhan, Xianxian Xie, Mykhailo Vorokhta, Iva Matoláčnová

Charles University, Faculty of Mathematics and Physics,
Department of Surface and Plasma Science, V Holešovičkách 2,
18000 Prague, Czech Republic

10:30 **Award ceremony of the Best Oral/Poster Prizes and closing remarks**



Satellite Events

Workshop on Material recycling and circular economy

21 September 2022, Warsaw, Poland, 09:00-17:15

EVENT location: room 206 | Main Building

Chairman of the working group:

Jacques Amouroux, E-MRS, Amaya Igartua, EUMAT Co-secretary, Tekniker, Malek Benmansour, CEA, Juan Ramon Morante, IREC, Jan Meveve, Circular Economy working group EUMAT (VITO), Paul Siffert, E-MRS coordinator.

Goal and strategy:

Recycling is becoming an international challenge for the economic competition using materials. Today, the treatment of the waste materials needs new processes and new education because the knowledge of deconstruction of our complex multilayers materials become much more complicated than expected. Our workshop has as objective to identify some important fields of development in agreement with the EC policy and open a new knowledge with industrial developments;

Preliminary agenda - Wednesday September 21:

08.45	Registration
09.00-09.30	General introduction from the data of ACS Materials and recycling Jacques Amouroux, E-MRS
09.30-10.00	The Materials Manifesto Roadmap & challenges in circular economy. Activities in recycling - Amaya Igartua, TEKNIKER, EUMAT
10:00-10:30	Challenges for a sustainable green deal approach Rodrigo Ferrao de Paiva Martins, CEMOP, UNINOVA
10.30-10.45	Coffee break
10.45-11.15	Circular business models for the solar power industry Bart Mantels, VITO
11.15-11.45	Green materials for a green hydrogen circular economy Anke Weidenkaff, Andrea Gassmann, Emanuel Ionesco and Eva Brouwer

Leistungszentrum Wasserstoff Fraunhofer IWKS and TU Darmstadt

11.45-12.15 Recovery of high purity silicon from PV waste via a new chemical method
Matyas Torok, Bay Zoltan, Budapest, Hungary

12.15-12.40 **First round table on circular economy and recycling**

12.40-13.50 Lunch time

Session 2: Carbon recycling and material recycling: a challenge

13.50-14.00 Brief introduction

14.00-14.30 Carbon recycling from CO₂ to Hydrocarbon through Plasma catalysis
Vincent Piepiora and Maria Mikhael, Start Up Energy green Chimie Paris

14.30-15.00 Antimony recycling from new scientific proposals and industrial development
Frederic Rousseau and Morvan Gaudin, Chimie Paris tech PSL

15.00-15.30 Catalytic materials to improve Carbon recycling of municipal waste with
energy recovery and circular carbon economy
J.R Morante, IREC

15.30-16.00 Circular economy on Lithium-ion batteries
A. Martinez, F. Clarens, Eurecat

16.00-16.45 **Main conclusions and round table:** economic aspects and environmental challenges
Chairs: Jacques Amouroux and Amaya Igartua

- Results and proposals for technical aspects for carbon recycling as a raw material
- Energy and water consumption during recycling processes
- Education proposals and international meetings with ICSU for an exchange of knowledge and the opening of a new discipline
- New international diploma for a global education including chemical engineering economic data ,water consumption and environmental knowledge

16.45-17.15 **General conclusions and recommendations**
Paul Siffert, Amaya Igartua, Rodrigo Ferrao de Paiva Martins

Thesis competition

19-20 September 2022, Warsaw, Poland, 12:45-13:45

EVENT location: room 208 | Main Building

We will be running a competition for current doctoral students in which we will ask them to present their doctoral research in no longer than three minutes using no more than three overhead slides.

Sessions will run during lunch breaks, and all E-MRS delegates are invited to attend. There will be a small judging committee who will decide on which presentations are the best, based on the clarity of presentation, the quality of the science, and the level of technical understanding that the presenter demonstrates. Presentations should include details of the motivation for the research, the results achieved so far, the potential impact of the work, and what conclusions have been drawn to date.

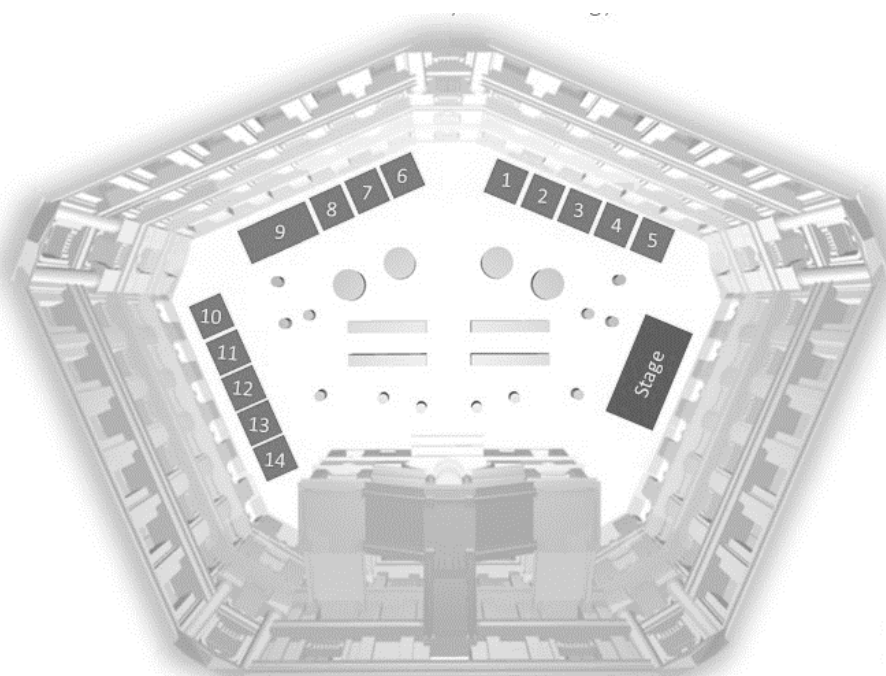
Detailed programme will be available during the conference.



Exhibition

19-21 September 2022, 09:00-17:15

Location: **Main Hall | Main Building**



Warsaw University
of Technology



Entrance

Exhibitors

Booth No.	Company Name
1	SAES
2	Spectro Inlets
3	IOP Publishing
4	Łukasiewicz – Institute of Microelectronics and Photonics
5	RADIATE/UK National Ion Beam Centre
6	PalmSens BV
7	Royal Society of Chemistry
8	KAUST
9	Nextron
10	ATLANT 3D Nanosystems
11	neaspec – attocube
12	SEMILAB
13	SYGNIS
14	NKT Photonics by Eurotek International