

CONFERENCE PROGRAMME



15th - 18th September

€·MRS 2025 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

15 - 18 September



2025 FALL MEETING

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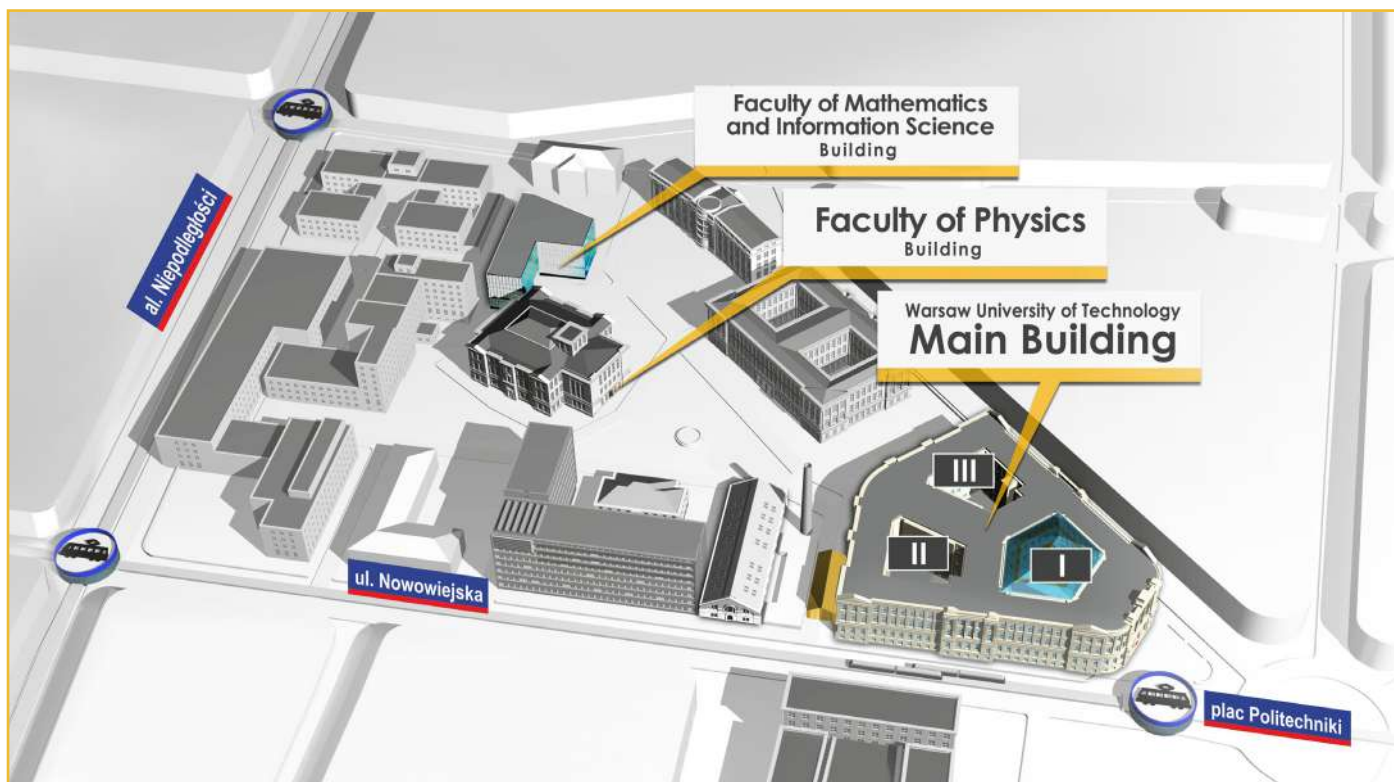
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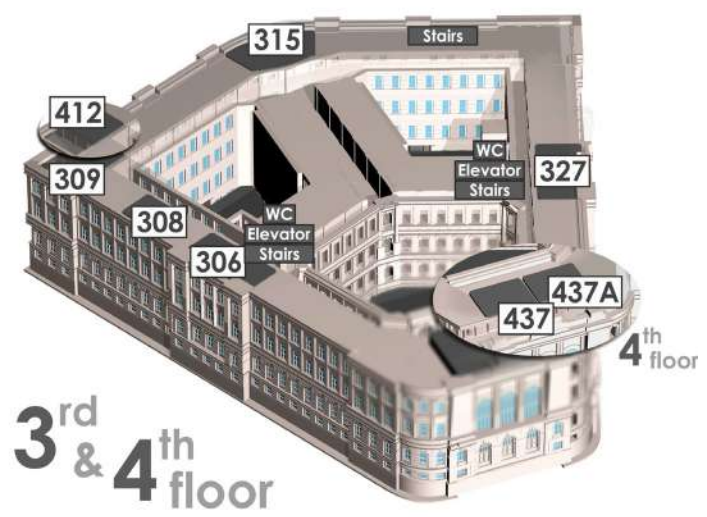
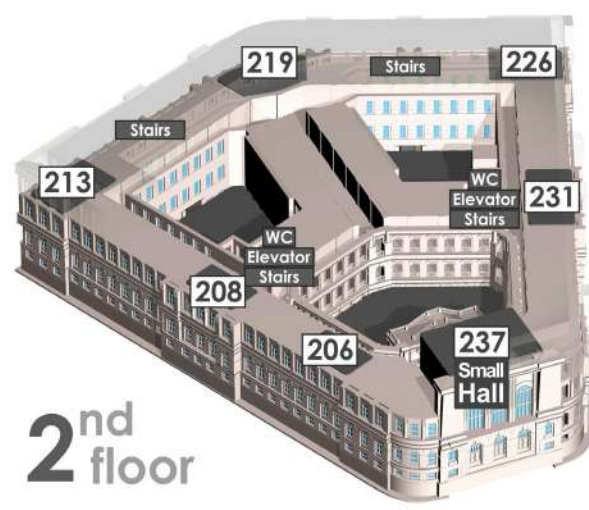
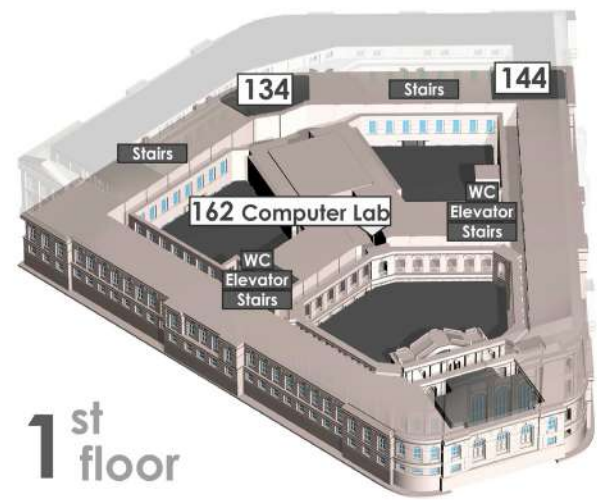
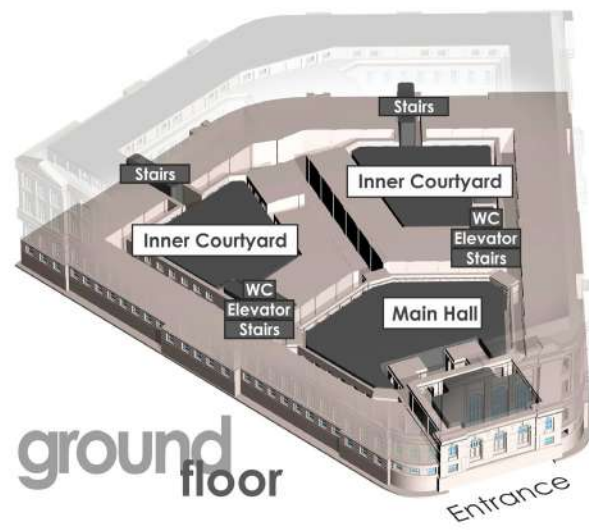
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Germany

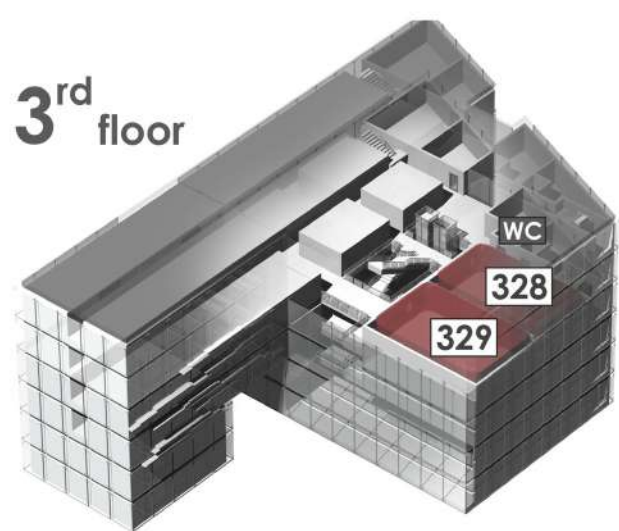
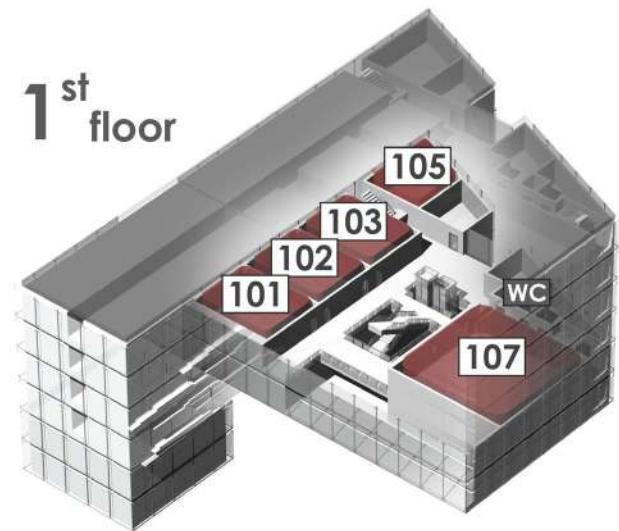
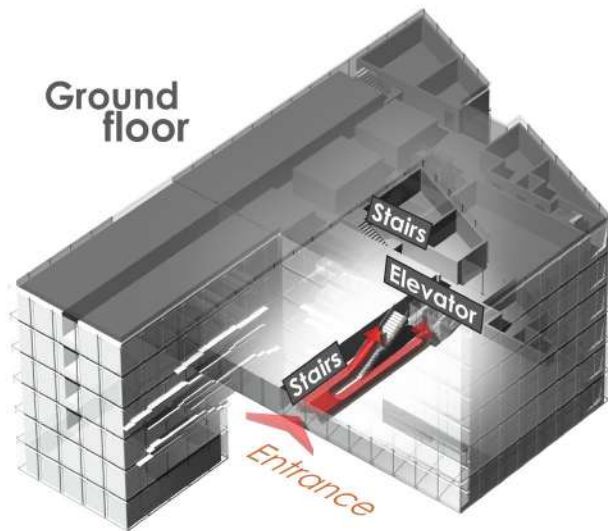




CONFERENCE VENUE







Wednesday, 17 September 2025 - Main Hall

- 9:00 Introduction - Conference Organizers
- 9:10 Welcome address by the Rector of the Warsaw University of Technology
- 9:30 Welcome Address by E-MRS President A.J. Kenyon
- 9:35 Laudation and Presentation of the Jan Czocharlski Award to Prof. Claudia Felser

- 9:50 **Czocharlski Award laureate - Prof. Claudia Felser,**
Max Planck Institute for Chemical Physics of Solids, Germany

Topology and chirality



- 10:35 **Prof. Salvo Coffa,**
Robert Bosch GmbH, Reutlingen - Mobility Electronics Department, Power Semiconductors and Modules
- The role of material science in power electronics**



- 11:20 **Prof. David A. Muller**
School of Applied Physics, Cornell University, USA
- Imaging the Properties of Atoms and Fields down to the Picometer Scale inside Materials and Devices**



- 12:05 **Prof. Horst-Günter Rubahn**
University of Southern Denmark, Denmark
- PCAM - GPB (Gian Paolo Bravio) Award**



MATERIALS FOR ENERGY, SUSTAINABILITY AND EXTREME CONDITIONS

- A** Sustainable energy conversion: from emerging materials to devices
- B** Synergies and challenges for materials in extreme environments
- C** Exploring emerging photo and electrochemical systems for CO₂ conversion to fuels and chemicals (II)
- D** Frontiers in carbon science and technology II

CHARACTERIZATION, SIMULATION AND ARTIFICIAL INTELLIGENCE

- E** Materials discovery, modeling, and characterization for sustainable energy applications
- F** Advanced interoperability in atomistic simulations of materials
- G** Artificial Intelligence to accelerate the development of new advanced materials for energy
- H** Reliable characterisation of functional nanomaterials and of materials for energy storage or conversion
- I** Frontiers of imaging and spectroscopy in transmission electron microscopy

THIN FILM, FLEXIBLE AND COMPOSITE MATERIALS AND THEIR FORMATION TECHNIQUES

- J** Unconventional materials and flexible electronics for sustainable technologies
- K** 3D and additive manufacturing of organic materials and nanocomposites for advanced applications
- L** Progress in understanding fundamental, functional material and health aspects of melanins, polydopamine and related polyindole quinone materials
- M** Next-generation thin films: innovations in PVD and CVD techniques
- N** Synthesis and characterization of functional nanocomposite materials

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

- O** Topological textures in antiferroic and ferroic materials
- P** 2D materials for magnetism and spintronics: from fundamentals to integrated technology
- Q** Group-IV semiconductor materials for nanoelectronics and cryogenic electronics
- R** Ultra-doped semiconductors made by non-equilibrium processing for electronic, photonic and spintronic applications IV
- S** Nanomaterials of the future: advancements in energy and sensing
- T** Smart materials for nanoelectronics - nanophotonics & European Doctorate Network: PCAM (Physics and Chemistry of Advanced Materials) Summer School 2025
- U** Metal oxide nanomaterials for advanced optoelectronics and environmental applications
- V** Integration of advanced materials on silicon: from classical to neuromorphic and quantum applications
- W** Defect-induced effects in low-dimensional and novel materials

GENERAL TIMETABLE

Symposium symbol	Symposium location		Monday September 15 th	Tuesday September 16 th	Wednesday September 17 th	Thursday September 18 st
Symposium A	MINI Building	107	08:50-17:30 (2)	09:00-17:30 (2)	14:00-17:30	09:00-17:30
Symposium B	MINI Building	102	09:00-17:30 (2)	09:00-17:15		
Symposium C	MINI Building	328	14:00-17:30	09:00-17:30 (2)	14:00-17:30	
Symposium D	MINI Building	101		09:00-17:15 (2)	14:00-15:30	
Symposium E	Main Building	208	09:00-17:15 (2)	09:00-17:30 (2)	14:00-17:30	09:00-17:30
Symposium F	Main Building	226	09:00-17:15	09:00-17:15 (2)		
Symposium G	Main Building	206		09:00-17:15 (2)	14:00-17:30	09:00-11:30
Symposium H	Main Building	231	09:00-17:15 (2)	09:00-17:30 (2)	14:00-17:30	
Symposium I	Main Building	213		09:00-18:00 (2)	14:00-18:00	09:00-15:30
Symposium J	Main building	144	08:00-18:00	08:15-17:30 (1)	16400-18:00	08:00-17:15
Symposium K	MINI Building	103		08:30-18:00 (1)	14:00-17:45	
Symposium L	MINI Building	105	09:00-17:15 (1)			
Symposium M	MINI Building	329	11:00-17:30	11:00-17:30 (1)	14:00-17:15	
Symposium N	Main Building	134	09:00-17:30 (1)	09:30-17:30 (1)	14:00-17:30	09:00-17:10
Symposium O	Main Building	308		09:00-17:30	14:00-17:45	09:00-15:30
Symposium P	Main Building	412	11:00-17:30	09:00-17:15 (1)	14:00-17:30	09:00-15:30
Symposium Q	Main Building	327	09:00-17:30 (1)	09:00-17:30	14:00-15:30	09:00-12:30
Symposium R	Main Building	437	11:00-17:30 (1)	09:00-17:15	14:00-16:45	
Symposium S	Main Building	306	08:30-17:30 (1)	08:45-17:30 (1)	14:00-17:30	08:45-16:00
Symposium T	Main Building	219	09:00-17:45 (1)	09:00-18:15 (1)	14:00-18:00	09:30-15:30
Symposium U	Main Building	315	09:00-17:30 (1)	09:00-17:30 (1)	14:00-17:30	09:00-17:30
Symposium V	Main Building	309	09:00-17:30 (1)	09:00-17:30	14:00-17:40	09:00-12:30
Symposium W	Main Building	437a	09:00-17:30 (1)	09:00-17:30	14:00-17:30	09:00-10:15
Poster Session Poster Session 17:30-19:00 but may vary depending on symposium timing	Main Building - 237 (Small Hall) (1) Physics Building - Aula (2)		(1) 17:30-19:00 (2) 17:30-19:00	(1) 17:30-19:00 (2) 17:30-19:00		
Plenary Session	Main Building - Main Hall				09:00-12:30	
Thesis Competition	Main Building	213	17:00-19:00			
Conference reception, Young Researcher & Thesis Competition Awards	Main Building Main Hall				18:00-21:00	
Computer Lab - Main Building 162						
LUNCH - Main Building ground floor - I and area II, III						



Exhibition

15-17 September 2025, 09:00-17:15

Location: Main Hall | Main Building



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The following MDPI journals will be represented at the conference:

- *Crystals*;
- *Microplastics*;
- *Hydrogen*;
- *Coatings*;
- *Energies*;
- *Sci*;
- *Metals*;
- *Batteries*;
- *Construction Materials*;
- *Electronic Materials*.



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THE NANoIC pilot line is a pioneering European initiative, hosted by imec, set to provide a leading-edge beyond 2nm System-on-Chip (SoC) pilot line for advanced logic, memory, and interconnect technologies. The project aims to drive European technology leadership across critical markets such as computing, communication, mobility, energy, and health.

The pilot line is a collaboration between imec, CEA-Leti, Fraunhofer-Gesellschaft, VTT, CSSNT-UPB, and Tyndall Institute and is supported by the Chips Joint Undertaking, through the European Union's Digital Europe (101183266) and Horizon Europe programs (101183277), as well as by the participating states Belgium (Flanders), France, Germany, Finland, Ireland, and Romania. For more details, please visit www.nanoic-project.eu.



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- Hall-effect and electric measurement systems and components
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Symposium A

Sessions: Room 231 | MINI Building

Poster Sessions: Aula | Faculty of Physics

MATERIALS FOR ENERGY, SUSTAINABILITY AND EXTREME CONDITIONS

SUSTAINABLE ENERGY CONVERSION: FROM EMERGING MATERIALS TO DEVICES

Symposium organizers:

Arndt **REMHOF**

– EMPA

Erika Michela **DEMATTEIS**
(Main Organizer)

– University of Turin

Michael **HEERE**

– TU Braunschweig

Paul **JERABEK**

– Helmholtz-Zentrum hereon GmbH

Monday, 15 September 2025

SOLID-STATE IONIC CONDUCTORS – ADVANCED METHODS

A01

08:50	Opening and Welcome ORGANISERS	INT1
09:00	Ultrafast Li-Ion Dynamics in Solid Electrolytes as Resolved by NMR Reaching Cryogenic Temperatures H. Martin R. WILKENING	1882
09:15	Impact and Stability of a Reference Electrode for Lithium-ion Battery Using Synchrotron Operando Technique Xavier MOYNE	1588
09:45	Constructing High-Ionic-Conductivity Composite Electrolytes with Improved Interface Stability by Rapid Laser Processing for All-Solid-State Batteries Yuqing LIU	23
10:00	New in situ / operando Magnetometry cell for the study of redox reactions by magnetic properties in M-ion battery material Maria JAUREGUI	20
10:15	Antiperovskite Protective Coatings for All-Solid-State Batteries Philip HENKEL	48
10:30	Coffee break	

INTERFACIAL REACTIONS AT ANODES

A02

11:00	MAX phase oxidation as a new approach for the design of anode materials for lithium and sodium ion batteries: unveiling the origin of high performance Chiara FERRARA	650
11:30	Investigating the interface evolution between halide solid electrolyte and lithium Pierre LANNELONGUE	97
11:45	High-Entropy Engineering of NASICON Na ₃ V ₂ (PO ₄) ₃ Cathodes for Enhanced High-Voltage Sodium-Ion Battery Performance. Manish Kumar SINGH	884
12:00	Industrial application of sustainable zinc-ion batteries for sensors Fabio Luca BARGARDI	20_298

12:30 Lunch

SOLID-STATE BATTERIES

A03

14:00	Magnesium and calcium electrolytes based on hydroborates for solid state batteries Torben R. JENSEN	184
14:30	Pilot Line Characterization and Process Optimization for Magnesium-Based Battery Prototypes Irshad MOHAMMAD	885
14:45	Effect of DMEIm (C7H13N2+) species as an organic ionic plastic crystal on ionic conductivity and thermal stability of PEO polymer electrolyte Gyungmin HWANG	1031
15:15	“Room-Temperature Hydroborate Solid-State Batteries with High Areal Capacity Under Moderate Stack Pressure Enabled by a Silicon Nanocomposite Electrode Hugo BRAUN	499
15:00	Restraining Thermal Runaway in Rechargeable Batteries via Planting PCMs Asghar ARYANFAR	1462
15:30	Coffee break	

CATHODS IN LI AND POST-LI BATTERIES

A03

16:00	Addressing the complexities of elevated mass loading in single-crystal high-voltage spinel cathodes Sandipan MAITI	408
16:15	Cellular carbon networks from polymers for boosting the NVP cathodes performance in Sodium-ion batteries Vinita AHUJA	1333
16:30	Redefining Electrode Design: Conductive Polymers as PVDF/Carbon black Alternatives at the Positive Electrode of Li-Ion Batteries Ivone Marselina NUGRAHA	247
16:45	On the Feasibility of Pyrochlore-type Iron(III) Hydroxy Fluorides as Cathode Materials in Li_PS_Cl All-Solid-State Batteries Jaka ŠIVAVEC	1548
17:15	High-Temperature Thermal Cleaning of Ultrafast-Sintered Li7La3Zr2O12 Solid-State Electrolytes Kostiantyn KRAVCHYK	1715

17:30 Hybrid TMD-OMIEC Materials for Flexible, Self-Powered Biosensing Platforms
Matteo MASSETTI

1318

POSTER SESSION 1

AP01

- | | | |
|-------|---|--------|
| 17:30 | High Throughput Evaluation of Thickness-Dependent Performance of Organic Photovoltaics Under Dim Indoor Illumination
Muhammad Ahsan SAEED | 01_100 |
| 17:30 | Formation of a stable LiF-rich SEI layer on molybdenum-based MXene electrodes for enhanced lithium metal batteries
Shakir ZAMAN | 02_113 |
| 17:30 | Manipulating Multimetallic Effects: Programming Size-Tailored Metal Aerogels as Self-Standing Electrocatalysts
Qian CUI | 03_134 |
| 17:30 | Biomass waste for the preparation of rGO-like carbon /TiO ₂ composites derived from cassava residue for counter electrodes in dye-sensitized solar cells
Wasan MAIAUGREE | 04_137 |
| 17:30 | An in-depth analysis of charge recombination and photodegradation mechanisms in tert-butyl-modified carbazole self-assembled monolayers for improved organic solar cell performance
Rahmatia Fitri Binti NASRUN | 05_15 |
| 17:30 | Transparent Contacts and Anti-Soiling Coatings Based on SiO ₂ /ITO for Enhancing the Performance of Semi-Transparent Perovskite Solar Cells in Harsh Environments
Mohammad Istiaque HOSSAIN | 06_162 |
| 17:30 | Engineering the Electron Transport and Interconnection Layers for Enhanced Performance in Perovskite/CIGS Tandem Solar Cells
Dae-Kue HWANG | 07_165 |
| 17:30 | Facet-Controlled NaO ₂ Crystal Growth via Microporosity Modulation in Commercial Carbon Air Cathodes for Sodium_Oxygen Batteries
Jhony Xavier FLORES-LASLUISA | 08_166 |
| 17:30 | SDS-Capped ZnO Nanotubes: Synthesis and Effects on Aloe Barbadensis Miller
Anwar SAIYAD | 09_168 |
| 17:30 | Heavily Doped Silicon Thin Film for Lattice Boundary Modulation Toward Thermoelectric Devices
Fu-Hsiang KO | 10_18 |
| 17:30 | Design of Transition Metal Doped Ceria Carbon Composite as Cathode Material for Rechargeable Zinc Air Battery Application
Ajay MOHAN | 11_188 |

17:30	Silica Stabilized Fe-N_ Active Sites in Biomass-Derived Electrocatalysts for High-Performance Zinc-Air Batteries Edwin Osebe NYANGAU	13_214
17:30	Ultrafast Hot Carrier Transfer and Bond Activation in Nitrate Photoreduction on CdSe Quantum Dots: Insights from Ab Initio Quantum Dynamics Ankita KUMARI	14_217
17:30	Boosting Performance of Organic Photodetectors and Perovskite Solar Cells through Interfacial Passivation Chih-Ping CHEN	15_22
17:30	Optimization of Charge Transfer on Fluorinated Polymers towards Efficient Sustainable Energy Harvesters: Triboelectric Nanogenerators Franziska DREHER	16_224
17:30	Green Synthesis of Aloe Vera-Assisted Co ₃ O ₄ Nanostructures: Structural, Electronic, Optical, and Electrochemical Insights for Supercapattery Applications Mohit BHATT	17_235
17:30	Operando Insights into Cu-Substituted P2-Type Layered Oxides for Sustainable High-Voltage Sodium-Ion Batteries Jon SERRANO-SEVILLANO	19_288
17:30	Upcycling of waste glass into porous ceramics for the degradation of organic pollutants from wastewater Maria WAQAR	21_3
17:30	Upcycling of waste glass into porous ceramics for the degradation of organic pollutants from wastewater Maria WAQAR	21_4
17:30	Dielectric Characterization of Charge Transport Limitations in Lithium-ion Battery Electrodes Julius AKINRIBIDO	22_300
17:30	Surpassing the high-voltage limits of NMC materials via advanced manufacturing Eleni FIAMEGKOU	23_302
17:30	Binder-Free SrCoO ₃ -_ Electrode Films for Asymmetric Supercapacitors Optimized via Electrophoretic Deposition Aayush MITTAL	24_307
17:30	Comparative Analysis of Calcination Strategies for NMC ₈₁₁ Synthesized via Oxalic Coprecipitation Antonino GIARRIZZO	25_311

17:30	Hierarchically Structured Electrocatalyst with Fe Single Atoms and Ultrafine Mo ₃ N for Enhanced Activity and Durability in Flexible Zinc–Air Batteries Jinsoo KIM	26_336
17:30	Ballistic Graphene Rectifiers for Efficient Energy Harvesting and Charge Storage Minwook KIM	27_339
17:30	Bridgman Growth, Scintillation and Luminescence Properties of α -Ga ₂ O ₃ and Zn _{1-x} BexSe Single Crystals Abdellah BACHIRI	28_345
17:30	Development of a Sustainable All-in-One Flexible Zinc-Ion Battery Alazne OJANGUREN GUMUCIO	29_360
17:30	Optimisation of the molten-salts synthesis of monolithic NMC811 Benjamin BORGNE	30_415
17:30	High-Throughput Synthesis of Air-Sensitive Halide Solid Electrolytes for Next-Generation Batteries Parisa VAHDATKHAH	31_439
17:30	A Highly Robust and Conducting Ultramicroporous 3D Fe(II)-based Metal-Organic Framework for Efficient Overall Energy Storage Soumen KHAN	32_445
17:30	Biodegradable TEMPO-functionalized Polycaprolactone for Sustainable Electrochemical Energy Storage Applications Sangho CHO	33_46
17:30	Sustainable Synthesis of Na ⁺ and Bi ³⁺ -doped Cs ₂ AgInCl ₄ Double Perovskites for Efficient White-Light Emission Shweta CHAHAL	34_467
17:30	Ruthenium(II) Benzoquinonediimine Complexes as Additives for Enhanced Stability and Light Harvesting in Organic Photovoltaics Jan Alexander RETHMEIER	35_49
17:30	Engineering Next-Gen VOH Cathodes for Zinc-Ion Batteries: A Synergistic Synchrotron and DFT Exploration Sanna GULL	36_498
17:30	Synergistic Engineering of Se Vacancy and Heterojunction in NiSe ₂ /FeSe Electrode for Enhanced Ion Transport in High-Performance Flexible Hybrid Supercapacitor and Overall Water Splitting Daya RANI	37_50

17:30	Rational Electrode Design for Balanced and Enhanced Ionic and Electronic Conduction in High-Loading All-Solid-State Batteries Yunho LEE	38_538
17:30	Influence of Internal Temperature Stabilisation on EIS-based SOH diagnostics of EV Battery Modules for their Second-Life Use Martin KEMENY	39_570
17:30	In-situ Presodiation of Sodium-deficient Prussian Blue Analogue for Practical Applications in Na-ion Batteries Leonardo SBRASCINI	40_577
17:30	Multipurpose thermal composite for thermal energy storage, photothermal conversion and barocaloric thermal management Carmen DE CABO-RODRÍGUEZ	41_584
17:30	Impedance analysis of lithium-ion batteries by using electrochemical impedance spectroscopy Hae Kyung JEONG	42_603
17:30	A Study on Vehicle Anomaly Detection Techniques Based on Detailed Features and SOC Segmentation Using Real-World Electric Vehicle Monitoring Data Woojoong KIM	43_622
17:30	Optimizing MoS ₂ -based composite electrodes for high-performance supercapacitors via substrate surface engineering and hydrothermal synthesis Peter ONDREJKA	44_628
17:30	Synthesis, Crystal Structure and Optoelectronic properties of n-butyldimethylsulfonium lead triiodide John KOUTSOUBOGERAS	45_637
17:30	Growth and properties of RuddlesdenPopper perovskite thin films for hot polaron photovoltaics Christopher HAUSMANN	46_645
17:30	Illumination dependent hot polaron photovoltaics in strongly correlated perovskite manganites Annika DEHNING	47_660
17:30	Stability of tricyanomono fluoroborate IL electrolytes at porous carbon electrodes David MÜLLER	48_667
17:30	High-Performance Biocompatible Moisture-Enabled Nanogenerators using Gelatin-SnS ₂ Composite for Sustainable Energy Harvesting Subhamay PRAMANIK	49_76
17:30	Thermally Evaporated All-Inorganic Perovskites for Pure-Red Light Emitting Diodes Shaoni KAR	50_82

17:30
Designing P- and N-Type Polymeric Ionic Gels via Side-Chain Engineering for Sustainable Nonaqueous Thermoelectrics
51_142

Hyunjung LEE

Tuesday, 16 September 2025

COMPUTATIONAL INSIGHTS IN ENERGY MATERIALS
 A05

09:00
Multiscale modeling of transport and degradation phenomena in all solid-state batteries
45

Liwen WAN

09:30
Reinforcement Learning Framework for Optimizing Leaching Recovery from End-of-Life LIBs
1168

Irem TOPSAKAL

08:45
Stabilizing Thin Li Metal Anodes via Salt-Coated Separators: An Operando-Computational Approach to Interface Engineering
1041

Eunbin JANG

10:00
Computational design of triboelectric materials for energy harvesting, sensing, and safety
765

Giulio FATTI

10:15
Machine Learning-Based Prediction of Cathode Catalyst Layer Degradation using EIS and CV
1380

Ines Edima ATANGANA MEYANGA

10:30
Coffee break

MATERIALS FOR HYDROGEN STORAGE AND GENERATION
 A06

11:00
Energy storage in C based materials from agrifood wastes: preparation and physico-chemical characterization
154

Chiara MILANESE

11:30
Toward Sustainable Hydrogen Generation: Photoreforming of Plastic Waste over Pt Single-Atom Anchored g-C₃N₄
545

Yin-Hsuan CHANG

11:45
Scaling-up photoelectrochemical hydrogen production: integrating materials and devices
490

George H. CREASEY

12:00	Investigation of the effects of cations on Polymer Electrolyte Membrane (PEM) water electrolysis for hydrogen production Ren HIGUCHI	376
12:15	Novel Manufacturing of Fe-Free Freestanding SWCNT Networks As Ultra-Low Platinum Catalyst Supports For Hydrogen Production Polina KALACHIKOVA	787
12:30	Lunch	

MATERIALS FOR HYDROGEN STORAGE AND GENERATION A07

14:00	IEA Hydrogen TCP Task 51 "Hydrogen Materials for Energy Storage" Martin DORNHEIM	1777
14:30	First experimental characterization of Ammonia alane for solid-state hydrogen storage Maxence VINCENT	462
14:45	Engineered 2D Graphene and MXene-Based Nanostructures for High-Performance Hydrogen Storage Shankar GHOTIA	1066
15:00	Metal Hydride-Based Hydrogen Storage Alloy for Marine buoy Applications Ankita BISHNOI	1149
15:15	Metal hydride hydrogen storage for automotive application - A new approach to overcome the challenge of the cold start scenario Maximilian PASSING	1385
15:30	Coffee break	

HYDROGEN PRODUCTION: TOWARDS APPLICATIONS A08

16:00	Unveiling the Synergistic Effect of Co(OH) ₂ -CdIn ₂ S ₄ Nanoheterostructures for Enhanced Electrochemical Water Oxidation Maria METAXA	573
16:15	Corona-Boosted Piezocatalysis: Transforming Ferroelectric Materials for Enhanced water splitting Abinaya KRISHNAMURTHY	1204

16:30	Probing the Electrochemical Activity of the 114 Cobaltite Structures for the Oxygen Evolution Reaction Abhishek BHARTI	902
16:45	RIE-Treated Cu ₂ O/SnO ₂ Heterojunction Photocathode for Efficient Hydrogen Evolution Muhammad WAQAS	926
17:00	Harnessing the Synergistic Effect of Mo-Doping in NiSe for Enhanced HER Performance in Alkaline Media , ROHMA	995
17:15	Nanoengineered Nickel Nitride-V ₂ CTX Mxene as Bifunctional Electrocatalyst for Alkaline Water/Seawater Applications Deepak DEEPAK	1117

POSTER SESSION 2 AP02

17:30	Stable SEI Layer Formation through Targeted Decomposition of Concentrated Lithium Salt in Polymer Matrix for High-Performance Lithium-Ion Batteries Jiwon KIM	01_1008
17:30	Fractal arrays of silicon nanowires for photonics Maria Jos_ LO FARO	02_1014
17:30	Design of a fluorinated polyelectrolyte network for enhancing Li ⁺ mobility and interface of electrode-electrolyte in lithium metal batteries Changseop KIM	03_1034
17:30	Sustainable Recovery of Black Powder from Spent LIBs through Optimized Green Solvent Methods Hyunseok LEE	04_1064
17:30	Optimization for Enhanced Cycle Life of Lithium Secondary Battery Modules Hyung-Geun LIM	05_1069
17:30	Water-in-salt hydrogel electrolyte for dendrite-free Zn deposition Varsha Joseph ARIYAMPARAMBIL	06_1081
17:30	Enhancement of Li-Ion Conductivity in Oxide Solid Electrolytes via LiClO ₄ Addition and Pressure-Assisted Sintering Jeong Woo JANG	07_1096

17:30	Multiphysics Framework for Evaluating Plasmonic Schottky Solar Cells with Integrated Thermal Dynamics Brahim AISSA	08_1130
17:30	Interface engineering for minimizing trapped charge density in α -Ga ₂ O ₃ Schottky barrier diodes for high-performance power devices Shivani SHIVANI	09_1285
17:30	Sol-gel and Solvothermal Synthesis of Mesoporous TiO ₂ with Controlled Particle Size and Crystalline Phase for Noble Metal Catalyst Supports Jeong Seo LEE	10_1294
17:30	Aluminium as efficient hole-collecting electrode for active layers in inverted architecture photovoltaic devices Aleksandra TOMASZOWSKA	12_1403
17:30	Flexible Piezo-/Pyroelectric Polycrystalline Lysozyme Assemblies Krittish ROY	14_1488
17:30	Work Function Uniformization at Li/LLZO Interfaces Using a Li-Alloying Interlayer to Mitigate Space-Charge Effects in All-Solid-State Batteries Jeewon LEE	15_1500
17:30	Graphoepitaxial Gate-all-around Si Circuitry Patterned Nanowire Arrays: A Block Copolymer Assisted Hard Mask Approach Tandra GHOSHAL	16_1522
17:30	Current Collector Selection for Water-processed Electrochemical Capacitor Electrodes Paulo Filipe LUÍS	17_1531
17:30	Aqueous Biphasic Redox Flow Batteries on Microscale Vikram SINGH	18_1560
17:30	Understanding the Activity–Durability Trade-Off in Iridium Oxide Catalysts through Controlled Phase Evolution Control Byung Guk KANG	19_1565
17:30	Morphology-Directed Synthesis of Mesoporous LaNiO ₃ Nanocubes for High-Performance Oxygen Evolution Catalysis Hyeok MUN	20_1566
17:30	(Photo)Electrochemical Deposition of Silicon from Ionic Liquids Maximilian DIECKE	21_1579

17:30	Synergistic Effect of Precursor, Cation and Interface Engineering unlocks the pathway for high efficiencies in FAPbI ₃ Perovskite Solar Cells Sylvester Sahayaraj MASILAMANI LEO	22_1584
17:30	Co-Ni Tungstate/Graphene Nanoplatelets Composite Electrodes for High-Performance Supercapacitor Shuang LIU	23_1605
17:30	Synergistic Effects of Au Nanoparticles on the Phase Transformation and Pyroelectric Performance of PVDF Nanofibers Sudip NASKAR	24_1685
17:30	Long-Life Ni-Rich Layered Cathode for Lithium-Ion Batteries by Microstructural Refinement and Surface Modification Hoon-Hee RYU	25_1693
17:30	Electrosynthesis of molecular memory elements Pradeep SACHAN	26_1734
17:30	Fabrication of flexible nanogenerator using hollow sphered bismuth ferrite nanoparticles for efficient energy harvesting Shashank Bhushan DAS	27_1743
17:30	Laser-Processed Porous Carbon Zn Anode Surface Modification Layer for Aqueous Zn-Ion Batteries Recep YUKSEL	28_1785
17:30	Optimizing NiTiO _x Powders for Supercapacitors: Coprecipitation vs. Solid-State Synthesis in Sustainable Energy Conversion Pegah BAVAFA	29_1800
17:30	Bioresorbable/Bioeliminable and Wireless Rechargeable Na-ion Battery for Temporary Implantable Medical Devices Vedikuyilazhagan MUNIRAJ	30_1814
17:30	Stabilizing Multi-Electron Redox in NASICON Cathodes: Fe and Mo Doping for High-Energy and Long-Life Sodium-Ion Batteries Sheetal GUPTA	31_1873
17:30	Mechanically Robust and Chemically Stable Halloysite-Integrated Core-Shell Composite Separator via Coaxial Electrospinning for High-Performance Sodium-Ion Batteries Akash KANKANE	32_1884
17:30	Betaine: Glycerol based hybrid deep eutectic electrolyte coupled with Brewery waste derived carbon for eco-friendly Zinc ion capacitors Kiran Kumar Reddy REDDYGUNTA	33_680

17:30	Chemical and structural characterisation of Ni- and Cu substituted TiVCrMn-based alloys for high temperature hydrogen compression Erika Michela DEMATTEIS	34_708
17:30	Toward Sustainable and Intelligent SAW Gas Sensors: Simulation-Guided Design and Machine Learning-Assisted Butterworth–Van Dyke Modeling Suman ACHARYA	35_711
17:30	Modulating buried interface through fluorinated ligands in p-i-n semi-transparent perovskite solar cells Bhavna SHARMA	36_736
17:30	Optimized Charging Profile and Diagnostic Method for Faulty Cell Detection in Lithium-Ion Batteries Yu DONGGEUN	37_746
17:30	Revisiting the electrochemical activity of alpha-V2O5 electrode for aqueous ammonium ion batteries Jesus SANTOS PENA	38_766
17:30	Design and Modelling of CsSnBr3/Ga2O3 hybrid photodetectors by SCAPS-1D: optimized parameters for high UV selectivity and bifacial usage Tarak HIDOURI	39_806
17:30	Composite polymer electrolyte harnessing Li2CO3 with Ethylene vinyl acetate (EVA) polymer based on Garnet-type Li7La3Zr2O12 for semi-solid-state batteries Youngmin MOON	40_813
17:30	Synergistic effects of Li7La3Zr2O12 solid electrolyte and Aligned Electrospun Polyacrylonitrile Nanofibers for Mechanically Robust and thermally stable Membranes Heesu KIM	41_816
17:30	Electrodeposited MnNiZnOx as a Bi-Functional Catalyst for Metal-Air Battery Applications Iklime KAYHAN	42_826
17:30	Dual-anion ionic liquid electrolytes: a strategy for achieving high stability and conductivity in lithium metal batteries Jemin LEE	43_828
17:30	Fluorine-Segment-Incorporated Copolymer Electrolyte for Enhanced Electrochemical Stability in High-Voltage Lithium Metal Batteries Asif JAVID	44_830
17:30	Monolithic Integration of Novel Quasi Solid State LIBs and solar driven systems enhanced Low Temperature and High C rate Performance applied in Electrical Vehicles . Hsuan-Kai TSENG	45_831

17:30	Unlocking Controlled-Leakage Current Conduction in BiFeO ₃ Thin Films via Mn-Induced Structural, Optical and Electronic Modulation Nilofar NAAZ	46_853
17:30	Exploring the Maximum Barium Substitution at the Perovskite B-Site: Structural and Photovoltaic Implications in Hybrid Halide Perovskite Solar Cells Yin-Hsuan CHANG	48_938
17:30	UV-Polymerized Composite Solid Electrolyte Incorporating 3D LLZO Nanofiber Network for Solid-State Batteries Wu-Young GOH	49_950
17:30	Advanced Ionovoltaic Energy Generation via Flow – Regulating Interlayer Seungyeon YU	50_969
17:30	Pd-Loaded Layered Double Hydroxides as Efficient Catalysts for CO ₂ Hydrogenation to Formic Acid: A Focus on Surface Hydroxyls Pooja NEHRA	51_978
17:30	Surface Morphology Enhancement of Nanomembranes Fabricated via Deep Reactive Ion Etching for Silicon-Based μ -SOFCs Byeong-Jin JANG	52_981
17:30	End-of-Life Crystalline Silicon Solar Cell Recycling Strategy to Mitigate Carbon Footprints Krishan Kumar PATEL	53_996
17:30	1 nm LiF Island-Type Thin Film Enables Dendrite-Free Li Nanorod Formation in Anode-Free Lithium Batteries Jiwoo KIM	54_814

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

HYDROGEN STORAGE: TOWARDS APPLICATIONS A09

14:00	Tuning the composition of (TiVNb)-Cr/Mo high entropy alloys for optimum hydrogen sorption Claudia ZLOTEA	192
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14:30	Improving the Hydrogen Sorption Kinetics of Amide-Hydrides System with the Incorporation of Mesoporous Carbon (CMK3) Mohsin ABBAS	808
14:45	Geometric optimization by FEM simulations of a coupled high temperature hydride-based hydrogen storage and a thermochemical energy storage system André MARTINS NEVES	1302
15:00	Large-scale coating methods to improve the performance of metal alloys for hydrogen storage Jan WARFSMANN	839
15:15	Carbon Nitride/NiO/Zn ₃ N ₂ Nanocomposites for Electrochemical Applications in Supercapacitors and Water Splitting Tanuja SINGH	493
15:30	Coffee break	

HYDROGEN USE: TOWARDS APPLICATIONS

A10

16:00	Perspectives on the design of multicomponent alloys for hydrogen storage Sabrina SARTORI	1145
16:30	Numerical Investigation of Coolant Channel Geometry Effects on PEM Fuel Cell Performance Abdelhakim MERDJANI	1449
16:45	The restoration of PEM cell performance by trivalent weak acid Taiga GOTO	377
17:00	Intrinsic proton relay in poly-phosphamide to bolster proton-exchange membrane fabrication and electrocatalytic proton reduction Anup MAHATA	758
17:15	N ₂ Photocatalytic fixation through Bi ₂ O ₃ - based materials Loredana LATTERINI	1434
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

SOLID STATE HYDROGEN STORAGE

A11

09:00	Spontaneous reactions of titanium alloys with hydrogen at room temperature Marek POLANSKI	1883
09:30	Sustainable Synthesis of TiFe-Based Alloys for Hydrogen Storage: Influence of Synthesis Method and Manganese Substitution Nicol Daniela JARAMILLO RODRIGUEZ	297
09:45	Mechanochemical reduction of New Zealand resources to TiFe for hydrogen storage Nigel LUCAS	769
10:00	Investigation of Hydrogen Diffusion in TiFe and the Effects of Mn and V Doping: A Combined Theoretical and Experimental Approach Samia RACHIDI	254
10:15	Optimising MgH ₂ -based Slurries for Efficient Hydrogen Storage and Generation Magdalena SAAGER	646
10:30	Coffee break	

HYDROGEN TECHNOLOGIES SUPPORTING ENERGY VALUE CHAIN

A12

11:00	From Hazard to Harvest: Making AB ₂ Metal Hydrides Recyclable through Controlled Deactivation Mateusz BALCERZAK	441
11:30	Structural and electrochemical characterisation of Sm/Gd co-doped ceria electrolytes for IT-SOFCs Mantas SRIUBAS	896
11:45	Pore Structure Engineering via Hard-Template Synthesis: Unlocking High Oxygen Reduction Reaction Activity and Stability of Fe-N@C Electrocatalysts Giulia GIANOLA	364
12:00	Data-Driven Impedance Analysis Framework for Embedded Real-Time Fault Detection in PEMFCs Sunil KUMAR	1295

12:15	Thermogalvanice Cells Towards Large-scale Heat-to-Electricity conversion Dan ZHAO	250
12:30	Lunch	

MATERIALS FOR SOLAR CELLS

A13

14:00	Additive and interface engineering to passivate bulk and surface defects in triple cation perovskite solar cells Parameswar IYER	181
14:15	Advancing Tin Halide Perovskite Solar Cells via Dual-Coordination Additive and Buried Interface Modification Strategies Ziqi LIANG	1630
14:30	Rational Design and Visualization of Multifunctional Phenothiazine-Based Self-Assembled Monolayers for Better Interface Contact in High-Efficiency and Stable Perovskite Solar Cells Qurrotun Ayuni Khoirun NISA	16
15:00	Lithium photo-extraction at solid/solid interface for solar energy conversion and storage Masataka YOSHIMOTO	982
15:15	Enhancing charge extraction in organic solar cells using controlled doping Mathias NYMAN	1163
15:30	Coffee break	

MATERIALS FOR ENERGY HARVESTING

A14

16:00	Transparent Photovoltaics, Photodetectors and Artificial Synapses Kim JOONDONG	974
16:15	Porous-Material-Enhanced Triboelectric Nanogenerator (TENG) Integrated with IoT for Advanced Energy Harvesting Shahzad IQBAL	554
16:30	Linking Electron Cloud Potential Wells to Achieve Ultrahigh Output Current in a Triboelectric Nanogenerator Hai-Dong YU	797

16:45	Facile synthesis of CuO nanoparticles-PEDOT:PSS-based inks for low-cost, flexible thermoelectric energy harvesting Ajay KUMAR	21
17:00	PDMS Nanocomposites With Sio2@Ag For Tuneable Optical, Thermal, Wetting Properties for triboelectric nanogenerator. Ashish KUMAR	323
17:15	Advancing Multifunctional Energy Harvesting with One-Dimensional Tellurium Nanocomposites: A New Paradigm in Flexible Electronics Utsa SARKAR	835



Symposium B

Sessions: Room 102 | MINI Building
Poster Sessions: Aula | Physics Building

MATERIALS FOR ENERGY, SUSTAINABILITY AND EXTREME CONDITIONS

SYNERGIES AND CHALLENGES FOR MATERIALS IN EXTREME ENVIRONMENTS

Symposium organizers:

Fabien **ONIMUS**
Fredric **GRANBERG**
Luca **REALI**
(Main Organizer)

- CEA, Université Paris-Saclay
- University of Helsinki
- UK Atomic Energy Authority

Monday, 15 September 2025

		SESSION 1	B01
09:20	Development of a Highly Corrosion-Resistant Coating Utilizing the Synergistic Effect of Ni/Zn-Ni Multilayer Structures in a Single Zn-Ni Electrolyte Bath Sohee YUN		949
09:40	Advancing Corrosion Protection in LFRs: Characterization of HiPIMS-Deposited Metallic Coatings Laura SANNA		1074
10:00	Towards stronger high-entropy alloy by heterogeneous structure of nanoprecipitation-hardened ultrafine-grains at cryogenic temperature Mengmeng ZHAO		121
10:30	Coffee break		

		SESSION 2	B02
11:00	Short range order analysis for a comprehensive description of complex processes in medium and high entropy alloys: NiCoCr and CoCuFeNiPd Axel POISVERT		358
11:20	Self-Healing in Photovoltaic Materials: Chemical Insights from Antimony Chalcogenides and Chalcogenides Eran EDRI		1278
11:40	The influence of photoelectron spectroscopy in ultrahigh vacuum on the photoluminescence lifetime of thin-film solar cell absorber materials Philine STÖTZNER		1243
12:00	Investigation of Degradation Pathways in CZTSSe Solar Cells under Harsh Environmental Conditions Mohammad Istiaque HOSSAIN		164
12:30	Lunch		

		SESSION 3	B03
14:00	Radiation effects in REBCO in the fusion environment Daniele TORSELLO		128

14:30	Ultrafine Transparent MgAl ₂ O ₃ Spinel Ceramics for ITER Fusion Reactor Windows Ameni HAWEL	309
14:50	Radiation response of Ceramic Composites for Advanced Nuclear Applications Rishvana PARVEEN	1347
15:10	Defects induced by high-temperature neutron irradiation in 250 μ m thick 4H-SiC p-n junction detector Annamaria MUOIO	1726
15:30	Coffee break	

SESSION 4

B04

16:00	Sampling Complex Energy Landscapes in Material Science Using Data-Driven Force Fields Mihai-Cosmin MARINICA	1093
16:30	Modelling of Radiation Defects in Fe-Cr-He Alloys Using Machine-Learning Interatomic Potentials Jan WRÓBEL	859
16:50	Defects and Impurity Properties of VN precipitates in ARAFM Steels: Modelling using a Universal Machine Learning Potential and Experimental Validation Ryan STROUD	285
17:10	Comparison of simulated and experimental defect distributions of irradiated materials using computer vision. James HEATH	1613

POSTER SESSION 1

BP01

17:30	Dual-Zwitterionic Locking Strategy for High-Performance Nanofiltration: Boosting Salt and Heavy Metal Removal Arshyn ZHENGIS	01_1143
17:30	Research Progress and Development Trend of Laser Hybrid Surface Modification Jianhua YAO	03_1183
17:30	Microstructure Regulation Research of Hardened Layer via Laser Hybrid Solid-State Phase Transformation Qunli ZHANG	04_1203

17:30	Solute-Dislocation Interactions in Zr Alloys Modeled with Universal Machine Learning Interatomic Potentials Colleen REYNOLDS	05_1220
17:30	Modelling the Interaction Between Creep and Irradiation in Steels Abdus SHAIK	06_1287
17:30	Towards enhanced environmental compatibility: chemical profile of functionalized Ti6Al7Nb alloy Lucyna GRZADZIEL	07_1524
17:30	Flexible Photonic Cooler Based on Multi-Stacked Thin Film IR Filters with Anti-Dust Properties for Photovoltaic Applications in Desert Environments Mohammad Istiaque HOSSAIN	08_163
17:30	Investigating the properties of PEEK carbon fibre composites made via the HiPerDiF method Ragnar BIRGISSON	09_1722
17:30	Nonlinear theory of impurity diffusion in porous talc after ultrasonic treatment: prospects for the development of lithium batteries Olesya DAN'KIV	10_351
17:30	Modeling Phase Behavior in Chromium based Medium Entropy Alloys via DFT-CALPHAD and Experiments for high temperature applications Abdulaziz ALHAZAA	11_471
17:30	Characterization of Fusion and Filler-Assisted Laser Beam Welding of 6061-T6 Aluminum Alloy Dong Jun PARK	13_547
17:30	Application of boron containing flame retardant dye for different surfaces Elif ÖZTOK	14_551
17:30	Study on removal mechanism of TC4 oxide film by nanosecond pulsed laser cleaning in air environment Liang WANG	15_559
17:30	Development of a High-Performance Al-8Si-0.22Mg-0.7Cu Alloy for Structural Die Castings Youngok YOON	16_614
17:30	In Situ Raman Insights into the Durability of NiFe ₂ O ₄ under Intermittent Power Operation in Alkaline Water Electrolysis Chang-Hee KIM	17_960

Tuesday, 16 September 2025

		SESSION 5	B05
09:00	Atomic-scale simulations to understand corrosion and solute-defect behaviour in Zr alloys Mark WENMAN		1401
09:30	In Situ Temperature Gradient Ion Irradiation of Novel Nuclear Steel: A Single-Sample Approach to Studying Temperature-Dependent Damage Mechanisms Jim JOHNSON		1742
09:50	Point Defect Origins of Dislocations in Zr ₂ Cu Under Irradiation from First Principles Colleen REYNOLDS		1223
10:10	Cluster dynamics simulations of solute precipitation and defect formation in alloys under irradiation using log-time stochastic algorithms Rohit VASAV		103
10:30	Coffee break		

		SESSION 6	B06
11:00	Defect stabilisation in tungsten during simultaneous deuterium loading and displacement damage creation Sabina MARKELJ		1441
11:30	Radiation-Induced Ion Tracks and Electronic Structure Changes in Zr-Doped Ceria (Ce _{0.8} Zr _{0.2} O ₂) under 100 MeV SHI Exposure Vivek KUMAR		1782
11:50	Effect of temperature on track creation in GaN under Swift Heavy Ion irradiation Louise GOODWIN		1445
12:10	Neutron Irradiation Experiments and Characterization of New Boron Carbide Control Rod Absorber Materials X K LIU		851
12:30	Lunch		

SESSION 7
 B07

14:00	Understanding irradiation induced IPyC cracking and IPyC-SiC debonding in TRISO using peridynamics Keyi PEI	1651
14:20	Dosimetric platform and a genuine Raman protocol for passive estimation of fast-neutron fluence in irradiated SiC and SiC topped with epitaxial graphene Jakub JAGIELLO	1048
14:40	Zr-based Bulk Metallic Glass for Extreme Conditions: Thermophysical Properties and Processing Pathways Damien TEREBENEC	459
15:00	Development of SiC-Based CMUTs for Harsh Environments: A Material Challenge Quentin DAVID	1367
15:30	Coffee break	

SESSION 8
 B08

16:00	From Miscibility to Unexpected Separation: In-Situ TEM Insights into Au–Pd Alloy Behaviour at High Temperatures Abhijit ROY	1199
16:20	Sintering-Driven Optimization of Sm/Ta-Doped Bi_Ti_O__ Ceramics for High-Temperature Piezoelectric Devices Dr. Srishti PALIWAL	126
16:40	Phase dynamics and magnetic properties of Mg incorporated Ex-Situ MgB2 superconductor modified with B4C and Dy2O3 Soo Kien CHEN	483
17:00	Behavior of Refractory Materials Under Hydrogen Atmospheres for the Direct Reduction of Iron Ore. Mouna HELLO	135

Wednesday, 17 September 2025

9:00	PLENARY SESSION
12:30	Lunch

18:00 YOUNG RESEARCHER AWARDS CEREMONY

18:30 SOCIAL EVENT



Symposium Sponsors

Symposium C

Sessions: Room 328 | MINI Building

Poster Sessions: Aula | Faculty of Physics

MATERIALS FOR ENERGY, SUSTAINABILITY AND EXTREME CONDITIONS

EXPLORING EMERGING PHOTO AND ELECTROCHEMICAL SYSTEMS FOR CO₂ CONVERSION TO FUELS AND CHEMICALS (II)

Symposium organizers:

Konstantinos **GKAGKAS**

Adriano **SACCO**
(Main Organizer)

Chrystelle **SALAMEH**

Talat **RAHMAN**

- Toyota Motor Europe NV/SA
- Italian Institute of Technology
- Center for Sustainable Future Technologies
- University of Montpellier
- University of Central Florida

Monday, 15 September 2025

NOVEL ELECTROCATALYSTS AND STRUCTURES FOR CO₂ CONVERSION (I)

C03

14:00	Colloidal nanocrystals for structure-activity relationships, reconstruction and stability in the CO ₂ reduction reaction Jari LEEMANS	229
14:30	Cu-based bimetallic catalysts for Enhanced CO ₂ Electroreduction toward C ₂ + products Lan HUANG	531
14:45	Hybrid N-Containing Polymer Coated Cu ₂ O Nanoparticles Tune the Selectivity of the Carbon Dioxide Reduction Reaction towards C ₂ + Products Tobias SCHWARZ	1226
15:00	TiO ₂ /Cu heterojunction catalysts for CO ₂ electrocatalytic reduction Laura VIGNI	845
15:30	Molecularly tailored nanohybrids for efficient electrocatalytic CO ₂ reduction Federico FRANCO	1711
15:45	Coffee break	

COMPUTER-AIDED SIMULATIONS FOR CO₂ ELECTROREDUCTION

C04

16:00	Toward a Realistic Modeling of CO ₂ Electroreduction: From Grand Canonical Barriers to Machine-Learned Interface Behavior Giancarlo CICERO	405
16:30	Identifying Optimal Cu Alloys for CO Dimerization during CO ₂ Reduction: Insights from Constant Potential DFT Wei WANG	272
16:45	Single Atom Catalysts on Boron doped Graphene for CO ₂ reduction to CH ₄ : Impact of Varied Boron Concentration Sudatta GIRI	1147
17:00	From Surface Configurations to Binding: Determining the Effective Cutoff Radius for CO Adsorption on CuAl Alloys Alejandro CANETE ARCHÉ	847

17:15	Simulations of electrochemical reactions in the presence of aqueous electrolyte using a hybrid approach combining DFT and polarizable potential function Magnus CHRISTIANSEN	844
17:30	Understanding ion-specific interactions in anion-exchange membranes via atomistic modeling Paige BRIMLEY	1179

Tuesday, 16 September 2025

TECHNOLOGIES FOR CO₂ CAPTURE AND CONVERSION

C05

09:00	Electrochemical Direct Air Capture Using Homogeneous and Heterogeneous Redox-Active Heterocyclic Quinones Maryam ABDINEJAD	51
09:30	Electrochemical Capture of CO ₂ through Active Redox Carriers in pH-swing Electrolyzer Daniele SASSONE	663
09:45	Impact of carbonaceous materials on metal-based composites for CO ₂ capture and electroconversion Mirtha A. O. LOURENCO	1334
10:30	Coffee break	

SINGLE-ATOM AND MOLECULAR ELECTROCATALYSTS

C06

11:00	Molecular (photo)electrochemical catalytic reduction of CO ₂ . From all C ₁ products to complex molecules Marc ROBERT	475
11:30	Enhancing CO ₂ Electroreduction to Methanol: Addressing Gas Diffusion Electrode Hydrophobicity and CO ₂ Mass Transfer Medhanie Gebremedhin GEBRU	575
11:45	Single-atom doped copper electrocatalysts for electrochemical CO ₂ reduction to C ₂ + products Lifeng LIU	735
12:00	Molecular catalysts embedded in semiconductors engineering for efficient catalytic CO ₂ reduction Laura CALVILLO	1036
12:30	Lunch	

NOVEL ELECTROCATALYSTS AND STRUCTURES FOR CO₂ CONVERSION (II)

C07

14:00	Nano-confinement boosts CO ₂ to multicarbon products by stabilizing the catalyst electronic structure Ivan GRIGIONI	1234
14:30	Cu-Sn Alloy Catalysts for Efficient and Selective Electrochemical CO ₂ -to-Formate Conversion Chrysanthi GKILI	613
14:45	Atomic Layer Deposition Strategies for the Fabrication of Electrodes for CO ₂ Reduction Lovelle Rhoy MANPATILAN	1255
15:00	Online/Operando Insights Into Cu-Al Bimetallic Catalysts For Efficient CO ₂ Electroreduction Toward Liquid Products Huali WU	1314
15:30	Electrochemical reduction of CO ₂ and CO to oxygenates at high reaction rates Omran MORADLOU	1456
15:45	Coffee break	

ADVANCED CHARACTERIZATION AND MODELING OF INTERFACE PHENOMENA

C08

16:00	Exploring Mesoscopic Mass Transport Effects on Electrocatalytic Selectivity Hemanth S. PILLAI	479
16:30	Tracking Catalyst Evolution in CO ₂ RR: A Combined Operando Raman and TEM Study Abdul WAHAB	906
16:45	Exploring the role of the local environment in electrode-membrane assemblies for the electroconversion of CO ₂ Ma_Ile PAYA	1155
17:00	Operando X-ray Absorption Spectroscopy of Cu-based Catalysts in a Custom MEA Cell for CO ₂ Electroreduction Alessia BARDAZZI	1259
17:15	Operando characterizations of catalysts for CO ₂ reduction Angelica CHIODONI	1756

POSTER SESSION 2
CP02

17:30	High-throughput computational evaluation of MOFs for CO ₂ capture from flue gas and ambient air Brahim AISSA	01_1124
17:30	Leveraging Machine Learning to predict CO ₂ uptake in Metal-Organic Frameworks: A Data-Driven Approach Brahim AISSA	02_1129
17:30	Cu-based catalysts with enhanced selectivity for CO ₂ electroreduction by morphological engineering Lan HUANG	03_1327
17:30	Electrochemical CO ₂ Reduction on BiSn Eutectic Mixture: Shifting from Formate to Formic Acid Production Avni Nandkishor GURUJI	04_1370
17:30	Understanding the role of the catalyst in electrochemical CO ₂ reduction to solid carbon on liquid metals Miriam ÜBELE	05_1556
17:30	Bridging Physics and Artificial Intelligence: Force Fields for Carbon Dioxide from Classical to Machine Learning Ignazio VACANTE	06_1787
17:30	Production of Novel DAPP-Based Membranes for CO ₂ Electrolysis Carmelo PARATA	07_223
17:30	Elaboration of MxCu _{100-x} NPs / p-Si photocathodes and modelling of their photocarrier collection properties for the photoelectrochemical CO ₂ reduction Sylvain LE GALL	08_304
17:30	Preparation of Au–Zn alloy thin films using electrochemical methods Eidai MORI	09_386
17:30	Electronic Structure Modulation of Nickel Single-Atom Catalysts for Enhanced Electrochemical CO ₂ Reduction in Acidic Environment Mengstu Etay ASHEBIR	10_44
17:30	Enhanced Ethanol Production via Photo-Thermal CO ₂ Hydrogenation over Fe-Modified Co Catalysts Sameera SHAFI	11_494

17:30	Designing High Efficiency CO ₂ Reduction Photocatalysts—Insights from a Photo-Assisted Kelvin Probe Force Microscopy Study Ming-Chung WU	12_542
17:30	Cu Oxides based catalysts for CO ₂ electrochemical reduction Laura VIGNI	13_641
17:30	A Deeper Understanding of Flooding Dynamics in GDEs for CO ₂ electrolyzer: the Role of Interfacial Pressure Control for the Gas-Liquid Interface stability Daniele SASSONE	14_665
17:30	Laser-Ablated BiOCl/CoFe Prussian Blue Heterojunction for Photocatalytic Water Oxidation and Scavenger-Free CO ₂ Conversion to CO and CH ₄ Sara SAMUEI	15_684
17:30	Ligand Field Engineering Enables Low-Overpotential and High-Rate CO ₂ Electroreduction on Ni-N-C SACs Osama NASR	16_903

Wednesday, 17 September 2025

09:00 **PLENARY SESSION**

12:30 Lunch

SCALABILITY AND ENGINEERING CHALLENGES TOWARD INDUSTRIAL DEPLOYMENT

C09

14:00	Upscaling CO ₂ electroreduction: engineering challenges and opportunities Esther SANTOS	266
14:30	Electrochemical CO ₂ Reduction to Formate Using GDEs and Its Integration with Fermentation for the Production of Fatty Acids Adriana RIOJA CABANILLAS	268
14:45	Influence of antimony doping on tin oxide nanoparticles for high current density electrochemical reduction of CO ₂ to formate Digvijay GHOGARE	373
15:00	Design and testing of a Three-Compartment Electrolyzer for CO ₂ Electroreduction to Formic Acid Camilo PERALTA	881

15:15	Advancing Bismuth-Based Gas Diffusion Electrodes for CO ₂ Reduction to Formate: Towards Self-Repairing Gas Diffusion Electrodes Eran EDRI	1275
15:30	Coffee break	

SCALABILITY AND ENGINEERING CHALLENGES TOWARD INDUSTRIAL DEPLOYMENT **C10**

16:00	Unraveling Complex Reaction Networks via accelerated Kinetic Monte Carlo: Dry Reforming on Pt/HfC Catalysts Hector PRATS	118
16:30	Computational investigation of the FeRh alloy structures and the mechanism and selectivity of CO ₂ hydrogenation Shijia SUN	715
16:45	Stabilizing Metal Coated Silicon Photocathodes for Light Assisted CO ₂ Conversion by Area Selective-Atomic Layer Deposition Encarnacion TORRALBA	719
17:00	Inverse design of bifunctional active sites for catalytic CO ₂ reduction Shubhajit DAS	1335
17:15	Advancing urea quantification at trace levels: overcoming analytical challenges through method optimization and IC-MS Viktoria GOLOVANOVA	1358
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	



Symposium Sponsors



Symposium D

Sessions: Room 101 | MINI Building
Poster Sessions: Aula | Faculty of Physics

MATERIALS FOR ENERGY, SUSTAINABILITY AND EXTREME CONDITIONS

FRONTIERS IN CARBON SCIENCE AND TECHNOLOGY II

Symposium organizers:

- | | | |
|---------------------------|---|------------------------------|
| Hyacinthe RANDRIAMAHAZAKA | – | Université Paris Cité - CNRS |
| Nianjun YANG | – | Hasselt University |
| (Main Organizer) | | |
| Paula COLAVITA | – | Trinity College Dublin |
| Quan-Hong YANG | – | Tianjin University, China |

Tuesday, 16 September 2025

SYNTHESIS AND FUNCTIONALIZATION

D05

09:00	Controlling impurity doping in CVD grown (111) diamond layer for quantum technologies Hiromitsu KATO	789
09:30	Tailoring Single-Walled Carbon Nanotubes: From Polymer Synthesis and Chirality-Oriented Separation to Covalent Functionalization Andrzej DZIENIA	1376
09:45	Functionalization of highly porous, reduced graphene oxide paper via cold atmospheric pressure dielectric barrier discharge linear jet. František ZELENÁK	1113
10:00	MXene-Based Catalysts for Environmental Degradation of Chlorinated Hydrocarbons: A DFT Perspective Miroslav KOLOS	1373
10:15	CVD-MOF synthesis of nanoporous ZIF-8-derived carbon electrodes for microsupercapacitors Jeng-Yu LIN	1274
10:30	Coffee break	

APPLICATION I

D06

11:00	Engineering the sp ₂ -sp ₃ Carbon Puzzles: Microporous Three-Dimensional Boron-Doped Diamond Nanoarchitectures as Multifunctional Electrochemical Platforms for Next-Generation Energy Storage Robert BOGDANOWICZ	310
11:30	2D materials and its composite for energy storage Jinhua SUN	1559
11:45	Performance improvement of “moisture-enabled electric generating paper” based on carbon-nanotube-composite paper by impregnation with sodium dodecyl sulfate solution Hiyu MITSUMAKI	967
12:00	Turning Olive Waste into High-Performance Hard Carbon Anodes for Sodium-Ion Supercapacitors: From Synthesis Challenges to a High-Current-Density Competitive Device Manuel PINZON	1065

12:15

Sustainable hydrogen storage: activated carbon from agri-food waste

Chiara MILANESE

349

12:30

Lunch

		PROPERTIES	D07
14:00	Bandgap engineering of nanodiamonds: towards photoreactivity under visible light Jean-Charles ARNAULT		63
14:30	Enhanced photoluminescence of single walled carbon nanotubes due to carbyne encapsulation Dido DENIER VAN DER GON		1298
14:45	Crossing the blood brain barrier and other biological barriers by carbon quantum dots Sabine SZUNERITS		27
15:00	Immersion infrared reflection-absorption spectroscopy studies on diamond-like carbon surfaces. III. Post-growth modifications of a-C Vitaly RAEV		1550
15:30	Coffee break		

		APPLICATION II	D08
16:00	An Electrochemical Study on the Impact of Nitrogen Incorporation in Carbon Nanowalls on their Catalytic Activity Angelina PASTÖTTER		1170
16:15	Sodium Carboxymethylcellulose-Carbon Nanotube Hybrid Composite: A Sustainable Approach to Humidity Detection Dorota BIERNACKA		1429
16:30	Enhanced Long-term Anthracene Detection and Degradation on Nanocrystalline boron-doped Diamond Electrodes Yao LI		1603
16:45	Improvement of power generation efficiency of transpiration-type thermoelectric power generating paper based on carbon-nanotube-composite paper by controlling its liquid absorption ability Kazuhide YAKATA		965
17:00	INickel-Modified Laser-Induced Graphene based Wearable Microsupercapacitors for Temperature Monitoring ABHISHEK PANGHAL		

POSTER SESSION 2 DP02

- | | | |
|-------|---|---------|
| 17:30 | Laser Induced Graphene nano-anchored WS ₂ /WO ₃ heterostructures for electrocatalytic oxygen evolution reaction and seawater splitting
Tanuja SINGH | 01_1116 |
| 17:30 | Nickel-Modified Laser-Induced Graphene based Wearable Microsupercapacitors for Temperature Monitoring
Abhishek PANGHAL | 02_1120 |
| 17:30 | Modification of photoluminescent emission from single-walled carbon nanotubes through aryl peroxides chemistry
Patrycja TABOROWSKA | 03_1123 |
| 17:30 | Effect of different surface terminations on MXene's reactivity for water dissociation: A DFT study
Talha KALSOOM | 04_1218 |
| 17:30 | o-Aminophenol-functionalized Ti ₃ C ₂ T ₂ coupled with laser-induced graphene for micro-droplet detection of fenbendazole
Mei LIU | 05_1612 |
| 17:30 | Highly sensitive electrochemical sensor based on laser carbonization of Cu-COF
Can WU | 06_1614 |
| 17:30 | Diamond-Graphene Nanohybrid Composite Films_ Preparation, Characterization and Application
Wen ZHANG | 07_1646 |
| 17:30 | Fabrication of Fe/Ni-NC/PC Composite and Highly Sensitive Electrochemical Sensor for Carbendazim Detection
Liudi JI | 08_1718 |
| 17:30 | A Highly Sensitive Electrochemical Sensor for Ciprofloxacin based on In Situ Coupling of Cu-BTC with Brick Tea-Derived Porous Carbon
Liudi JI | 09_1720 |
| 17:30 | Voltage-electrolyte tailored graphene electrodes for nM-level dual detection of Ponceau 4R and Rhodamine B in food products
Kangbing WU | 10_1725 |
| 17:30 | Simultaneous On-Site Detection of Zearalenone and Methyl Parathion Using a Cu-Ni Bimetallic Aerogel/Graphene Sensor
Xiaoyu LI | 11_1730 |

17:30	Phase Engineering of Nanomaterials (PEN): 2D Nanomaterials Hua ZHANG	12_1760
17:30	Impact of carbon nanodot uptake on complex impedance charge transport and energy storage mechanism in aloe vera leaves Kajal GAUTAM	13_236
17:30	Innovative CVD Activation for High-Performance Mesoporous Carbon in Zinc-Ion Hybrid Capacitors Guoli ZHANG	14_359
17:30	Laser-induced graphene coated wearable smart textile electrodes for biopotentials signal monitoring Vidhya C M	15_661
17:30	Synthesis of Excitation-Tunable Carbon Quantum Dots for Ratiometric Sensing and Cancer Bioimaging. Jithin VARGHESE	16_733
17:30	Synthetic Approaches for Stable Polymeric Carbon Nitride Panels for Photoelectrochemical Water-Splitting and Flow/Batch Photochemical Reactions Michael VOLOKH	17_809

Wednesday, 17 September 2025

09:00 **PLENARY SESSION**

12:30 Lunch

		APPLICATION III	D09
14:00	Hybrid Seawater Electrolysis for Hydrogen Production Lifeng LIU		14
14:30	N-doped Carbons - from Electrochemical Hydrogen Storage to Electrocatalytic Hydrogenation Reactions Mateusz ODZIOMEK		866
14:45	Binder-free integration of Ti3C2 MXene on graphene nanowalls-coated carbon felt for hydrogen evolution catalysis Roger AMADE		153

15:00	Investigating interfacial interaction between graphene and flowing water for energy conversion Takeru OKADA	127
15:15	Experimental and Theoretical (DFT/TDDFT) Studies of Carbon Quantum Dots for Optoelectronic Applications Shruti SHARMA	616
15:30	Coffee break	

APPLICATION IV		D10
16:30	Improving Conversion Efficiency of Paper-Based Dye-Sensitized Solar Cells by Extra Dye Impregnation Chihiro SHIMIZU	744
16:45	Donor-acceptor 2D covalent organic frameworks as cathode material for aluminum energy storage device Cataldo VALENTINI	1256
17:00	Bio-Sourced Modified Laser-Induced Graphene with Quasi-Solid Electrolyte for Flexible Supercapacitors in Wearable Devices Van BUI-THI-TUYET	1240
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	



Symposium E

Sessions: Room 208 | Main Building
Poster Session: Aula | Faculty of Physics

CHARACTERIZATION, SIMULATION AND ARTIFICIAL INTELLIGENCE

MATERIALS DISCOVERY, MODELING, AND CHARACTERIZATION FOR SUSTAINABLE ENERGY APPLICATIONS

Symposium organizers:

Biplab **SANYAL**

Graziella **MALANDRINO**

Jost **ADAM**
(Main Organizer)

Poulumi **DEY**

- Uppsala University
- Università degli Studi di Catania
- University of Kassel
- TU Delft

Monday, 15 September 2025

MATERIALS FOR HYDROGEN PRODUCTION AND EVOLUTION

E01

09:00	Phase stability of La-Ni-Sn-H materials intended for hydrogen storage Martin FRIÁK	474
09:30	Scalable Continuous-Flow Synthesis of PtNiRu@Graphene Nanoalloys for Enhanced HER Performance in Acidic Media Srinivas KATAM	294
10:00	Tailoring Electronic Properties of W _{1-x} Nb _x S ₂ ternary alloy nanosheets by composition tuning: to enhance Hydrogen Evolution Reaction Manoj PALABATHUNI	480
10:15	Strain Modulated Catalytic Activity of Pt ₂ XSe ₃ (X = Hg, Zn) in Hydrogen Evolution Reactions Caique DE OLIVEIRA	1404
10:30	Coffee break	

MATERIALS FOR HYDROGEN PRODUCTION AND EVOLUTION

E02

11:00	Structure and phonon dynamics of Cu/Ag-based thermoelectric materials by combining first-principles and neutron scattering Bao-Tian WANG	389
11:30	V ₂ Se ₂ O and Janus V ₂ SeTeO: Monolayer altermagnets for thermoelectric applications Shubham Rakesh SINGH	101
11:45	Outstanding Thermoelectric Properties of Functionalized 2D MXenes (ZT ~ 5) Jan KOLODZIEJCZYK	1300
12:00	Effect of atomic structure and molecular templates on thin film thermoelectric performance. Samuel JARVIS	1762

12:15	Exploring Different Routes to Unlock the Potential of High Entropy Alloys for Electrocatalytic Water Splitting Ugur UNAL	1436
12:30	Modelling-Guided Fabrication of Robust Patterned Transparent FTO Substrates for Scalable Photovoltaic and Photoelectrochemical Energy Systems Dzmitry IVANOU	1452
12:30	Lunch	

MATERIALS FOR SUSTAINABLE ENERGY I

E03

14:00	DFT calculation and chemical bonding analysis for sustainable metallic materials Yixu WANG	402
14:30	A computational exploration of photocatalytic hydrogen and oxygen evolution reaction pathways in low-dimensional Ni/MoS_ systems Aku LEMPELTO	1411
14:45	Activity Enhancement in Al-Cu-Fe-Ni-Ti High Entropy Alloy for Hydrogen Evolution Reactions Pedro AUTRETO	1423
15:00	Green Hydrogen Objective: Chemical Functionalization of GaN Nanowires for the Development of Innovative Photocatalysts Hiba EL IDRISSE BOUYAHYAOU	515
15:15	Electrochemical performance of spinel CuFe2O4 obtained from End-of-Life lithium-ion batteries Ayat ELSHAZLY	177
15:30	Coffee break	

MATERIALS FOR SUSTAINABLE ENERGY II

E04

16:00	Combining theory, experiment and AI in materials design: new opportunities for sustainable world Igor ABRIKOSOV	834
16:30	First principles study of oxidation resistance of amorphous Si-(B)-C-N materials, and experimental verification Jemal Yimer DAMTE	356

16:45	Novel heterobimetallic compounds for fluoride-based materials and their applications Claudia BARBAGALLO	916
17:00	Persistent Luminescence: an innovative tool for radiative cooling Roberto BONDI	1374
17:15	Advanced characterization of copper thin film deformation under simultaneous applied stress and ion beam irradiation Fabien ONIMUS	528

POSTER SESSION 1 EP01

17:30	Development of highly filled flame retardant composites with an organic matrix for application in buildings Sol_ne DE MÉZERAC	01_10
17:30	Data-Driven Forecasting of Microstructure Evolution in Carbon and Low alloy Steel Atul SRIVASTAVA	02_1028
17:30	Raman spectra deconvolution of NMC materials for compositional and state-of-charge diagnostics Dominika BUCHBERGER	03_1139
17:30	High cycle fatigue behavior of low carbon micro-alloyed dual phase steel sheets for sustainable and affordable car body structures Gaurav PANDEY	04_138
17:30	LTO solid electrolytes for alkaline metallic batteries. Electronic and mechanical properties modified by atomic substitutions José Alejandro LEÓN CANCINO	05_157
17:30	Long-Term Degradation Mechanisms in Perovskite Solar Cells: A Three-Year Study Mohammad Istiaque HOSSAIN	06_161
17:30	Deep eutectic solvent utilizing potassium iodide and propylene glycol as redox electrolyte for hybrid electrochemical capacitors – characterization and optimization. Aleksandra MROZIEWICZ	07_199
17:30	Electrochemical fabrication of copper sulfate microneedles for needle sensors Ryoma OKADA	08_244
17:30	O content and room-temperature aging effects on deformation modes in metastable _ titanium alloy Xin HUANG	09_306

17:30	Construction of MoS ₂ Nanosheets/Hydrogenated Graphene Hybrid Catalysts for Highly Efficient Electrocatalytic Hydrogen Evolution Xiuxiu HAN	10_330
17:30	Development of SOH Diagnostic Model Based on Partial Charging Data for Electric Vehicles Sang Jun PARK	11_338
17:30	MoxTiyCx+y_1 Double-Transition Metals MXenes as electrodes of supercapacitors: A DFT study Hamidreza JOUYPAZADEH	12_344
17:30	Study of the influence of alkali metals on the atomic structure of Cu(In,Ga)Se ₂ using Raman spectroscopy Eryk LICHOCKI	13_357
17:30	Electrochemically formed Single-Atom Centers of MXenes for the Selective Electrochemical Reduction of Nitrogen to Ammonia Diwakar SINGH	14_36
17:30	Formation of Cu– ZnO catalyst with composite structure of Cu dendrite crystals and ZnO thin-film plates Takuma YAMADA	15_387
17:30	Innovative Solution-Based Approach for Synthesis of Polycrystalline LiNbO ₃ Thin Films Using a novel bimetallic Li– Nb complex Francesca LO PRESTI	16_424
17:30	Numerical analysis of plasmonic particles formed by direct laser writing Taavi REPÄN	17_426
17:30	First principles study of oxidation resistance of amorphous Si-(B)-C-N materials, and experimental verification Jemal Yimer DAMTE	18_428
17:30	In-situ Polymerized Fluorinated Solid Polymer Electrolytes Enabled by High-Energy Electron Beam Irradiation for Lithium Batteries Wookil CHAE	19_446
17:30	Ultrafast Photo Carrier Dynamics in CeO ₂ Revealed by Time-Resolved X-ray Absorption Spectroscopy Sang Han PARK	20_449
17:30	Oxygen Evolution Reaction on Twisted Layered Double Hydroxides Peter BECK	21_457

17:30	A Simulation-Based Framework for Electropolishing PBF-Fabricated Inconel 625 in energy applications Hyunbin JO	22_466
17:30	Machine Learning models enable the prediction of PVDF Nanogenerator performance optimization Md Mehedi Hasan APU	23_509
17:30	Bandgap Engineering of Pbl_(1-x) Br_(x) Prepared by Room Temperature Chemical Solution Hamad ALBRITHEN	24_533
17:30	Stabilization of the Cubic β -Phase of SnS with Calcium Impurities Susmita PAUL	25_549
17:30	Modelling stress corrosion cracking resistance at high deformation Jason LEE	26_581
17:30	Engineered Ni-P Coated Graphite Catalysts for Sustainable γ -Valerolactone Production via Photothermocatalysis Pol VILARI_O	27_597
17:30	Electrodeposited Multimetallic Electrocatalysts for the Selective Aqueous Electroconversion of Biomass-Derived Levulinic Acid into Value-Added Molecular Platforms Pol VILARI_O	28_598
17:30	Advanced Electroless Plated Metal Foams for Enhanced Thermal Management with Liquid Metals Yook DONGGYU	29_632
17:30	Electrochemical Evaluation of Wet-Spun Ti_C_T_ MXene Fibers for High-Performance Supercapacitors Aleyna AKILLI	30_64
17:30	Strain-dependent modulation of metal/WS2 Schottky nanocontacts Andrea GERBI	31_644
17:30	Ceramic fiber composites based on recycled materials for thermal insulation applications Krzysztof KOGUT	32_675
17:30	AFM Characterization of the Mechanical Properties of Hydrogels: Calibration and Evaluation of Young's Modulus on the Nanoscale Helena VALENTOVÁ	33_689
17:30	Biocompatible Energy Harvesting Devices for Low frequency operation Sunny SHARMA	34_788

17:30	Predicting Formability in Halide Perovskites through Accelerated ML Screening Soheila ABBASIMOFRAD	35_803
17:30	Modeling performance and stability enhancement in R-NN1/MnO2 by substitution of Co and Ni Anurag JHA	36_821
17:30	MOCVD-grown Calcium Ferrite thin films as photocatalysts for water remediation Laura SALAMONE	37_857
17:30	Voltage-Induced Degradation in Nickel-rich NMC Electrodes: In-Situ XRD and Raman Study Pawel STEPNIICKI	38_878

Tuesday, 16 September 2025

MULTI-SCALE MODELING I

E05

08:45	First-principles phase field method of microstructures in high-temperature alloys Ryoji SAHARA	541
09:15	Polaronic effects induced topological phase transitions in quantum (spin) Hall flat band insulators Saurabh BASU	1587
09:45	Plasma Facing Materials, Multiscale modeling of Damage evolution Giorgio LO PRESTI	1383
10:00	Multi-scale characterization of carbon-based polymer fibers and composites using Small and Wide-Angle X-Ray Tensor Tomography Carolina GUTIÉRREZ BOLANOS	712
10:15	Cobalt Diffusion in SrTiO3 Thin Films: A Multi-Scale Characterization Approach Qian MA	1339
10:30	Coffee break	

DATA-DRIVEN MATERIAL DESIGN

E06

11:00	Calculation data-driven design and optimization of coatings for Ti bipolar plates in PEM water electrolyser environment Chaofang DONG	216
11:30	Data-Driven Discovery of Thin-Film Phospho-Sulphides Semiconductors Using Combinatorial Synthesis and FAIR Principles Eugene BERTIN	1154
11:45	Data-driven discovery of metal-organic framework catalysts for small molecule conversions Shubhajit DAS	1312
12:00	Computational approach to fast analysis of Electrochemical Impedance Spectroscopy Cristiano LO PO	601
12:15	Fast-Tracking Solar Cell Materials Discovery Using Automation, Physics Modeling and Bayesian Machine Learning Joseph CHAKAR	1027
12:30	Teaching oxidation states to neural networks Cristiano MALICA	872
12:45	Lunch	

MACHINE-LEARNING-BASED METHODS

E07

14:00	From electronic structure to polycrystals via machine learning: Lithium transport in argyrodite solid electrolytes Blazej GRABOWSKI	666
14:30	Practical Investigations of Machine-Learning-Based Molecular Dynamics Using Quantum Thermal Bath for Nuclear Quantum Effects in Perovskite Oxides Kansei KANAYAMA	341
14:45	Following reaction kinetics in multiphase systems using local descriptors from machine-learned interatomic potentials Agnieszka WARNICKA	690

- | | | |
|-------|---|-----|
| 15:15 | High-throughput and data-driven search for stable optoelectronic AMSe_ materials
Nikhil SINGH | 182 |
| 15:30 | Coffee break | |

MULTI-SCALE MODELING II	E08
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- | | | |
|-------|--|------|
| 16:00 | Hydrogen embrittlement mechanisms revealed by atomic- and micro-scale simulations
Francesco MARESCA | 1617 |
| 16:30 | Response of Halide Perovskites to Mechanical Stress using Molecular Dynamics Simulations
Pranjul Chandra BHATT | 751 |
| 16:45 | Disorder, Dynamics, and Transport in Naphthalene-Diimide Mixed Ionic-Electronic Conductors
Marco SEVERI | 119 |
| 17:00 | Phase-field and crystal plasticity study of microstructure influence on corrosion damage
Maciej MAKUCH | 284 |
| 17:15 | Normal Dynamics: solving Newton's equations of motion in the reciprocal space
Antonio CAMMARATA | 583 |

POSTER SESSION 2	EP02
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- | | | |
|-------|--|---------|
| 17:30 | Determination of defects properties in semiconductor through temperature dependent of Photoluminescence techniques : comparison between modulated and time resolved regime
Sylvain LE GALL | 01_1107 |
| 17:30 | Influence of Bi__ Heterovalent Doping on Negative Capacitance and Ionic Conductivity in MAPbBr_ Single Crystals: Prospects for Neuromorphic Applications
Farha Naaz MANSOORIE | 02_1125 |
| 17:30 | Niobium and Tantalum Addition to Ti/V-Based High Entropy Alloys for Hydrogen Storage
Jose Antonio VILLAJOS COLLADO | 03_1148 |

17:30	Optimizing Supercapacitor Design: A Diffuse-Interface Computational Framework for Enhanced Electrochemical Performance via Morphology Engineering Parul PARUL	04_1228
17:30	Compatibility of compositions in core-shell NMC cathodes for lithium-ion batteries Michal GRYGIEL	05_1245
17:30	Core-Shell NMC cathodes for High-Performance Lithium-Ion Batteries - The Role of Calcination Temperature, Atmosphere, and Process Pathways Natalia FIRLEJ	06_1297
17:30	Data-Driven Analysis of Structure-Property Relationships in Crack-Defined Nanomesh Networks Jo NAMHUN	07_1299
17:30	Strain path dependent microstructure and texture evolution in α -Titanium during ambient temperature Multi-Axial Forging Sujit NAYAK	08_1317
17:30	Efficient Bandgap Modeling of Double Perovskite Oxides Using Deep Neural Networks Soheila ABBASIMOFRAD	09_1391
17:30	Deep Learning-Driven Optimization of Eco-Friendly CIGS Solar Cells: Synergistic Effects of Plasmonic Light Trapping and Bandgap Engineering Faycal DJEFFAL	10_1412
17:30	From NMC to NMC: Recycling of NMC622 Cathode Materials Magdalena WINKOWSKA-STRUZIK	11_1424
17:30	DFT investigation of the Photocatalytic Performance of Monoclinic Bismuth Vanadate (BiVO ₄) Through Synergistic Surface Facet and Intrinsic Defect Engineering Shaikhah LARADHI	12_1466
17:30	Asymmetric Perylene Bisimides at the Bay Positions: Charge Transfer and Photostability studies Chenbo MENG	13_1468
17:30	First-Principles Investigation of Nitrogen Doping and Stacking-Dependent Electronic Structure Modulation in Imine-Based 2D Covalent Organic Frameworks Diksha SRIVASTAVA	15_1504

17:30	Design and simulation of lead free Perovskite Solar Cell Bharti KAUSHAL	16_1520
17:30	Hydrogen Production through Zr-Based MOFs Synthesized from PET-Derived Terephthalic Acid Alessia DI GRAZIA	17_1530
17:30	Enhanced Ionic Conductivity and Structural Insights in Zr-Doped LiTa ₂ PO ₈ Ceramics Konrad KWATEK	18_1540
17:30	Linking Ionic Conductivity, Microstructure and Sintering Temperature in Ti-doped LiTa ₂ PO ₈ Ceramics Klaudia PACHULSKA	19_1541
17:30	Investigation of chemical species in Uranium-containing Deep Eutectic Solvent (DES) and preparation of UO ₂ fuel microspheres Yan ZHANG	20_1564
17:30	Discerning the duality of H in Mg: H-induced damage and ductility Yucheng JI	21_1572
17:30	Oxygen adsorption behavior of various BCC Iron surfaces: A Density Functional Theory study Poulumi DEY	22_1583
17:30	Synthesis and characterization of AgBiS ₂ thin films prepared by magnetron sputtering followed by sulfurization Marius FRANCKEVICIUS	23_1596
17:30	In-situ XANES Analysis of Redox Properties in CeO ₂ -Al ₂ O ₃ for Enhanced Oxygen Storage Property in Ni Catalysts Krongthong KAMONSUANGKASEM	24_1635
17:30	In-plane thermal conductivity measurements in nanoscale materials based on two laser Raman thermometry Timm SWOBODA	25_1636
17:30	Optimizing Polymer Electrolytes Using POSS Nanoparticles and Machine Learning: A Pathway to Superior Li-ion Battery Performance Anji Reddy POLU	26_1661
17:30	Effect of surface modification in form of coating on structural and electrochemical properties of lithium iron phosphate Jakub MRÓWCZYNSKI	27_1697
17:30	Flexible CIGS BIPV Modules: A Sustainable Solution for Modular Construction Joao MAGALHES	28_1705

17:30	Eco-Friendly Microwave Synthesis of Dy-Doped Sodium Zinc Molybdate for Superior Luminescence and Photocatalysis Sourabh GOURAHA	29_1723
17:30	Deformation mechanism in copper columnar nanotwin structure under tensile loading : Insights from the molecular dynamics simulation Nitin Kishore RAWAT	30_1727
17:30	Revealing rich magnetic phases and novel spin-wave spectra in Orthorhombic perovskite TbCrO ₃ : a first principles study Fengyi ZHOU	31_1761
17:30	Innovative concepts applied in obtaining new anode materials for Li – ion batteries Ioana-Cristina BADEA	32_1803
17:30	High-Performance Supercapacitor Based on Borophene/V ₂ CT ₂ MXene 2D Hybrid Electrodes Berfin Gülay GÜLER	33_1827
17:30	Designing Organic Redox active Polymer as Cathodes for High-Performance Zinc-Ion Batteries Anita SAMAGE	34_1835
17:30	Enhanced Performance of Graphene-Based Supercapacitor Electrodes via Stepwise Electrophoretic Deposition Haniyeh ZAFARKISH	35_1843
17:30	The Momentum Microscope at the Beamline P22 as Tool for Materials Characterization. Volkmar KOLLER	36_1846
17:30	From nanoparticle individuality to ensemble behaviour, the road to protein corona Anna FUCIKOVA	37_768
17:30	Highly Stable Lead-Free Tin Perovskite Nanocrystals Through Structural Engineering Sunardi RAHMAN	39_886
17:30	Crystal Structure Prediction in p-Type π -Conjugated Organic Semiconductors Based on Machine Learning and Molecular Simulations Takuya SEKI	40_984

Wednesday, 17 September 2025

09:00

PLENARY SESSION

12:30

Lunch

BATTERY MATERIALS

E09

- 14:00

Computational Design of Na-ion Battery Cathodes via a Machine Learning–DFT Pipeline
Tanmoy PAUL

964
- 14:30

Data-driven Lithium Salt Design for Long-Cycle Lithium Metal Battery
Kyungju NAM

280
- 14:45

New methodology for the mechanical characterization of interfaces in all-solid-state lithium batteries
Daphné MOLÉ

514
- 15:00

Selectivity aspects in critical metal recycling from spent Li-ion batteries
Jedrzej PIATEK

1523
- 15:30

Coffee break

PHOTOVOLTAIC AND PEROVSKITE MATERIALS

E10

- 16:00

Computational X-ray Spectroscopy for Organic Photovoltaics
Iulia Emilia BRUMBOIU

867
- 16:30

Tuning spin polarized lifetime in two-dimensional perovskites
Xihan CHEN

99
- 16:45

Combining Component Screening, Machine Learning and Molecular Engineering for the Design of High-Performance Inverted Perovskite Solar Cells
Thierry PAUPORTÉ

527
- 17:00

Spectral Modulation of Lead-free Cs₂NaInCl₆ Double Perovskites via Sb³⁺/Mn²⁺ Co-doping and Bromide Ion Substitution for Multifunctional Applications
Anjana YADAV

92

17:15	Enhanced Water Stability of Halide Perovskites via Graphene Flake Encapsulation: Insights from CsPbI ₃ and Beyond Oussama ER-RIYAH	1562
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

		2D MATERIALS I	E11
08:30	Two-dimensional Based Raindrop Triboelectric Nanogenerators Foad GHASEMI		1549
09:00	Broadband non-linear response in noble metal dichalcogenides Paul SEIFERT		1537
09:30	From MAX to MXene: Decoding the etching protocols behind 2D MXene formation Mehya MANSOOR		1368
09:45	Janus monolayers of Ge ₂ SeTe for harvesting green energy and sustainable technologies: A Computational Approach Mohaddeseh Mehmandoust Khajeh DAD		1382
10:00	First principles study of photocatalytic activity in ZnO-Janus van der Waals heterostructures Tahir WAHAB		526
10:15	Construction of MoS ₂ Nanosheets/Hydrogenated Graphene Hybrid Catalysts for Highly Efficient Electrocatalytic Hydrogen Evolution Xiuxiu HAN		329
10:30	Coffee break		

2D MATERIALS II

E12

11:00	Emergence of polar skyrmions in 2D Janus CrInX ₃ (X=Se, Te) magnets Duo WANG	1289
11:30	Nanostructure-Dependent Vibrational Properties of Phosphorene Nanoribbons: An ARPES and First-Principles Study Jacek JASINSKI	114
11:45	First-Principles Insights into Halide-Terminated MXenes for Stabilizing Halide Perovskites Tamar GOLDZAK	1473
12:00	Optimal Substrates for Single-Layer Boron Phosphide from First-Principles Calculations Walter ZUCCOLIN	1118
12:15	From single bond to line defects: a case study from a novel two-dimensional network-forming material Marco DIRINDIN	1310
12:30	Lunch	

COMPLEX QUANTUM MATERIALS

E13

14:30	Orbital-order as the driving mechanism for superconductivity in ruthenates Julien VARIGNON	796
14:45	Theoretical Study of Phonon Anharmonicity in Two-Dimensional MoS ₂ /hBN and WS ₂ /hBN Heterostructures: Impact of Rotational Invariance Violation Konrad WILCZYNSKI	1372
15:00	Charge Manipulation in Hematite Fe ₂ O ₃ as a Route to Polaron Physics Sreehari SREEKUMAR	231

15:15	Optical and excitonic properties in 2D materials and their van der Waals heterostructures using hybrid TD-DFT František KARLICKÝ	1474
15:30	Coffee break	

MATERIALS WITH COMPLEX INTERACTIONS

E14

16:00	Inversion and time-reversal asymmetry-enabled energy-saving spintronic applications Nirmal GANGULI	1357
16:30	Ultrafast Hot Carrier Transfer and Bond Activation in Nitrate Photoreduction on CdSe Quantum Dots: Insights from Ab Initio Quantum Dynamics Ankita KUMARI	722
16:45	Understanding the Atomic-Scale Origins of Interface States in Crystalline and Amorphous Al ₂ O ₃ /GaN Interfaces Marouane AMMAR	915
17:00	On approaches to predicting shear-coupled grain boundary migration in materials Andrej OSTAPOVEC	1667



Symposium F

Sessions: Room 226 | Main Building
Poster Sessions: Aula | Faculty of Physics

CHARACTERIZATION, SIMULATION AND ARTIFICIAL INTELLIGENCE

ADVANCED INTEROPERABILITY IN ATOMISTIC SIMULATIONS OF MATERIALS

Symposium organizers:

Antonio **CAMMARATA**
(Main Organizer)

Miguel **PRUNEDA**

Roberta **POLONI**

- Czech Technical University in Prague
- CSIC-CINN, and CSIC-ICN2
- CNRS, UGA SIMaP

Monday, 15 September 2025

SESSION 1

F01

09:15	New functionalities of the AiiDA infrastructure Xing WANG	1262
09:45	PerQueue: A Dynamical, Graph-Based Workflow Manager Peter BECK	431
10:00	Atomistic insights into the intermolecular interactions governing glycerol removal from biodiesel using deep eutectic solvents Mirat KARIBAYEV	1532
10:15	Accelerating Density Functional Theory Relaxations Through the Synergistic Integration of AI/ML Force Fields: A Comprehensive Study Utilizing CHGNet and MACE Arsalan AKHTAR	732
10:30	Coffee break	

SESSION 2

F02

11:00	Computational materials engineering with active learning Milica TODOROVIC	1757
11:30	Machine Learning Interatomic Potentials for Structural Modeling of Large Carbon-Based Materials Ignazio VACANTE	1783
11:45	Unraveling Temperature-Induced Vacancy Clustering in Tungsten: Atomistic Insights via Data-Driven Bayesian Sampling Anruo ZHONG	488
12:00	Density functional Bogoliubov-de Gennes theory for superconductors in SIESTA Zeila ZANOLLI	1459
12:30	Lunch	

SESSION 3

F03

14:00	Effects of oxygen adsorption on resistivity in ruthenium thin films Takahisa TANAKA	1710
14:15	Transport properties of carbon nanotube structures in ultrahigh magnetic field Teresa KULKA	1284
14:30	Computation of Magnetic Parameters: TB2J's Extended Implementation of the Magnetic Force Theorem Xu HE	924
15:00	Evolution of Spin Waves with Coherent Phonon Excitation in Magnetic Oxides S S JAYAKRISHNAN	1046
15:15	Efficient atomistic modelling of finite-temperature effects in magnetic metal alloys Léo HALLÉGOT	1025
10:30	Coffee break	

SESSION 4

F04

16:00	Nonlinear optical effects from first-principles: a real-time approach Myrta GRÜNING	914
16:30	Van der Waals heterostructures of PtSSe/WXY (X, Y = S, Se, Te): Ab initio study on photovoltaic and photocatalytic applications Shivprasad Shivaram SHASTRI	706
16:45	Effects Induced by Anion Ordering in Perovskite Oxynitrides: a Many Body Study Sudha Priyanga GANESAPANDIAN	588
17:00	Engineering defect clustering in diamond-based materials for technological applications via quantum mechanical descriptors Matúš KAINZ	852

Tuesday, 16 September 2025

SESSION 5

F05

- | | | |
|-------|---|------|
| 09:30 | Phonon calculations, related properties and materials discovery
Atsushi TOGO | 1538 |
| 10:00 | Resonant raman spectra of Cadmium Sulfide wurtzite: A first-principles simulations study
Ali KACHMAR | 1328 |
| 10:15 | DFT Study of Temperature-dependent Thermal Expansion and Phonon-phonon Coupling in Single-layer MoS ₂ in Monocrystal and Polycrystalline Forms
Konrad WILCZYNSKI | 1378 |
| 10:30 | Coffee break | |

SESSION 6

F06

- | | | |
|-------|--|------|
| 11:00 | Transport of electrons and phonons: scaling the state-of-the-art and improving the theory
Nakib PROTIK | 748 |
| 11:30 | On the origin of charge density waves as an emerging phenomenon from electron-phonon interactions in ZrTe ₅
Raghottam Manoj SATTIGERI | 1585 |
| 11:45 | Mesoscale phonon propagation in Lattice Thermal Quantum Field
Domenica RACITI | 1394 |
| 12:30 | Lunch | |

SESSION 7

F07

- | | | |
|-------|--|-----|
| 14:00 | Accelerating Lattice-Dynamics Calculations with Machine-Learning Tools
Jesús CARRETE | 782 |
|-------|--|-----|

14:30	Deep Potential Molecular Dynamics Study of Au(111)/MX ₂ (M=Mo, W and X = S, Se, Te)/Si Tip Suresh RAVISANKAR	683
14:45	Study of Nanofriction Control in Transition Metal Dichalcogenides using Density Functional Theory and Machine Learning Force Fields Ravikant KUMAR	693
15:00	Investigation of System-Size Dependence in Transport Coefficients with Machine Learning Force Fields Arsenios GKOURRAS	697
15:15	Design rules for doped transition metal dichalcogenides Elliot PERVIZ	525
15:30	Coffee break	

SESSION 8

F08

16:00	Materials simulation with Second Principles: Polar skyrmions, optical properties and polaron mobility Pablo GARCIA-FERNANDEZ	411
16:30	Oxygen Vacancy Stabilization at Ferroelectric Domain Walls: A Molecular Dynamics Simulation Study Hikaru AZUMA	517
16:45	Analysis of nanofriction with collective coordinates Gianfranco ORLANDO	430
17:00	Experimental and Molecular Dynamics simulation study on deformation mechanism of CoCrNi MEA under nanoscratch test Vamsi Krishna MAJETI	1695

POSTER SESSION 2

FP02

17:30	Investigating the Multimeric Protein Complex Structure Involved in Cell Motility Using Molecular Dynamics Simulation and AlphaFold2 Tomoki NOGUCHI	01_1305
17:30	Molecular Dynamics Simulation for Ferroelectric Nematic Liquid Crystals in External Electric Fields Tetsu KATAYAMA	02_1307

17:30	Molecular Dynamics Simulation Reveals Free Energy Landscapes of Supramolecular Mechanophores Machi SASHIKATA	03_1389
17:30	Combined DFT and SCAPS-1D Investigation of Doped SnO as a Hole Transport Layer for Lead-Free Perovskite Solar Cells Faycal DJEFFAL	04_1420
17:30	Protein Adsorption on Alkyl-Substituted Cellulose Interfaces: All-Atom Molecular Dynamics Simulation and Free Energy Calculation Koichiro ISHIBASHI	05_1503
17:30	Atomistic Insights into Ammonia Storage in Deep Eutectic Solvents: Role of Hydrophobicity in Molecular Interactions Erbol USEN	06_1526
17:30	Piezoelectric and Dielectric Properties of Perovskite-type RbNbO ₃ Predicted with Molecular Dynamics Simulation Yuta TAKAHASHI	07_804
17:30	Cr-benzene Complex as a new candidate for molecular spin qubit Soumyasree JENA	08_973

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

18:00 **YOUNG RESEARCHER AWARDS CEREMONY**

18:30 **SOCIAL EVENT**



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FEDERATION OF EUROPEAN
MATERIALS SOCIETIES

Symposium G

Sessions: Room 208 | Main Building

Poster Sessions: Room 237 (Small Hall) | Main Building

CHARACTERIZATION, SIMULATION AND ARTIFICIAL INTELLIGENCE

ARTIFICIAL INTELLIGENCE TO ACCELERATE THE DEVELOPMENT OF NEW ADVANCED MATERIALS FOR ENERGY

Symposium organizers:

Johannes BÜNZ

Paolo BONDAVALLI
(Main Organizer)

Sophia FANTECHI

Valeria NICOLosi

- European Innovation Council
- European Innovation Council
- DG RTD, European Commission
- Trinity College Dublin

Tuesday, 16 September 2025

HIGH-THROUGHPUT METHODS AND AUTOMATED PLATFORMS IMPLEMENTING AI FOR ADVANCED MATERIALS

G05

09:00	Machine Learning for Materials Discovery: From Big Data to Predictive Insights for Energy Applications Silvana BOTTI	1301
09:30	High-throughput materials screening for renewable energy storage using Machine Learning and Artificial Intelligence Josua VIETEN	1213
10:00	Robots, Automation, and Artificial Intelligence: On the Quest for Accelerating Perovskite Research Jesper JACOBSSON	361
10:30	Coffee break	

AI FOR ADVANCED MATERIALS FOR ENERGY I

G06

11:00	Accelerated Optimization of Battery Manufacturing by combining Computational Simulations & AI Alejandro FRANCO	1186
11:30	Accelerated Discovery of Electrolyte Additives for Aqueous Mg-Air Batteries by Machine Learning Darya SNIHIROVA	1430
11:45	AI-Driven Discovery of High Performance Polymer Electrodes for Next-Generation Batteries Subhash V.S GANTI	40
12:00	Cloud-connected Labs of Future for Energy Materials Kourosh MALEK	1460
12:30	Lunch	

AI FOR ADVANCED MATERIALS FOR ENERGY II

G07

14:00	EIC vision on AI for advanced materials Paolo BONDAVALLI	1089
14:30	Effective exploration of the vast design space for metal-based reactive materials using active learning surrogate models Carole ROSSI	139
14:45	Automated Experimental Platform for AI-Driven New Energy Materials Discovery Andy HUANG	770
15:00	Real-time autonomous combinatorial experimentation: from atomic layer synthesis to metal additive manufacturing Ichiro TAKEUCHI	772
15:30	Coffee break	

THEORETICAL APPROACH FOR AI AND MATERIALS

G08

16:00	Shallow Learning for Interpretable and Data-Efficient Inference of First-Principles Hamiltonians Simon M.-M. DUBOIS	1619
16:30	Physics-informed neural network for efficient simulation of coupled fields in structural supercapacitors Davood PEYROW HEDAYATI	1513
16:45	Optimization of multi-principal element alloy compositions using a machine-learning assisted high-throughput methodology Rebekka MAESS	1233
17:00	Physics_Aware Data_Driven Multi_Objective Inverse Design of Battery Cathodes Ali BADAQSHAN	685

POSTER SESSION 2

GP02

17:30	Deep learning model for the design of redox active molecules applicable to AORFBs Byeongjik HAN	01_1146
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- | | | |
|-------|---|---------|
| 17:30 | Challenges and Opportunities in AI-Assisted Research and Materials Acceleration Platforms for Functional High-Entropy Alloys Designed for Harsh and Extreme Environments
Bogdan POSTOLNYI | 02_1417 |
| 17:30 | Influencing factors, limitations, opportunities and segmentation of artificial intelligence application in the energy sector
Tatyana STETSYUK | 03_148 |
| 17:30 | Atomistic and AI-Driven Insights into Ferroelectric Switching in Hybrid Improper Double Perovskite Oxides
Gayathri PALANICHAMY | 04_1547 |
| 17:30 | MaTableGPT: GPT-Based Table Data Extractor from Materials Science Literature
Jiwoo CHOI | 05_1570 |

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

AI FOR GROWTH AND SYNTHESIS OF ADVANCED MATERIALS I

G09

- | | | |
|-------|---|------|
| 14:00 | NanoIC pilot line – addressing sub 2nm leading edge technologies
Inge ASSELBERGHS | 725 |
| 15:00 | Exploring the electronic-structure genome of known inorganics
Nicola MARZARI | 1197 |
| 15:30 | Coffee break | |

AI FOR THERMAL AND VIBRATION DIFFUSION IN ADVANCED MATERIALS

G10

- | | | |
|-------|---|------|
| 16:00 | Machine Learning for Phonon Engineering
Giorgia FUGALLO | 1731 |
|-------|---|------|

16:30	Enabling Automated and Contactless Voice Recognition through an Underwater Vibration Sensor Debasmita SARKAR	894
16:45	Machine Learning-Enhanced Thermal Conductivity Measurements in Thin Films: Integrating Nanoscale Surface Topography and Thermal Analysis Mohsen DEHBASHI	93
17:00	Machine Learning extensions of anharmonic phonon methods Matthieu VERSTRAETE	1390
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

		MATERIALS II	G11
09:00	Metal Doping of TMDC monolayers: A Data-Driven Path to Functional Alloy Discovery M. Sufyan RAMZAN		1448
09:45	Understanding Oxidation Dynamics in Amorphous Boron Nitride via Machine Learning Molecular Dynamics Onurcan KAYA		1070
10:15	Deep Representation Learning for Break-Junction Data Analysis Sam HARLEY		1758
10:30	Coffee break		



2025 Fall Meeting

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Symposium H

Sessions: Room 231 | Main Building
Poster Session: Aula | Physics Building

CHARACTERIZATION, SIMULATION AND ARTIFICIAL INTELLIGENCE

RELIABLE CHARACTERISATION OF FUNCTIONAL NANOMATERIALS AND OF MATERIALS FOR ENERGY STORAGE OR CONVERSION

Symposium organizers:

Claudia **FLEISCHMANN**

Karin **KLEINER**

Matthias **MÜLLER**
(Main Organizer)

Sebastian **WOOD**

- imec and KU Leuven
- Institut national de la recherche scientifique (INRS)
- Physikalisch-Technische Bundesanstalt
- National Physical Laboratory

Monday, 15 September 2025

CHARACTERISATION FOR SUSTAINABLE ENERGY MATERIALS I

H01

09:00	In-Operando Atomic Force Microscopy on Functional Layers in Batteries and Electrochemical Water Splitting Devices Florian HAUSEN	1609
09:30	Atomic-Scale Structural Dynamics at a-Si:H/c-Si Heterointerface During Low-Temperature Thermal Annealing Xianlin QU	1277
09:45	Synthesis and Synchrotron-based Characterization of Ni/Co Oxides Derived from Mixed Metal-TEA Complexes for Thermal Catalytic Biomass Conversion to Chemical Feedstock Suparat SINGKAMMO	1626
10:00	Real-time Raman Monitoring of Ni-based LDHs during the Oxygen Evolution Reaction Madjid TARABET	1594
10:15	Comprehensive Analysis of Hydroxyl Groups in Zeolites Using Advanced Temperature-Programmed Desorption Shunsuke SHIMIZU	1571
10:30	Coffee break	

CHARACTERISATION OF BATTERY MATERIALS I

H02

11:00	Understanding Interfacial Reactions in Li-ion Batteries using X-ray Spectroscopy Combined with Spectral Simulations Robert WEATHERUP	1892
11:30	Unraveling the failure modes of solid-state batteries: an in-situ synchrotron X-ray laminography electro-mechanical analysis Clara AIMAR	388
11:45	Operando chemical analysis of batteries by quantitative x-ray spectrometry Burkhard BECKHOFF	1824
12:00	Synchrotron-based X-ray diffraction and X-ray absorption spectroscopy for in-situ analysis of the enhanced performance and stability of zinc-ion batteries Suttipong WANNAPAIBOON	1094

12:15	Unveiling electronic structures using a new wavelength-dispersive spectrometer for advanced x-ray analysis Adrian JONAS	1402
12:30	Lunch	

NANOMATERIAL CHARACTERIZATION I H03

14:00	X-ray Photoelectron Spectroscopy (XPS): Importance, Challenges, and Significant Opportunities Donald R. BAER	1893
14:30	Chemistry of buried interfaces in III-V heterostructures using lab-scale HAXPES and ToF-SIMS Eugénie MARTINEZ	369
14:45	Quantitative element-sensitive analysis of individual nanoobjects André WÄHLISCH	1315
15:00	Characterization of complex multilayer nanostructures with high aspect ratio Erkki IKONEN	635
15:15	Surface-sensitive metrology on periodic nanostructures with X-ray fluorescence spectroscopy methods Vinh TRUONG	1341
15:30	Coffee break	

NANOMATERIAL CHARACTERIZATION II H04

16:00	Analytical X-ray nanoscopy in the soft and tender X-ray range Andreas HAIDL	1026
16:15	Evidence for the (146 0 -130) diffraction peak in DyScO ₃ using the S-Dirac super-resolution method. Cyril GUEDJ	404
16:30	A Validation Dataset to Benchmark Machine Learning and Conventional Algorithms for the Morphological Characterization of Fractal Aggregates like Soot Tobias KLEIN	1478

16:45	Correlative Metrology of Thermoelectric and Electronic Properties in Nanoscale Materials Using Graphene-Coated Probes and Thermal-Electric Force Microscopy Benjamin ROBINSON	1769
17:00	GIWAXS and GIXAS development at BL7.2W, SLRI Chatree SAIYASOMBAT	1316

POSTER SESSION 1 HP01

17:30	Understanding degradation and durability of Au nanoparticle decorated 2D-MoSe ₂ for Hydrogen Evolution Reaction (HER) using in-situ identical location TEM studies Rajashree KONAR	01_1076
17:30	Machine Learning-Assisted TOF-SIMS Analysis of Wrapping Polymers for Differentiating Carbon Nanotube Diameters Wen-Shan ZHANG	02_1159
17:30	Microstructural study of a peculiar stress-induced reversible phase transformation in YNbO ₄ -modified ZrO ₂ (3Y) Chen-Chia CHOU	03_1164
17:30	Recent experimental determinations of X-ray fundamental parameters at PTB Philipp HÖNICKE	04_1211
17:30	The SMURFnano Project - Surface Functionalities on Nanoparticles and their Standardized Measurement Lena SCHOLTZ	05_1286
17:30	From the EU metrology projects AEROMET I & II to the HE project MI-TRAP - Reliable chemical aerosol analysis by X-ray spectrometry without calibration samples André WÄHLISCH	06_1325
17:30	Potentiometric and Optical Titration for Cost-Efficient Quantification of Surface Functional Groups on Silica Nanoparticles Isabella TAVERNARO	07_1337
17:30	All-Optical Characterization of Elastic Properties of van der Waals Crystals Bartłomiej GRACZYKOWSKI	08_1398
17:30	Waterborne Gas Barrier Coatings and Thin Films Magdalena GRODECKA	09_1465
17:30	SThM thermal conductivity uncertainties on rough surfaces Miroslav VALTR	10_1576

17:30	Improving the Precision of Thermoelectric Atomic Force Microscopy Measurements Sam HARLEY	11_1786
17:30	Matrices for radioactive waste disposal: A structure investigation of $Gd_2(Ti_{1-x}Zr_x)_2O_7$ pyrochlores Carlo CASTELLANO	12_190
17:30	Electrocaloric Analysis of PVDF-TrFE Copolymer Films Prepared Using BCZT Ceramics Ebru MENSUR	13_24
17:30	In-situ investigation of anode reaction in Anion Exchange Membrane Fuel Cell using NAP-XPS Samiran CHAKRABORTY	14_278
17:30	Synthesis of B, P, and S -doped CQDs and its use to enhance the photovoltaic parameters of organic solar cells Cisem KIRBIYIK KURUKAVAK	15_43
17:30	From Binary to High-Entropy: A Nano-Spinel Oxide Series Tuned via Coprecipitation Namhee KIM	16_543
17:30	Thermal-Induced Morphological Transformation of Electrospun Single-Phase Ternary Oxide Nanofibers Joohee LEE	17_557
17:30	Thermally Activated Molecular Gearing Effect Piyush Kanti SARKAR	18_586
17:30	In situ electrochemical scanning microscopy of molecular electrocatalytic process Dong WANG	19_698
17:30	Size-Dependent Photocatalytic Activity of Mesoporous Thiospinel Nanostructures Gerasimos ARMATAS	20_785
17:30	Synthesis of bifunctional Ir_xPt_{1-x} electrocatalysts and investigating the active species evolution during electrochemical reaction via ambient pressure XPS Chia-Hsin WANG	21_993

Tuesday, 16 September 2025

ANALYTICAL TECHNIQUES FOR FUNCTIONAL MATERIALS

H05

09:00	SIMS-based strategies for reliable physico-chemical characterization of advanced functional materials Valentina SPAMPINATO	1419
09:30	Ultra-Low Impact Energy SIMS for Advanced Si-based Defects Characterization in GaAs Adrianna REJMER	1622
09:45	Correlative Multimodal Analytical Workflow with STEM-CL, EDS and EELS for Functional Nanomaterials Paolo LONGO	1611
10:00	Synchrotron-based X-ray Diffraction Microscopy platform for multi-scale analysis of functional materials Agnieszka CORLEY-WICIAK	1331
10:15	Functional Thin Films of 2D Imine-Based Semiconducting Covalent Organic Frameworks for Scalable Electronics Diksha SRIVASTAVA	1834
10:30	Coffee break	

CHARACTERISATION OF BATTERY MATERIALS II

H06

11:00	Characterization of Structure and Defects in Lithium-Rich Layered Oxide as Cathode for Lithium-Ion Batteries Arcangelo CELESTE	869
11:30	High-Performance On-Chip Mesoporous Silicon Anodes Enabled by Surface Sealing through Rapid Thermal Annealing Roza LATIFI	1741
11:45	Advanced Characterisation in Battery Domain: Decoding LNMO Cathodes through Integration of Nanomechanics, Imaging and AI Aikaterini ARGYROU	1253
12:00	Solid-State NMR Investigation of Sulphide-based Solid Electrolyte Louiza LARBI	928
12:15	Exploring Unconventional NMC Cathode Compositions for Advanced Lithium-Ion Batteries Alicja GLASZCZKA	1359

12:30 Lunch

ANALYTICAL TECHNIQUES FOR EFFICIENT SEMICONDUCTORS I H07

14:00	Nanoscale Chemical Characterization of Novel Semiconductor Materials using Tip-Enhanced Optical Spectroscopy Naresh KUMAR	1082
14:30	Nanoscale metrologies for the study of dopant spatial behavior in Semiconductors Richard MORRIS	1185
14:45	3D Insights into Stacking Faults and Elemental Segregation in InGaN/GaN Quantum Wells via Atom Probe Tomography Ruiying SHU	1485
15:00	Development of a Next-Generation STM Break Junction Sam HARLEY	1788
15:15	Flexoelectric modulation of Si and Ge-based nanoscale Schottky barrier diodes Andrea GERBI	
15:30	Coffee break	

CHARACTERISATION FOR SUSTAINABLE ENERGY MATERIALS II H08

16:00	EXAFS investigations of high and medium entropy alloys for electrocatalysis Dirk LÜTZENKIRCHEN-HECHT	1237
16:15	Ambient-Air Degradation and Refurbishing of Ni-Rich NMC Cathodes for Li-Ion Batteries Magdalena WINKOWSKA-STRUZIK	1416
16:30	In-Depth Characterization of Black Mass for Lithium-Ion Battery Recycling Applications Carolina FERNANDES	718
16:45	Construction of MoS2 Nanosheets/Hydrogenated Graphene Hybrid Catalysts for Highly Efficient Electrocatalytic Hydrogen Evolution Xiuxiu HAN	333

- | | | |
|-------|---|------|
| 17:00 | Spatial distribution of crystal polymorphs in ultrathin poly(vinylidene fluoride) films
Michal WYSKIEL | 1369 |
| 17:15 | Combining photoluminescence and ellipsometry in situ of the ALD : A new approach to analyse and optimize ALD materials for photovoltaic applications
Navid MOUHAMAD | 52 |

POSTER SESSION 2 HP02

- | | | |
|-------|---|---------|
| 17:30 | Quantification of Transition Metal Valence States in NCM Cathodes During Charge–Discharge Cycling Using X-ray Emission Spectroscopy (XES)
Hikari TAKAHARA | 01_1015 |
| 17:30 | SoTeXS @ BESSY II: Towards a Multimodal Operando Platform for Electrochemical Systems
Philipp HÖNICKE | 02_1144 |
| 17:30 | Complementary C-AFM/XPS characterisation platform for battery-related materials
Matej HÝVL | 03_1178 |
| 17:30 | Investigating the Electrochemical Performance and Degradation Mechanism of Na ₃ V ₂ (PO ₄) ₃ for Sodium-Ion Batteries
Akshita SHARMA | 04_1227 |
| 17:30 | Enhancing Cycle Life with Solution-Processed Laminar Li ₃ VO ₄ Anodes for Li, Na, and Aqueous Zn-Ion Batteries
Tejveer Singh ANAND | 05_1263 |
| 17:30 | A systematic beam damage study on solid state electrolytes for LiS batteries
Adrian JONAS | 06_1405 |
| 17:30 | Tailoring Solvent Systems to Enhance Li–CO ₂ Mars Battery Performance with RuNi/CSC Cathodes
Surya Babu S | 07_1535 |
| 17:30 | Lead Electrodeposition from Inorganic Precursors: Electrochemical Properties and Structural Evolution on Different Substrates
Ornapsorn HASDIN | 08_1706 |
| 17:30 | Ionic grain conductivity in (Sc,Ce)-stabilized ZrO ₂ ceramic electrolytes: the effect of raw nanopowders origin and sintering regimes
Larysa KHOMENKOVA | 09_1837 |

17:30	Characterization of sodium-ion batteries by ambient pressure hard X-ray photoelectron spectroscopy Satoshi YASUNO	10_343
17:30	Interface stabilization of Li-metal anode with interlayer for sulfide-based all-solid-state batteries Ki-Hun NAM	11_371
17:30	Tailoring Fe ₂ O ₃ Nanostructures for Enhanced Anode Performance in Metal-Air Batteries Duygu CEVHER	12_401
17:30	X-ray Spectrometry Study of Organo-Sulfur Material Hongfei YANG	13_437
17:30	Mitigating silicon anode challenges with solution-processable quasi-defect-free reduced graphene oxide Seung Yol JEONG	14_548
17:30	Surface Decorating Strategy of NCM/Graphene composite for Improved Stability Lithium-Ion Battery Sang Won LEE	15_651
17:30	Graphene/NCM Composites for Enhanced Lithium-Ion Battery Performance via a Surfactant-Free Encapsulation Strategy Jae Hun HWANG	16_652
17:30	Nickel-substituted Manganite Perovskite Na-CO ₂ Battery Sandra SAJEEV	17_687
17:30	Multidentate bonding-induced carbon nano-oligomer assembly for boosting charge transfer and capacitance of textile pseudocapacitors Jinhan CHO	18_741
17:30	Poly(2-ethyl-2-oxazoline)-Based Solid Polymer Electrolytes for Multifunctional Structural Batteries Negar AMIRHAGHIAN	19_78

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

ANALYTICAL TECHNIQUES FOR EFFICIENT SEMICONDUCTORS II

H09

14:00	SI-traceable Calibration of Raman Shifts for Strain Metrology in Semiconductors and 2D Materials Stefan WUNDRACK	1891
14:30	Advanced Correlative Analysis of Crystallographic Defects in Next-Gen Semiconductor Substrates: from micro to nanoscale Giancarlo LA PENNA	707
14:45	Simulation of Interference-Enhanced Raman Amplification for Advanced Microelectronic Applications Damien MONTEIL	399
15:00	Coherent Fourier Scatterometry for Optical Characterization of Anisotropy of van der Waals Materials Anubhav PAUL	1591
15:15	Thermal transport across twisted bilayers of 2D transition metal dichalcogenides Marianna SLEDZINSKA	1439
15:30	Coffee break	

CHARACTERISATION OF BATTERY MATERIALS III

H10

16:00	Ex-situ study of NMC electrodes long-term cycled under various charging protocols Sai Rashmi MANIPPADY	1208
16:15	Microstrain Analysis of Electrode Fabrication Effects in NMC Electrodes Pawel STEPNIICKI	883
16:30	Reliable characterisation of PVDF-based solid polymer electrolytes for energy storage applications Sylwia KOZDRA	1686
16:45	Influence of Charging Strategies on the Structural Evolution of NMC Cathode Materials Alicja GLASZCZKA	1350
17:00	Degradation of LCO in aqueous electrolytes through in situ liquid-cell S/TEM Rui SERRA MAIA	716

- 17:15 Ultrastable Zn-ion Battery with Laser Processed Nano V₂C/V₂O₅ Electrodes for Body Temperature Monitoring 798
Sujit DESHMUKH
- 18:00 YOUNG RESEARCHER AWARDS CEREMONY
- 18:30 SOCIAL EVENT



Symposium I

Sessions: Room 213 | Main Building
Poster Session: Aula | Physics Building

CHARACTERIZATION, SIMULATION AND ARTIFICIAL INTELLIGENCE

FRONTIERS OF IMAGING AND SPECTROSCOPY IN TRANSMISSION ELECTRON MICROSCOPY

Symposium organizers:

Masashi **WATANABE**

Pierre **RUTERANA**

Vesna **SROT**

Yi **WANG**

(Main Organizer)

- Tohoku University
- CEA Grenoble (INAC/SP2M)
- Centre de Recherche sur les ions les matériaux et la photonique
- Nanjing University of Aeronautics and Astronautics

Tuesday, 16 September 2025

TECHNIQUES

I05

09:00	Measuring charge at interfaces in nanocapacitors by in-situ biasing electron holography Martin HYTCH	1590
09:30	X-Ray Absorption-Corrected STEM-EDS Tomography for Absolute Quantification Across Mg-Al-Ca Alloy Interfaces Jessica SNELSON	576
09:45	Novel single particle analysis workflow for atomic-resolution reconstruction of nanomaterials Monika EGGENBERGER	1737
10:00	Novel ns-resolved nano-optical spectroscopies with in the scanning transmission electron microscope Mathieu KOCIAK	1859
10:30	Coffee break	

INSTRUMENTS

I06

11:00	Advancing Spectroscopy and Field-Free Imaging with the Iliad STEM: New Capabilities in Extreme Energy-Loss Data Collection (XEELS™) and Corrected Lorentz STEM Paolo LONGO	1493
11:30	Enhancing the spatial resolution of High-Resolution TEM and STEM datacubes via the S-Dirac super-resolution algorithm. Cyril GUEDJ	469
11:45	In situ straining in TEM: an invaluable tool to investigate deformation mechanisms in materials for nuclear applications Fabien ONIMUS	523
12:00	JEOL: cutting edge products for time resolved microscopy and TEM evolutions Guillaume BRUNETTI	1874
12:30	Lunch	

SEMICONDUCTING MATERIALS I

I07

14:00	Measurement of surface segregation and interdiffusion in the GaAsBi semiconductor alloy system Thomas WALTHER	1529
14:30	Electron Beam damage threshold for nitride semiconductors: carrier dynamics in InN, GaN, and InGaN Alloys Xiaoyi WANG	1652
14:45	Precession Electron Diffraction and In-Situ TEM applied to the study of phase segregation in IGZO compounds Marta AGATI	1023
15:00	Investigation of Residual Strain and Relaxation in Nanowires Based on Semiconductor Compounds via TEM Techniques Slawomir KRET	1172
15:30	Coffee break	

SEMICONDUCTING MATERIALS II

I08

16:00	Atomic-Scale Imaging of Hydrogen-Induced Platelet Defects in Proton-Bombarded n-Type GaAs Using Probe-Cs-Corrected STEM Ezra Jacobus OLIVIER	1343
16:30	Atomic-Scale Structural Dynamics at a-Si:H/c-Si Heterointerface During Low-Temperature Thermal Annealing Xianlin QU	1632
16:45	Investigation of vacancy-like defects in monolayer of WSe ₂ using differential phase contrast imaging in the scanning transmission electron microscope Maja GROLL	829
17:00	From Miscibility to Unexpected Separation: In-Situ TEM Insights into Au-Pd Alloy Behavior at High Temperatures Abhijit ROY	1457
17:15	Investigation of planar defect evolution in Au-Pd-Pt-Ru-based compositionally complex solid solution thin films using analytical transmission electron microscopy Miran JOO	55
17:30	Revealing defects in nitride semiconductor structures in TEM Julita SMALC-KOZIOROWSKA	1860

POSTER SESSION 2

IP02

18:00	Growth Phase Diagram of NbN on AlN Investigated by Electron Diffraction and Modeling Anna KALETA	01_1311
18:00	Study of Potassium Diffusion at asymmetric 36.9° SrTiO ₃ tilt Grain Boundary Qian MA	02_1354
18:00	3D Electron Diffraction Study on the Local Structure of a doped Metal-organic Framework TCNQ@ZIF-4 Jianbo SONG	03_1665
18:00	Cross-Sectional Analysis of Porcelain from the “Nanhai I” Shipwreck Houyi HUANG	04_1684
18:00	A rapid, accurate and robust method for atomic column locating Yi WANG	05_1765
18:00	Real-time In-situ TEM Analysis of Interfacial Behavior in Cu-based Micro-bumps under Combined Stress Conditions Yoon Kyung SEO	06_612
18:00	Atomic-Scale Analysis of Ferroelectric Polarization in Perovskite Oxides Zheng HU	07_855

Wednesday, 17 September 2025

9:00 PLENARY SESSION

12:30 Lunch

OXIDES AND FUNCTIONAL MATERIALS I

I09

14:00	Scanning precession nano beam electron diffraction strain mapping of $\text{-(InGa)}_2\text{O}_3/\text{-Ga}_2\text{O}_3/\text{Al}_2\text{O}_3$ layers Marco SCHOWALTER	1592
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14:30	Irreversible Lattice Expansion Effects in Nanoscale Indium Oxide for CO2 Hydrogenation Catalysis Mengsha LI	1598
14:45	An in situ TEM study of the formation and thermal stability of crystalline phases in solidified Au–Ge alloy nanoparticles Olha KSHANOVSKA	904
15:00	In Situ TEM on Off-Stoichiometric SrTiO3 and Ga2O3 Dan ZHOU	502
15:30	Coffee break	

OXIDES AND FUNCTIONAL MATERIALS II
 110

16:00	Localized Phenomena in Quantum and Energy Heterostructures Revealed by Multimodal STEM Hongguang WANG	1840
16:30	Strain and Domain Landscape in Pbnm Orthorhombic LaFeO_ Thin Films: Implications for Photoresponse in Epitaxial Heterostructures Mario VILLA	1109
16:45	In operando studies of solid oxide electrolysis and fuel cells by transmission electron microscopy Soren Bredmose SIMONSEN	1022
17:15	The Functional and Structural Significance of Surface Layer in Rodent Incisors: Mechanisms of Coloration and Material Optimization Vesna SROT	729
17:30	Characterization of crustacean biomaterials using analytical transmission electron microscopy Miloš VITTORI	1861
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

OXIDES AND FUNCTIONAL MATERIALS III

I11

09:00	Robust Analysis Tool for Position Averaged Convergent Beam Electron Diffraction Patterns and Quantitative Scanning Transmission Electron Microscopy using a Foundation Model Daesung PARK	1085
09:30	TEM Investigation of Point-Defect Formation in $_{-}(\text{Al}_x\text{Ga}_{1-x})_2\text{O}_3$ Single Crystals Arub AKHTAR	1121
09:45	Atomic-Scale Investigation of Symmetry-Forbidden LaAlO_3 (001)/ $\text{La}_{0.67}\text{Sr}_{0.33}\text{MnO}_3$ (111) Interfaces Yuhan WANG	1811
10:00	Triggering and tracking defect phase transformation at atomic resolution Siyuan ZHANG	130
10:30	Coffee break	

FRONTIERS IN METHODS I

I12

11:00	Imaging and EBIC of oxide and semiconductor interfaces A.M. SANCHEZ	1875
11:30	Revealing stacking-induced domains in multilayer PtSe_2 using quantitative 4D-STEM structural mapping Hanako OKUNO	1475
11:45	Exploring 4D-STEM in SEM with an Event-Driven Direct Electron Detector: Low-Dose, High-Speed, and Sparse Data Bowen LIU	822
12:00	Imaging of point defects and correlated structural distortions at the atomic scale in metal oxides Zhen CHEN	1219
12:30	Lunch	

FRONTIERS IN METHODS II

I13

14:00	Phonon spectroscopy and beyond in the electron microscope at high spatial or momentum, and energy resolutions Quentin M. RAMASSE	1862
14:30	Characterizing electrical properties of semiconducting materials at nm length scales by 4D Transmission Electron Microscopy Martien Ilse DEN HERTOOG	1863
15:00	Revealing the Mechanism of Gas-Solid Interface Interactions Using Environmental Scanning Electron Microscopy Zhujun WANG	1888



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Symposium J

Sessions: Room 219 | Main Building

Poster Session: Room 237 (Small Hall) | Main Building

THIN FILM, FLEXIBLE AND COMPOSITE MATERIALS AND THEIR FORMATION TECHNIQUES

UNCONVENTIONAL MATERIALS AND FLEXIBLE ELECTRONICS FOR SUSTAINABLE TECHNOLOGIES

Symposium organizers:

Denys **MAKAROV**

Giuseppe **CANTARELLA**
(Main Organizer)

Manish K. **TIWARI**

Niko **MÜNZENRIEDER**

- Helmholtz-Zentrum Dresden-Rossendorf e.V.
- University of Modena and Reggio Emilia
- UCL Mechanical Engineering,
University College London
- Free University of Bozen-Bolzano

Monday, 15 September 2025

SESSION 1

J01

08:30	Dynamically Responsive Organic Optoelectronic Materials Ye TAO	1251
08:45	Electronic biosensing systems: from rigid to flexible and biodegradable platforms Larysa BARABAN	1057
09:00	Large-scale fabrication of indium oxide nanowire and MoS2 nanoflake channel transistors using a combination of high throughput solution processing techniques Subho DASGUPTA	1812
09:30	Smart Flexible Materials in Prosthetics and Orthotics: Toward Personalized, Sensor-Integrated Systems Jose GONZALEZ-VARGAS	1809
10:30	Coffee break	

SESSION 2

J02

11:00	Flexible robotic materials with programmable magnetization: modeling, prototyping and potential applications Veronica IACOVACCI	1692
11:30	Self-Maintainable Electronic Materials with Skin-Like Characteristics Alireza DOLATSHAHI-PIROUZ	1659
12:00	Flexible light-emitting materials and devices Wei HUANG	1688
12:15	High-accuracy Image Recognition using Biodegradable Synaptic Transistors Fabricated with Rhodophyta-extracted Materials Somnath BHATTACHARJEE	1536
12:30	Lunch	

SESSION 3

J03

14:00	Perovskite photovoltaics, light-emitting diodes and X-ray detectors for flexible electronics Wei HUANG	793
14:30	Printable Nacre-Mimetic MXene Nanocomposite Sensors for Health Monitoring Using Machine Learning Lulu XU	1871
15:00	Sustainable, High-Performance, Flexible Paper-based Functional Thermoelectric Generators from CuXYS ₃ (X= 2, 3 and Y= Sn, Bi) Nanocrystals Surajit DAS	1582
15:15	Force-Sensorised Surgical Gloves: Evaluating Viscoelastic Interactions for Accuracy in Stiffness Characterisation Thurga Reshe NAVASEELAN	921
15:30	Coffee break	

SESSION 4

J04

16:00	Edible, Flexible and Smart: Redefining Electronics with Natural Biopolymers Dimitrios PAPAGEORGIOU	57
16:30	Flexible Devices: From Healthcare to Agriculture Firat GUDER	500
17:00	Study of Structural Changes Induced in Copper-based Metal Organic Framework during Photocatalytic Dye Degradation of Methylene Blue using Vibrational Spectroscopy Sonia .	1655
17:15	Flexible perovskite oxide LaFeO ₃ layers investigation Edyta CHLOPOCKA	923
17:30	Solution-processed organic LEDs Guohua XIE	1623

17:45

Powering Electrochemical Biosensors with Rechargeable Aqueous Micro-Batteries
Yeonkyung LEE

1105

Tuesday, 16 September 2025

	SESSION 5	J05
08:15	Edible Hydrogen Peroxide Biosensor for Monitoring Gut Metabolites and Peroxidase Activity Valerio Francesco ANNESE	1527
08:30	Autonomous, High_Fidelity Dissolved Oxygen Sensing via Photonic Films for Dynamic Ocean Monitoring Manish K. TIWARI	1166
08:45	Detection of Protease Activity using a Paper based Sensor Cláudia SILVA	1431
09:00	High-Performance Vitrimers for Sustainable Electronics Daniel SCHMIDT	1472
09:30	Plant wearable sensors towards precision agriculture Snezana DJURIC	819
10:00	A 3D printed aqueous organic sodium-ion battery based on cross-linked PEDOT:PSS-containing electrodes Evan FISHER	1292
10:15	Sustainable Soft Sensor Design by Machine Learning Tools Haitao YANG	1557
10:30	Coffee break	

	SESSION 6	J06
11:00	ZnO quantum dots and mechanochemically engineered halide perovskites for game-changing improvements in light harvesting devices Janusz LEWINSKI	1141

11:30	Printable sustainable-by-design materials for ubiquitous flexible electronics Zlatka STOEVA	907
12:00	Printable Piezoresistive Foam Sensors for Pressure Monitoring in Surgical Applications Maryam JAVIDAN	561
12:15	Skin-Compatible AgZn(MoO ₃)(WO ₃)/PDMS Composite for Piezoelectric Sensing and Energy Harvesting in Wearable Eye-Tracking Devices Sasikumar RAGU	185
12:30	Lunch	

SESSION 7

J07

14:00	Circular and Sustainable RF-Enabled Wireless Flexible Electronics Mahmoud WAGIH	1895
14:30	Biomass based skin-integrated triboelectric sensors Wenzhuo WU	79
15:00	Energy-Efficient Electronic Devices Fabrication Using TENG-Powered Nanomaterials assembly Mohammed Hadhi PAZHAYA PUTHANVEETIL	1805
15:15	Flexible paper-based OECT for biological sensing Sumantha Aithal PANAMBUR	275
10:30	Coffee break	

SESSION 8

J08

16:00	Ecosystem-centered robot design: Towards Ecoresorbable Sustainability Robots Florian HARTMANN	840
16:15	From Hierarchical Composites to Self-Healing Silicones: A Materials Approach to Sustainable Stretchable Electronics Rafael LIBANORI	140

16:30	Controlled Growth of two-dimensional (C ₄ H ₉ NH ₃) ₂ PbBr ₄ Fast Scintillator for Particle Discrimination and Dynamic X-Ray Imaging Shilin LIU	160
16:45	Printed Recyclable Magnetoresistive Sensors and Temperature Sensors Lin GUO	447
17:00	Molded, Solid-State Biomolecular Assemblies with Programmable Electromechanical Properties Krishna HARI	1115
17:15	Perovskite field-effect transistors and light-emitting transistors Zhongbin WU	994

POSTER SESSION 2 JP02

18:00	Stretchable, breathable, and selectively transformable devices into sensors and electrodes based on structural deformation of nanomesh Juhee SHIN	01_1032
18:00	Deep Eutectic AlCl ₃ -EMIC:GdnHCl Electrolyte for Flexible Aluminum-Graphite Batteries Karthik NAMACHIVAYAM	02_1033
18:00	Ultra-thin, high-resolution, transfer-printed breathable electrodes for seamless integration with electronic skin devices Hyeokjoo CHOI	03_1037
18:00	Breathable, Conformable, and Micro-Patterned Wearable Piezoelectric Energy Nanogenerator with Increased Energy Conversion Efficiency Jihoon BAE	04_1071
18:00	Magnetic La _{0.7} Sr _{0.3} MnO ₃ membranes synthesized by etching a Sr ₃ Al ₂ O ₆ sacrificial layer using an intermediary manganite protection layer Moussa MEZHOUD	05_1173
18:00	High-Performance CMOS-Like Inverter Based on Well-Balanced Ambipolar Transistor Nak Hee KANG	06_1265
18:00	Uniaxial Conjugated Polymers Chain alignment for 2D Charge Transport Jin Seok YOON	07_1271

18:00	Preparation of Porous TPU Substrates via Non-Solvent-Induced Phase Separation for Wearable Electronics Doga DOGANAY	08_1428
18:00	Semiconducting Conjugated Polymer Nano-Network Structures for High Performance Phototransistors Ji Hyeok HWANG	09_1440
18:00	Cocrystal engineering towards high electron mobility organic semiconductors Arkalekha MANDAL	10_1467
18:00	Photo-adaptive Visuomorphic Electronics for Efficient Machine Vision Haifeng LING	11_1518
18:00	Wet-Spun Core-Shell TPU/TiO ₂ Fibers for High-Performance Triboelectric Nanogenerators and Wearable Electronics Onur DEMIRCIOGLU	12_1664
18:00	FTIR Characterization of Hot-Pressed Green Composites Using Recycled Concrete Powder, Cellulose, Hemicellulose, and Lignin Ejazulhaq RAHIMI	13_1740
18:00	Sustainable and Green Solvents for Zinc Ion-Batteries Recep YUKSEL	14_1795
18:00	Flexible Piezoelectric Energy Harvesters Using Biodegradable Electrospun Silk Nanowebs Chang Kyu JEONG	15_262
18:00	Proton-conducting membranes made from plant-based proteins as sustainable and biodegradable green alternatives for fuel cell applications Ziyu YANG	16_315
18:00	Biocompatible and Flexible High-k Dielectric Materials for Transient Electronic Applications Sangho CHO	17_47
18:00	Machine Learning-Assisted PVDF-HFP-Based Triboelectric Nanogenerators for Early Prediction of Knee and Foot Injuries Asma AKTER	18_501
18:00	Environmentally Sustainable and Degradable Carboxymethyl Cellulose (CMC) Based Aqueous Zinc-ion Battery Seungmin HYUN	19_539

18:00	Transient and Biocompatible Chitosan-Based Thin-Film Temperature Sensors Aiming Sustainable Electronics and Multifunctional Sensing Alessandro ALLEVA	20_599
18:00	Crawling Soft Robot Locomotion by Asymmetric Temperature Distribution On Paper-based Electrodes Seongyeol KIM	21_618
18:00	Controlling GaN Nanorod Growth on Flexible Tantalum Foils via Surface Nitridation: From Interface Chemistry to Field Emission Performance Bipul Kumar PRADHAN	22_943

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

		SESSION 9	J09
14:00	Steering Miniaturized Agents Sarthak MISRA		1606
14:30	Embedding electronics within a yarn-like structure to create electronic textiles: Recent developments and applications Theo HUGHES-RILEY		695
15:00	Development of Polypyrrole Electrodeposited in a Supercritical Carbon Dioxide-in-Water Emulsified Electrolyte for Next-Generation Flexible Devices Punvinai VINAISURATERN		77
15:15	Sustainable Flexible Electronics Based on Fish Gelatin Hai-Dong YU		795
15:30	Coffee break		

SESSION 10

J10

16:00	Degradable Materials and Sensors for Environmental and Plant Health Monitoring Pietro CATALDI	487
16:30	Electronic Systems Based on Emerging and Non-Standard Materials and Fabrication Technologies Almudena RIVADENEYRA	283
17:00	From Marine Sponge ECG Electrodes to Wooden Floor Dryers: Use of Bio-Based Substrates in Combination with Carbon Nanomaterials Agnieszka LEKAWA-RAUS	104
17:15	Imperceptible magnetoresistive sensors for interactive magnetoelectronics Rui XU	717
17:30	Electrogelation: An alternative route for the deposition of PEDOT:PSS and its copolymers for Bioelectronics Antonio DOMINGUEZ-ALFARO	701
17:45	Versatile Green Transfer Printing of Magnetoelectronics for Interactive Electronics Olha BEZSMERTNA	316

Thursday, 18 September 2025

SESSION 11

J11

08:00	Fabrication of flexible substrate with partially embedded back-contacts for piezoelectric zno-based arms movement sensors Habeebur RAHMAN	492
08:15	Novel terpineol-based silver nanoparticle ink with high stability for ink-jet printing Boris POLYAKOV	625
08:30	Hysteresis in Organic Electrochemical Transistors Ramesh KUMAR	624
08:45	Wetting-Mediated Sacrificial-Layer-Free Transfer of Large-Area Ultra-Thin Electronics Riccardo ZAMBONI	131

09:00	Leaftronics: Natural lignocellulose scaffolds – A Sustainable Substrate for Reliable Printed and Conventional Electronics Hans KLEEMANN	156
09:30	Empowering the Next Billion Devices: Low-Power TFTs for Displays and IoT Pedro BARQUINHA	1497
10:00	Eco-Friendly and Multifunctional Ionogels for Thermo-Tactile Perception in Soft Robotic Manipulation Lorenzo MIGLIORINI	436
10:15	Electronic Skin for Energy Harvesting and Health Monitoring: A Triboelectric Nanogenerator with Sweat Sensing Capabilities Md Mehedi Hasan APU	504
10:30	Coffee break	
SESSION 12		J12
11:00	Celebrating the 10th anniversary of the journal Advanced Electronic Materials: a decade of excellence and innovation Gaia TOMASELLO	1890
11:30	MoS ₂ Nanogap Memristive Devices for Energy-Efficient Neuromorphic Computing Roshni SATHEESH BABU	1075
12:00	Cyanobacterial Polysaccharide ‘Sacran’ for Ultrathin Flexible and Biodegradable Organic Electrochemical Transistors Serpil TEKOGU	372
12:15	Redesigning Epoxy Resins for the Circular Economy: Imine Vitrimers as Reprocessable Alternatives Sharine Noelle BENDULO	230
12:30	Lunch	
SESSION 13		J13
14:00	Contact-controlled transistors for sustainable temperature sensing and display arrays Radu SPOREA	68

14:30	Natural Dielectrics for Bio-Organic Electronics Mihai IRIMIA-VLADU	1058
15:00	Fabrication of Flexible High-k Dielectric CuO-Loaded PVA/Chitosan-Based Sustainable Ternary Nanocomposites for Energy Storage Applications Tajamal HUSSAIN	453
15:15	Biodegradable Microwave Cavity Resonator Mohammad Javad BATHAEI	267
15:30	Coffee break	

SESSION 14

J14

16:00	Ultra-thin and flexible FlexICs for low-cost, low-carbon edge and item-level intelligence at scale Julio COSTA	691
16:30	Electrochemical Capacitors as a Sustainable Energy Storage Device using Advanced Functional Materials for Flexible and Wearable Applications Libu MANJAKKAL	1889
17:00	Sustainable and Air-Stable Zinc Inks for Printed Flexible Electronics Using Cellulose Binder and Multistep Sintering Strategy Naveed ALVI	346



Symposium K

Sessions: Room 103 | MINI Building

Poster Session: Room 237 (Small Hall) | Main Building

THIN FILM, FLEXIBLE AND COMPOSITE MATERIALS AND THEIR FORMATION TECHNIQUES

3D AND ADDITIVE MANUFACTURING OF ORGANIC MATERIALS AND NANOCOMPOSITES FOR ADVANCED APPLICATIONS

Symposium organizers:

Antonio **DOMINGUEZ-ALFARO** – University of Cambridge

Eleonora **FERRARIS** – KU Leuven

Miriam **SEITI** – University of Brescia,
– KU Leuven

Miryam **CRIADO-GONZALEZ** – Spanish National Research Council
(Main Organizer)

Tuesday, 16 September 2025

LIGHT-BASED PRINTING: SLA AND DLP

K05

08:30	3D Printed Bioelectronic Model of the Intestinal Tissue Architecture Maria LOPEZ CAVESTANY	207
09:00	Sustainability aspects in vat photopolymerization; from recyclable resins to pseudothermoplastic materials Xabier LOPEZ DE PARIZA	238
09:30	Designing Lightweight Mechanical Metamaterials for AM Using Hybrid and Functional Architectures Kashif AZHER	211
09:45	Additive Manufacturing for Flow Biocatalysis William PRITCHARD	503
10:30	Coffee break	

LIGHT-BASED PRINTING: SLA AND DLP

K06

10:30	Hybrid fabrication of bioelectronic devices Johannes GURKE	245
11:00	Printable Soft Electronics for Epidermal Healthcare Interfaces Fabrizio Antonio VIOLA	571
11:30	Metal elements doped SiOC based negative Poisson's ratio structure to activate efficient piezoresistivity and temperature detection performance Taotao HU	874
11:45	Volumetric additive manufacturing of composites via hydrogel infusion Daryl YEE	246
12:00	Scaling up in-vitro, real-time cell monitoring through large area printing of PEDOT:PSS OECTs Francesco DECATALDO	589

12:30 Lunch

LIGHT-BASED PRINTING: SLA AND DLP
K07

14:00	Novel Sustainable Materials for Green Electronics Shweta AGARWALA	1505
14:30	Additive Manufacturing of Functionalized Glass Vapour Cells for Next-Generation Quantum Technologies Feiran WANG	860
14:45	Tomographic Volumetric Bioprinting On A Chip Riccardo RIZZO	293
15:15	Bone Scaffolds Made of Bioactive Glass by Two-Photon Lithography Leonhard HAMBITZER	1495
15:30	Coffee break	-

LIGHT-BASED PRINTING: SLA AND DLP
K08

16:00	Two-Photon Absorption based 3D Printing of Nanocrystals for Circularly Polarized Photodetectors Fu LI	1
16:15	3D Macro and Micro Printing of Semiconductor Based Photoresins and Their Optoelectronic Applications Ozan KARAKAYA	222
16:30	In-situ Study on Defect Formation Mechanisms in TC4 Titanium Alloy Fabricated by Laser Powder Bed Fusion Additive Manufacturing Jun WANG	891
16:45	Catalyst Surface Engineering for Electroless Plating on Glass Interposers Seeun NAM	647
17:00	Gas-Triggered 3D Printing of Calcium Carbonate Structures via Localized CO ₂ -Induced Mineralization Chenxing XIN	704

17:15	Self-assembled Bioactive Protein/HA/CUR-based amyloidogenic nanohydrogel dressing for rapid infected diabetic wound healing via enhanced angiogenesis and anti-inflammation Saurabh Kumar SRIVASTAVA	1807
17:30	Additively Manufactured Functional Materials with Embedded Sensing and Actuation Robert NAWROCKI	28
17:45	Investigation into the Interlaminar Fracture Toughness of Composites Based on a Novel Gel-DCPD Prepreg Xu CAO	873

POSTER SESSION 2 KP02

17:30	Tip-assisted Electrohydrodynamic Printing of Out-of-Plane Tactile Sensor for Surgical Applications Junhao CHEN	01_1072
17:30	Multi-material 3D printing of flexible piezoelectric sensors using electroactive composite materials custom-produced via scalable and sustainable melt processing Rolanas DAUKSEVICIUS	02_1364
17:30	Aerosol Jet Printed Hydrogel-Based Ionic Conductors for Wearable and Implantable Bioelectronics Madeshwaran SEKKARAPATTI RAMASAMY	03_1716
17:30	CNT-Grafted ZnO Tetrapod Nanofillers for High-Performance Carbon Fiber Reinforced Polymers Manjeet Singh GOYAT	04_1792
17:30	3D Printed Injectable Protein-Cellulose Hybrid Hydrogel Dressing For Rapid Wound Healing With Enhanced Antioxidant And Anti-Inflammation Properties Saurabh Kumar SRIVASTAVA	05_1808
17:30	3D printable/injectable personalized amyloidgenic hydrogel for accelerated wound healing and tissue regeneration Shikha TRIPATHI	06_1847
17:30	Thin film p-n junction of organic-inorganic quinoline derivative/titanium dioxide for optoelectronic purposes Luis SCALVI	07_208
17:30	Degradable Substrates for Extended-Gate Electrode Arrays in Field-Effect Transistor Biosensors Bogdana DORDEVIC	08_442

17:30	Advancing Organic Electronic Devices through Spin Crossover Nano Material Integration Shiv Prakash VERMA	09_66
17:30	3D-printed carbon-based electrodes for electrochemical flow reactors Wei GUO	10_723
17:30	3D printed barocaloric composites for refrigeration and cold storage applications Ángel FERRADANES MARTÍNEZ	11_791
17:30	Magnetopiezoelectric Biopolymer Nanocomposites with Quantum Dot Crystals: A Novel Approach for Neural Tissue Engineering Hossein MALEKI GHALEH	12_868

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

PRINTED BIO-ELECTRONICS

K09

14:00	Printed stretchable electronics based on nanocomposites and conductive liquids Klas TYBRANDT	19
14:30	Customized 3D Architectures of Degradable Hydrogels for Impedimetric Biosensing Interfaces and Mimicking of the Tumor Microenvironment Željko JANICIJEVIC	478
15:00	Development of Molecularly Imprinted Polymer (MIP)-Based Sensors for Biomarker Detection Using Aerosol Jet Printing Technology Anjana Ramesh PERINGATH	1427
15:15	Inkjet-Printing of LowD Materials: towards flexible and wearable healthcare sensing devices Charlie HEATON	519
15:30	Coffee break	

PRINTED BIO-ELECTRONICS		K10
16:00	Liquid Metal Stretchable Electronics: Production and Reliability Monika RAI	1049
16:30	Beyond poly(3-hexyl-thiophene) thin films: strategies for nanoporous and 3D structuring for bioelectronics Ilaria ABDEL AZIZ	677
17:00	Direct Ink Writing of Poly(ionic liquid) based conductive composites Sagar BHAGWAT	1595
17:15	3D-printed biohybrid interfaces: integrating conjugated polymer nanoparticles for advanced biophotonic applications Manuela CIOCCA	1229
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	



Symposium L

Sessions: Room 105 | Faculty of Mathematics
Poster Session: 237 (Small Hall) | Main Building

THIN FILM, FLEXIBLE AND COMPOSITE MATERIALS AND THEIR FORMATION TECHNIQUES

PROGRESS IN UNDERSTANDING FUNDAMENTAL, FUNCTIONAL MATERIAL AND HEALTH ASPECTS OF MELANINS, POLYDOPAMINE AND RELATED POLYINDOLE QUINONE MATERIALS

Symposium organizers:

Albertus **MOSTERT**

– Swansea University

Carlos **F.O. GRAEFF**
(Main Organizer)

– Universidade Estadual Paulista
“Julio de Mesquita Filho”

Pooi See **LEE**

– Nanyang Technological University

Monday, 15 September 2025

SESSION 1

L01

09:00	Reflections on Challenges and Opportunities Related to the Formation, Molecular Structure and Properties of Polydopamine Coatings Phillip MESSERSMITH	60
09:30	Self-Assembly of Chiral Polycatecholamines Particles Radoslaw MRÓWCZYNSKI	1342
09:45	Hollow polydopamine spheres decorated with MoS ₂ nanosheets for hydrogen evolution reaction Murilo SANTHIAGO	109
10:00	Beyond the Binary: A Perspective on the Coexisting Forms of Synthetic Melanin Valentina MARASSI	1599
10:30	Coffee break	

SESSION 2

L02

11:00	Melanin Catalysts for Sustainable Processes Paola MANINI	580
11:30	Nanoscale Melanin Patterning via Scanning Electrochemical Cell Microscopy (SECCM) for Nanoelectrode and Optical Applications Noah AL-SHAMERY	951
11:45	Rediscovering Natural Melanins from unexpected sources: Unlocking Chemical, Physical, Biological, and Electrical Potential Marianna AMBRICO	167
12:30	Lunch	

SESSION 3			L03
14:00	Synthetic Melanin as a Physicochemical Platform for Peptide-Based Cancer Vaccines: From Nanostructure to Clinical Application Antoine F. CARPENTIER		1899
14:30	Bioactive Composite Scaffolds for Advanced Biomedical Applications: The Merger of Melanin Pigments and Photo-crosslinkable Polymers for the Design of Versatile Bioinks Simone POTENTI		1216
14:45	A View of Melanin's Structure Through the Lens of Model Compounds Jean-Philip LUMB		1443
15:30	Coffee break		

SESSION 4			L04
16:00	Towards a theoretical melanin platform Lluís BLANCAFORT		04_289
16:30	Harnessing BSF-Eumelanin & Keratin derived from Waste for sustainable Inkjet Impedance Humidity Sensors Marianna AMBRICO		04_289
16:45	Enhancing Charge Storage in Melanin via Sulfur Functionalization for Supercapacitor Applications Joao Victor MORAIS LIMA		273
17:00	Fundamental investigation of broad band absorption and charge transfer properties in natural eumelanin. Vishal GHADGE		1660

POSTER SESSION 1			LP01
17:30	Characterization of Stacked Polydopamine Membranes for Stimuli-Responsive Applications Adam KRYSZTOFIK		02_1484

- | | | |
|-------|--|--------|
| 17:30 | <p>From CUMIN seeds to NIGELLA Melanin: Extraction/ Physics/Chemistry and perspectives in sustainable device engineering.</p> <p>Marianna AMBRICO</p> | 03_286 |
| 17:30 | <p>Unconventional Melanin from Fungi: extraction, chemistry and electrical response of Aspergillus Carbonarius</p> <p>Marianna AMBRICO</p> | 05_496 |
| 17:30 | <p>Eumelanin-Driven Interfacial Passivation Strategies for Enhancing Perovskite Solar Cell Stability</p> <p>Joao Vitor PAULIN</p> | 06_73 |



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Symposium M

Sessions: Room 103 | Faculty of Mathematics

Poster Session: 237 (Small Hall) | Main Building

THIN FILM, FLEXIBLE AND COMPOSITE MATERIALS AND THEIR FORMATION TECHNIQUES

NEXT-GENERATION THIN FILMS: INNOVATIONS IN PVD AND CVD TECHNIQUES

Symposium organizers:

Kostas **SARAKINOS**

Petru **LUNCA POPA**
(Main Organizer)

Rodica **PLUGARU**

Silviu **COLIS**

- University of Helsinki
- University of Luxembourg
- National Institute for Research and Development in Microtechnologies
- University of Strasbourg

Monday, 15 September 2025

SEMICONDUCTOR FILMS

M02

11:00	Key Points of Compound Semiconductor Material Evaluation by High resolution XRD Shyjumon IBRAHIMKUTTY	256
11:45	Ex-situ incorporation of Al in Ge by sputter deposition and pulsed laser melting: a new approach to fabricate hyper-doped Ge:Al alloys Enrico DI RUSSO	1092
12:00	Mapping the Optoelectronic Properties of Bi2FeCrO6 Thin Films Across the Epitaxial Growth Conditions Chenyue HU	1336
12:15	RF Magnetron Co-sputtered GeSe2-Bi2Se3 Thin Films for Photonic Applications: Influence of Rapid Thermal Annealing Anupama VISWANATHAN	32
12:30	Lunch	

ADVANCES IN CVD AND ALD TECHNIQUES

M03

14:00	Low-temperature, fast printing of oxide thin films for energy and environmental applications David MUNOZ-ROJAS	1589
14:30	Exploring New Precursor Pathways for ALD of NiO: Impact on Structure and Photoelectrochemical Response Vyshnav KANNAMPALLI	438
15:00	MOCVD-Grown Nanostructured Calcium Ferrite thin films for efficient Dye Degradation Laura SALAMONE	854
15:15	Single Step Synthesis of Boron Doped Carbon Nanowalls via MWPECVD as Multifunctional Interfaces for Directional Water Transport and Electrowetting Deepak DEEPAK	1112

15:30 Coffee break

VAPOR-BASED SYNTHESIS OF THIN OXIDE FILMS

M04

- | | | |
|-------|---|------|
| 16:00 | Effect of growth conditions on oxide thin film obtained by magnetron sputtering
Dan-Gheorghe DIMITRIU | 241 |
| 16:30 | Crystalline HfZrO ₂ formation from (HfO ₂) _m /(ZrO ₂) _n nano-laminate and amorphous HfZrO ₂ by atomic layer deposition and annealing process
Toshihide NABATAME | 784 |
| 16:45 | Engineering the Ferroelectric Properties of Bi ₂ FeCrO ₆ Thin Films
Silviu COLIS | 1425 |
| 17:00 | Approaching the Insulator-to-Metal Transition (IMT) in ALD-Deposited VO _x : Significant Impact on a Broad IR Transmission Range
Christophe LABBÉ | 1353 |
| 17:15 | Innovative β-diketonate Alkali Metal Precursors for Lead Free Piezoelectric Films
Stijn ENGELAAR | 497 |

Tuesday, 16 September 2025

FUNDAMENTALS OF THIN FILM GROWTH

M06

- | | | |
|-------|---|------|
| 11:00 | Competitive growth between Amorphous and crystalline phases in thin films: Modelling the kinetics, local scale characterization, and functional properties
David HORWAT | 1558 |
| 11:30 | Decoupling the effects of kinetic energy and potential energy of ions on the crystallinity of thin films in cathodic arc deposition
Yeliz UNUTULMAZSOY | 370 |
| 11:45 | Influence of bias voltage on the microstructure and mechanical properties of TiN, ZrN and TiZrN coatings prepared by reactive magnetron sputtering in industrial conditions
Sahand BEHRANGI | 1647 |

12:00	Role of hydrogen dynamics and deposition conditions in photochromic YHO/MoO3 bilayer films Martins ZUBKINS	1602
12:30	Lunch	

FUNCTIONAL SURFACES M07

14:00	Carbon Nitride Thin Films for Artificial Photosynthesis Paolo GIUSTO	39
14:30	Conformal Atomic Layer Deposition of Metallic Nanoparticles on 3D Substrate to Enhance Electrocatalytic Activity of Transition Metal Electrocatalysts for Hydrogen Electrolysis Alireza SHARIFIRAD	1079
14:45	Large-Surface Diamond Electrodes—Increase efficiency by 1000% Mengai MAO	731
15:00	From Corrosion Shielding to Ultra-Low Friction: A Hybrid Strategy Using a-C:H Coatings and Graphene-CNT Composites Pankaj BHARTI	1690
15:15	A Highly Sensitive and Selective Hydrogen Gas Sensor Based on WS2-Decorated PdSe2 Nanostructures Suresh KUMAR	537
15:30	Coffee break	

HIGH THROUGHPUT DESIGN OF THIN FILMS M08

16:00	Design and multifunctional applications of high-entropy material films Wenyi HUO	1414
16:30	From Surface to Statistics: Quantitative grain size analysis of MoS2 thin films using Atomic Force Microscopy (AFM) Aashi GUPTA	676

16:45	Data-Driven Exploration of Transparent Conductors Using Combinatorial Chemistry, Bayesian Optimisation and Machine Learning. Seonghyeok PARK	837
17:00	Accelerating the development of oxynitride coatings by 2-dimensional combinatorial magnetron sputtering approaches Stefanie FRICK	1346
17:15	Micro Probe System for Diverse In-Situ Applications Young Kil KIM	1231

POSTER SESSION 2 MP02

17:30	Novel cost-effective oxidation resistant SiC coating for graphite parts in semiconductor applications Chloé SEIMETZ	01_1006
17:30	Optimizing the Defect Density of Silicon Carbide by Finite Difference Time Domain Simulation Tsung-Yu HUANG	02_1063
17:30	Room Temperature Growth of MoTe ₂ for Ultrafast Broadband Photodetectors Vinit SHEOKAND	03_1189
17:30	Comparative Analysis of Transparent TiO ₂ Nanotube Thin Films on TCO coated Flexible and Glass Substrates Krunoslav JURAIC	04_1206
17:30	Control of Imprint and Capacitive Effect in Ferroelectric Heterostructures Chenyue HU	05_1345
17:30	Multisource magnetron sputtered elastic thin-film thermoelectric generator for harvesting waste heat from heat exchangers and heat flux measurement Ariel LEWANDOWSKI	06_1387
17:30	Room Temperature Growth of MoTe ₂ for Ultrafast Broadband Photodetectors Vinit SHEOKAND	07_1714
17:30	Barrier high-temperature non-metallic coatings on metals to prevent uncontrolled spreading of metallic solders during the manufacturing and operation of microelectronic and optical devices Tatyana STETSYUK	08_174

17:30	Growth of orthorhombic α -Ga ₂ O ₃ thin films on N-polar GaN by mist chemical vapor deposition Misaki NISHIKAWA	09_212
17:30	Mechanism of Atomic Layer Deposition of BaTiO ₃ with Metal β -diketonate and Ozone Precursors Ji LIU	10_290
17:30	Development of High-Purity Precursor Reference Materials for ALD-Deposited High-k Dielectric Thin Films in Advanced Semiconductor Devices Sangbeom LEE	11_375
17:30	A method for preparing Cu ₂ O-Pt composite thin films by combining PVD and liquid-phase deposition techniques Tsubasa KEMMIZAKI	12_378
17:30	Development of Inorganic Contaminants Analysis Method for Tracking Etching of Ceramic Components during Plasma Processes Minjin LEE	13_452
17:30	Suppression of Leakage Current in Low-Temperature ALD HfO ₂ Films via Oxidant Feeding Optimization Jeong Hwan KIM	14_534
17:30	Hydrophilic Surface Modification of Microfluidic Channel by Room Temperature PEALD SiO ₂ Technology Chien-Wei CHEN	15_778
17:30	Growth and study of Ta ₂ O ₅ thin films by radiofrequency magnetron sputtering Aimane CHEIKH	16_805
17:30	Understanding Thin Film Metallic Glass Forming Ability from Data-Driven Bayesian Optimization Xuliang LUO	17_889
17:30	Epitaxial Growth of α -Ga ₂ O ₃ Thin Films by RF Magnetron Sputtering for Power Devices Chang-Yong KIM	18_987

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

DEVICE AND HETEROSTRUCTURE FABRICATION

M09

14:00	Laser-Induced Forward Transfer of metallic compounds for flexible circuits manufacturing Sorin GRIGORESCU	1563
14:30	Liquid Metal-Assisted CVD Graphene Synthesis: Insights from Sn-In Binary Alloy Systems Maryam SAEED	724
14:30	Fabrication of high quality, large-area twisted TMD bi-layers Daniel CAPOLAT PALOMAR	1578
15:00	Defect engineering in single-layer graphene upon sputter deposition of thin metal films Franck Louba NADJI ADJIM	754
15:15	Morphological and Electrical Characterization of Thermally Evaporated Fluoride Thin Films for 2D-based Electronics Behzad DADASHNIA LEHI	1230
15:30	Coffee break	

DEVICE AND HETEROSTRUCTURE FABRICATION

M10

16:00	Low-Field Memristive Switching in Epitaxially Strained SnS Thin Film Michael ROHDE	249
16:30	Growth of orthorhombic $_{-(\text{In}_x\text{Ga}_{1-x})_2\text{O}_3}$ thin films on (111) 3C-SiC templates via mist chemical vapor deposition Masatoshi KOYAMA	171
16:45	Freestanding GaN thin films grown on graphene and amorphous carbon-coated c-sapphire for Flexible Electronic Devices Muhammad Sabbtain ABBAS	443
17:00	Strain evolution and in-situ phase transitions in freestanding BaTiO ₃ epitaxial membranes via La _{2/3} Sr _{1/3} MnO ₃ sacrificial layer Gurukrishna KELAYATHODI	423

18:00 YOUNG RESEARCHER AWARDS CEREMONY

18:30 SOCIAL EVENT



Symposium N

Sessions: Room 134 | Main Building

Poster Session: 237 (Small Hall) | Main Building

THIN FILM, FLEXIBLE AND COMPOSITE MATERIALS AND THEIR FORMATION TECHNIQUES

SYNTHESIS AND CHARACTERIZATION OF FUNCTIONAL NANOCOMPOSITE MATERIALS

Symposium organizers:

Gil GONCALVES

Katarzyna SIUZDAK

Raghvendra Singh YADAV
(Main Organizer)

– University of Aveiro

– Institute of Fluid-Flow Machinery
Polish Academy of Sciences

– Tomas Bata University in Zlin

Monday, 15 September 2025
OPTOELECTRONICS NANOMATERIALS I
N01

09:00	Eco-friendly preparation of emissive and photothermal ultrasmall gold-nanoclusters: effect of N- and S-ligand on optical properties. Salvatore PETRALIA	381
09:30	1789 Inkjet-Printed Graphene–Perovskite Photodetectors for UV–Visible Sensing Julia MARÍ-GUAITA	1789
09:45	Luminescent, Semiconductor Nanoparticle-Loaded Polymer Microbeads – Comparing Particle Architectures Lena SCHOLTZ	1217
10:00	Metal-Coated Carbon Nanotubes as optical filters for astrophysical application: a spectroscopic investigation. Luisa SCIORTINO	1767
10:15	Carbon Dot-Based Room Temperature Phosphorescent Materials with Tunable Emission via Polymer matrices Maruthapandi MOORTHY	1836
10:30	Coffee break	

OPTOELECTRONICS NANOMATERIALS II
N02

11:00	Structural phase transition for luminescence thermometry Lukasz MARCINIAK	141
11:30	Designing Hybrid BiOI Photocatalysts: Thin Films, Microstructures, and Nanofibers for Enhanced Water Treatment Laura HUIDOBRO RODRÍGUEZ	668
11:45	Multifunctional metal oxide membrane for simultaneous oil-water separation and contaminant degradation Santhra KRISHNAN P	623
12:00	Atomic Layer Deposited Titanium Oxynitride Interlayers to Tailor n-Si/NiOx Interfaces for Photoelectrochemical Applications Giorgia MALANO	520

12:15	Advancing Solar-Light Driven Photocatalysis and Antibacterial Control with NZAF/MXene Nanocomposite Anne MASIH	1615
12:30	Lunch	

ADVANCED NANOCOMPOSITES I

N03

14:00	Advanced Nanomaterials and Composites for Energy Harvesting and Hydrogen Generation Sanjay MATHUR	1657
14:30	Electrosprayed functional TiO ₂ -PMMA nanocomposites for photocatalytic water treatment Vincenzo Manuel MARZULLO	403
14:45	Laser synthesis of transition metal oxide nanoparticles for titania nanotube decoration as efficient water splitting catalyst Cristiano LO PO	602
15:00	Thermally Conductive and Electrically Insulating Nanocomposites for Battery Applications Anne COLOIGNER	240
15:15	Tunable Piezoelectric and Thermoelectric Properties of PVDF-co-TrFE-Based Polymer Composites Thibaut MOREL	67
15:30	Coffee break	

ADVANCED NANOCOMPOSITES I

N04

16:00	Scalable Fabrication of High-Performance CNT-Based Composites Using Tailored Polyimide Bon-Cheol KU	425
16:45	Tuning Thermoresponsive Nanoparticle Assembly at Interfaces: The Surprising Role of Ionic Strength Rafal ZBONIKOWSKI	1192

- | | | |
|-------|--|------|
| 17:00 | <p>Al-Doped ZnO-Based Nanostructures for Transparent Electrochemical Capacitors as an Energy Storage Device and Temperature Sensor in Smart Building Applications</p> <p>Febin PAUL</p> | 1356 |
| 17:15 | <p>Facet-Engineered Multicomponent High-Entropy Nanocrystals: CO-Mediated Synthesis and Electrocatalytic Applications</p> <p>Chia-Ying WU</p> | 856 |

POSTER SESSION 1 NP01

- | | | |
|-------|--|---------|
| 17:30 | <p>Reverse Pilloti-Inspired Evaporator for Enhanced Interfacial Evaporation and Salt Rejection in Sustainable Water Purification</p> <p>Dong Geon LEE</p> | 01_1010 |
| 17:30 | <p>Self-Cleaning Underwater Anti-Oil-Fouling Filters with Partially Dissoluble Surfaces for Enhanced Interfacial Oil/Water Separation</p> <p>Eun Jin KIM</p> | 02_1012 |
| 17:30 | <p>Precisely Engineered Alginate Capsules via a Facile Strategy for Advanced Multifunctional Applications</p> <p>Seung Hee HAN</p> | 03_1051 |
| 17:30 | <p>Reverse Engineering and Crystallographic Analysis of Metal-Oxide-Semiconductor Field-Effect Transistors using Electron Microscopy</p> <p>Lee JU HO</p> | 04_106 |
| 17:30 | <p>Enhancement of Ferroelectric and Memory Performance of P(VDF-TrFE) based FeFET by MAPbI₃ composites</p> <p>Hyeonje KIM</p> | 05_1110 |
| 17:30 | <p>Zn nanoparticles and Cu nanowires epoxy composites and hydrogels: EMI shielding performance and dielectric properties investigation.</p> <p>Dzmitry TSYHANOK</p> | 06_1188 |
| 17:30 | <p>Eco-Friendly Nanoparticles for Rapid Cardiac Biomarker Testing</p> <p>Carmen Marinela MIHAILESCU</p> | 07_1201 |
| 17:30 | <p>Electrochemical synthesis and characterization of a Polyaniline-Azulene nanocomposite film for formaldehyde sensing applications</p> <p>Mihaela SAVIN</p> | 08_1222 |
| 17:30 | <p>Tailored ZIF-8 Growth on Silicon and Optical Fibers: Linking Morphology, Refractive Index, and Gas Sensing Performance.</p> <p>Artur Tadeusz SAMP</p> | 09_1272 |

17:30	Design of Experiments for the Optimization of PNVCL Fiber Fabrication via Electrospinning and Solution Blow Spinning Techniques Maria Antônia Rodrigues DE PAULO	10_1348
17:30	Composite polymeric Bragg reflector membranes for optical vapor sensing Pola PAWLIKOWSKA	11_1361
17:30	High-temperature synthesis of nanostructured aluminum diboride coatings in halide-oxide melts Tatyana STETSYUK	12_147
17:30	Synthesis of nanostructured powders and coatings of chromium silicides by currentless diffusion saturation and metallothermal reduction methods Tatyana STETSYUK	13_149
17:30	Synthesis and Characterization of 2D Graphite/Carbon Dot Films via Scalable Flexographic Printing for Non-Faradaic Electrochemical Quantification of IL-8 Abdulaziz ASSAIFAN	14_198
17:30	Field_effect transistor based on reduced graphene oxide film with ZnO and porous silicon absorbers for ionizing radiation detection Igor OLENYCH	15_210
17:30	Vibration damping performance of carbon nanotubes-embedded rubber composites Jaehan LEE	16_282
17:30	Hybrid nanostructures of carbon nanotubes and CdTe nanoparticles Nataliia KURGAN	17_292
17:30	Non-covalent interactions between carbon nanotubes and rare-earth bisphthalocyanines Lina M. BOLIVAR PINEDA	18_305
17:30	Construction of MoS2 Nanosheets/Hydrogenated Graphene Hybrid Catalysts for Highly Efficient Electrocatalytic Hydrogen Evolution Xiuxiu HAN	19_332
17:30	Facile Engineering of Transparent TiO2 Nanotube Electrodes with Metal Sulfides for Efficient Water Splitting Katarzyna SIUZDAK	20_354
17:30	Precisely Engineered Alginate Capsules via a Facile Strategy for Advanced Multifunctional Applications Seung Hee HAN	21_368

17:30	Pre-Compression-assisted Approach to Wavy Networks of Metal Nanowires Imparting Omnidirectional Stretchability and Transparency Sang-Soo LEE	22_37
17:30	Understanding the FC-CVD process for the synthesis of carbon nanotubes Lukasz NOWICKI	23_419
17:30	Tailoring Thermoelectric Properties of Solution-Processed SnSe ₂ Thin Films through ZnO Nanoparticle Incorporation Roupen VARTIAN	24_434
17:30	Quantum dot based luminescent signage with enhanced thermal management using bio-inspired nanocomposites Min-Sang LEE	25_451
17:30	Power Dependent Tunable Optical Nonlinearity in Iron oxide/Borophene Core-Shell Nanoparticles Under Ultrashort Laser Excitation Akanksha PANDEY	26_476
17:30	Engineered silica-hybrid aerogel particles for advanced thermal insulation Jeong-Gu YEO	27_507
17:30	Development of a laboratory X-ray microscope for investigating the setting and hardening process of refractories by full-field imaging, STXM and XRF Heinrich TOST	28_535
17:30	Development of Zinc Stannate based Antibacterial and UV-protective Thermoplastic Polyurethane Nanocomposites: A Sustainable Solution for Medical Inflatables Applications Bharti RANA	29_558
17:30	Polymer fluidic gates with physicochemically tunable wetting properties and their applications to reconfigurable liquid manipulation Sehwan SONG	30_607
17:30	Investigation of Pt, Ru, and Pd Catalysts Supported on Alumina Synthesized by Spray Pyrolysis for MBT Hydrogenation Toan Minh PHAM	31_608
17:30	Computational approaches to the investigation of responsive nanomicelles for drug delivery Dario ORLIC	32_631
17:30	Electrospun BiOI/SnO ₂ Nanofibers for Efficient Photocatalytic Water Treatment Laura HUIDOBRO RODRÍGUEZ	33_672
17:30	Visible Light Photocatalytic Degradation of Rodamin B Using Ti ₃ C ₂ T _x MXene Film Halime AK	34_71

17:30	Structural Properties of HMTP Organic Semiconductor Thin Films on Epitaxial Graphene vs. Bare 6H-SiC(0001) at Elevated Temperatures Devanshu VARSHNEY	35_720
17:30	Enhanced IR Emissivity of Functionalized PVDF-Based Electrospun Nanofibers Incorporating SrTiO ₃ Nanoparticles Muhammad Usman MUNIR	36_761
17:30	Pulsed laser deposition of bulk-like (111)- and (001)- NiO thin films Simranjeet KAUR	37_842
17:30	Surface Functionalization of Ti ₃ C ₂ T _x MXenes in Epoxy Nanocomposites: Enhancing Conductivity, EMI Shielding, Thermal Conductivity, and Mechanical Strength Syed Muhammad Shabbir Madad NAQVI	38_887
17:30	Plasma-Assisted Nanoengineering: Tailoring Surfaces and Nanomaterials via DBD-Driven Laser Ablation Nazim ASLAM	39_890
17:30	Extreme Ultra-violet Metal Oxide Resist Synthesis as Hard Mask for Nano Structure Fabrication Janghyun JU	40_936
17:30	Biodegradability Assessment of Biodegradable Plastics in Various Environments Hye Kyeong SUNG	41_942
17:30	Metal-Organic Frameworks Derived Transition Metal Nitride/Carbon Composite as Anodes for Lithium-Ion Batteries Seong Ho JUNG	42_957
17:30	Silicon-Embedded Hollow Transition Metal Oxide/Graphitic Carbon Composite Microspheres via a Scalable Process as Anodes for Lithium-Ion Batteries Beom Su JO	43_958
17:30	Localized MoS ₂ Conversion and Crystallinity Enhancement via Laser Parameter Control Naryeong HONG	44_971
17:30	Thermoresponsive MBGNs@PNVCL Nanoparticles for Biomedical Applications Arthur GABRIEL	45_98
17:30	Stretchable Conductive Nanocomposites for Washable Textile Electronics via Control of Intermolecular Interactions: Experiment and Simulation Heesuk KIM	46_986

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|-------|--|--------|
| 17:30 | Effect of Water Sorption on the Mechanical Properties of Direct and CAD/CAM Subtractive Dental Resin Composites
Georgiana OSICEANU | 48_990 |
| 17:30 | Magnetic Amino-Functionalized COF Nanocomposite: From Material Design to Toxic Dye Removal Application
Khin Moe LWIN | 49_991 |
| 17:30 | Interfacial energy transfer and emission tunability via spatial control of sensitizer in core@shell@shell upconverting nanophosphors
Cinumon K. V. | 50_999 |

Tuesday, 16 September 2025

NANOMATERIALS FOR HEALTHCARE I

N05

- | | | |
|-------|--|------|
| 09:30 | Nanomaterials for Antimicrobial and Antiviral Applications: From Surface Engineering to Selective Biocontrol
Jan PACZESNY | 1268 |
| 09:45 | Advancing Diabetic Wound Healing with Nanomaterials: Harnessing the Regenerative Power of Zinc Oxide, Silver, and Cerium Oxide Nanoparticles
Aneela ANWAR | 1633 |
| 10:00 | Sol-gel derived boron–aluminum–silicon oxide thin films with enhanced antibacterial properties: A comprehensive characterization study
Gökhan Gurur GÖKMEN | 1673 |
| 10:15 | Self- assembled functional hybrid nanomaterials composed of metal nanoparticles and cyclodextrins for biomedical applications
Mariachiara TRAPANI | 792 |
| 10:30 | Coffee break | |

NANOMATERIALS FOR HEALTHCARE II

N06

- | | | |
|-------|--|------|
| 11:00 | Chemical, morphological and functional characterization of surface modified silicon carbide (SiC) substrates
Maria Elena FRAGALA | 243 |
| 11:30 | Engineering nanoparticles-based and polymer-based anti-phage materials
Bartłomiej BONCZAK | 1393 |

11:45	Tailored PDMS Nanocomposite Thin Films via RSM-Guided Fabrication for Light-Guided Biomedical Applications Dorna ESRAFILZADEH	578
12:00	Investigating the Effect of Morphological and Structural Parameters for Antibacterial Efficacy of Zinc Stannate-based Thermoplastic Polyurethane nanocomposites Bharti RANA	553
12:15	From Natural Dyes to Engineered Nanoparticles: Selective Inactivation of Bacteriophages Using Functional Materials Sada RAZA	472
12:30	Lunch	

HYBRID NANOMATERIALS I

N07

14:00	Modified 2D Transition Metal Dichalcogenide Flakes for Sensing Applications Mahesh KUMAR	41
14:30	Enhanced CO2 adsorption through triethylenetetramine functionalized Cu-grown carbon nanomatrices supported on porous activated carbon fiber: Experimental investigations, Isotherm, and RSM modelling Bhaskar BHADURI	70
14:45	Colloidally Stable Electroactive Polypyrrole Nanoparticles for Electrocatalysis and Sensing Piyush Sindhu SHARMA	696
15:00	Tailoring CoFe ₂ O ₄ - BiFeO ₃ 0-3 nanocomposite thin films by chemical solution processing for energy harvesting Karla MENA AGUILAR	
15:15	Optical spectroscopic investigations of the layer-dependant electronic and thermal properties of two-dimensional MoSe ₂ Shyama RATH	1329
15:30	Coffee break	

HYBRID NANOMATERIALS II

N08

16:00	Composite electrodes for electrochemical actuators with augmented functionalities Pooi See LEE	818
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16:30	Metal Halide Perovskites for Gas Sensing Applications Georgios LANDROU	1444
16:45	Laser Synthesis of Colloids: Mechanisms of Formation, Tailored Properties, and Emerging Applications of Composite Nanoparticles Zaneta SWIATKOWSKA-WARKOCKA	1569
17:00	Fabrication and Evaluation of Biodegradable Biphasic Nanocomposite Scaffold for Osteochondral Regeneration Aneela ANWAR	1634
17:15	Thermal Degradation Kinetic Analysis of Hybrid Tetrapod Nanomaterial Energised Phase Change Material: Kalidasan BALASUBRAMANIAN	1709

POSTER SESSION 2 NP02

17:30	Ti-Cu-O photocatalytic thin films deposited via AA-MOCVD for marine antifouling applications Sara GHAZI	01_1004
17:30	Biodegradable Implantable Lignin-base Electrospun Patch for Hernia Repair Elaheh YOUSEFIMIAB	03_1182
17:30	Multimodal Visible-Infrared Subwavelength Structures with Decoupled Modulation of Reflection Spectra Yitong ZHOU	04_122
17:30	Alternative route for the preparation of Al ₂ O ₃ , AlON and AlN NPs for optical applications Maria ROJAS	05_1254
17:30	Enhancement of Thermal Management in Polymer Composites for Next-Generation Electronics Kardelen YILDIZ	06_1392
17:30	On-Site Performance Assessment of Composite Silica-Based Magnetic Aerogels for the Mitigation of POPs Alexandru Mihai GRUMEZESCU	07_1410
17:30	Biological evaluation of a newly developed aerogel-based nanocomposite for water decontamination applications Adelina-Gabriela NICULESCU	08_1413

17:30	Magnetic Aerogel-based Nanocomposites for Pesticide Removal – On-Chip Synthesis Optimization Elena-Theodora MOLDOVEANU	09_1415
17:30	Laboratory-Scale Evaluation of Silica-Based Magnetic Aerogels for Pesticide Removal from Contaminated Water Alexandra Catalina BIRCA	10_1421
17:30	Development of a Multichannel Microfluidic Solid Phase Extraction Device for On-Site Sampling Dan Eduard MIHAIESCU	11_1435
17:30	Synthesis and optimization of nanocomposite-modified melamine foam for force sensors Yang XUE	12_1480
17:30	Ionic liquid based nanocarrier for oral co-delivery of JAK2 inhibitors for Inflammatory bowel disease treatment Raj KUMAR	14_1514
17:30	Surface-Engineered P(VDF-TrFE)-BTO Composites for Efficient Energy Harvesting Applications Kristine O'DWYER	15_1517
17:30	Effect of dopant on particle growth of the thermal stability of core-shell ferrite nanoparticles Urszula KLEKOTKA	16_1542
17:30	Structure-guided Modulation of Optical and Mechanical Properties in Ultrathin Poly(L-benzyl-L-glutamate)-based Membranes Mourad SOUIBGUI	17_1551
17:30	Electronic Structure and Surface Passivation of Perovskite Thin Films Investigated by Ultraviolet Photoelectron Spectroscopy (UPS) Ratchadaporn SUPRUANGNET	18_1568
17:30	Imaging of Buried Interfaces in Mixed-Dimensional Heterostructures Using Raman Spectroscopy Artur DOBROWOLSKI	19_1581
17:30	Advanced magnetic nanoparticle for hyperthermia: A review Yadvendra SINGH	20_1629
17:30	Development Potential of ZnO Tetrapod-Embedded Electrospun Nanofibers for Antimicrobial Food Packaging Sahar AKHAVAN-MAHDAVI	21_1642

17:30	Morphological and chemical characterization of microcapsules containing dicyclopentadiene for use in self-healing materials Malgorzata GOLONKA	22_1644
17:30	Biological transistor (bioFET) for the specific and label-free sensing of CRP in unprocessed blood Shubham BABBAR	23_1669
17:30	Development of lightweight and high heat dissipating bio-inspired composites for printed circuit board with thermal conductivity of 30 W/mK Kwang-Yeol LEE	24_1676
17:30	Flower-like ZnO decorated with aluminum nanoparticles as a UV active nanocomposites Violeta DEDIU	25_1712
17:30	Tetrapods-Chitosan Composites for Food and Healthcare Technologies Hira ABDULLAH	27_1799
17:30	Dual-Functional Coupling Agent for CF/EP Composites: Comparative Study of Carbonaceous Nanofillers with Zwitterionic Silane Modification for Enhancing CF/EP Mechanical Performance Mariam OMAR	28_180
17:30	Advancing Green Construction: Development and Characterization of Fiber board from Date Palm Waste Tarique JAMAL	29_26
17:30	Multiscale Biodegradable Polymer Strategy for Synergistic Enhancement of Interlaminar Shear Strength, Fracture Toughness in High-Performance CF/EP Composites Mariam OMAR	30_308
17:30	Irreversible Lattice Expansion Effects in Nanoscale Indium Oxide for CO2 Hydrogenation Catalysis Mengsha LI	31_395
17:30	Green Synthesis and Functional Integration of Silver Nanoparticles into Cellulose Membranes for Antibacterial Applications Gulnaz ASHRAF	33_418
17:30	Exploring Superparamagnetism in PLAL-Synthesized High-Entropy Oxide Nanocrystals Tsung-Yu HSIAO	34_435
17:30	Smart functional composite scaffolds for extracellular pH-sensing in in vitro models Valentina ONESTO	36_562

17:30	Enhanced Stability of PbS Quantum Dot Solar Cells Using Novel Molecular Hole Transport Layers Wei ZHOU	37_640
17:30	Development of Lightweight and Cu-CNT Hybrid Conductors with Enhanced Electrical Performance Hyeonseong KIM	38_643
17:30	Development of novel carbon nanotube hydrogels using tannic acid Nobuyasu OKUBO	39_745
17:30	Multimodal In Vivo Cell Tracking Enabled by Gold Nanoparticle-Loaded Capsules Sneha SINGH	40_779
17:30	Dual Surface Functionalized PDMS Nanoplatforms for Enhanced siRNA Loading and Targeted BCL-2 Gene Silencing in Breast Cancer Cells Sneha SINGH	41_780
17:30	Fabrication of Large-Scale Single-Crystal Copper Foils with Atomic-Scale Flatness via Muscovite-Assisted Method Tzu-Ming CHAN	42_849
17:30	Speckle-based analysis of reconfigurable polymer dispersed liquid crystals for cryptographic applications Serena SALVESTRINI	43_911
17:30	Unveiling a Scalable Pathway to High-Performance Perovskite Nanoparticle Assemblies for Next-Generation Optoelectronics Karthika VIJAYAN	44_997

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

SMART NANOCOMPOSITES I

N09

14:00	Quantifying Functional Groups and Coatings on Nanoobjects Ute RESCH-GENGER	1437
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14:30	Construction of MoS ₂ Nanosheets/Hydrogenated Graphene Hybrid Catalysts for Highly Efficient Electrocatalytic Hydrogen Evolution Xiuxiu HAN	331
14:45	Origin of the Double Polarization Mechanism in Aluminum-Oxide passivated Quasi-free-standing Epitaxial Graphene on 6H-SiC(0001) Karolina PIETAK-JURCZAK	572
15:00	Green Synthesis and Characterization of Functional Al ₂ O ₃ /KH550-Modified Bamboo Nanocomposites for High-Performance Structural Applications Ziyu BA	692
15:15	Hybrid tetrapod nanomaterial engineered organic phase change material Adarsh Kumar PANDEY	1708
15:30	Coffee break	

SMART NANOCOMPOSITES II N10

16:00	Tetrapods based Smart Composite Materials for Advanced Technologies Yogendra MISHRA	1759
16:30	Fabrication of interconnected hierarchical porous Lithium Sodium Potassium Niobate piezoceramics via field-assisted sintering for bone regeneration Abdullah RIAZ	132
16:45	Rapid synthesis of MAX phase by combining induction heating and self-propagating high-temperature synthesis for MXene applications Mitsuru INADA	934
17:00	Influence of thickness, composition, and light intensity on the photo-switching behavior of diarylethene-embedded polymer thin films Nina POPOV	1045
17:15	Reliable Measurements of the Photoluminescence Quantum Yield of Transparent and Scattering Luminophores Ute RESCH-GENGER	1451
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

NANOCOMPOSITES-MINI TALKS I

N11

09:00	From layered to spherical: Electrochemical transformation of MXenes structure for enhanced water splitting Katarzyna SIUZDAK	347
09:20	Illuminating Antimicrobial Defense: Quantum Dot Hydroxyapatite Nanoparticles with Light Sensitivity and Antimicrobial Properties Bartosz KAMINSKI	1103
09:30	Synthesis and Characterization of Fe ₃ O ₄ Nanoparticle-Reinforced Densified Bamboo for Fire- and Water-Resistant Functional Applications Jie CUI	170
09:40	Cost-efficient synthesis of porous TiO ₂ , Ta ₂ O ₅ and TiO ₂ -Ta ₂ O ₅ nanocomposite films and their comparative study for biomedical applications Sarmistha BHATTACHARJEE	1181
09:50	Production of polymer membranes via phase inversion method and investigation of separation properties Asif JAMIL	144
10:00	Fabrication of Multifunctional 3D Continuously Porous Conducting Polymers and Their Nanocomposites for Flexible Dual Hydrogen and Ammonia Gas Sensor Guldana ZHIGERBAYEVA	1062
10:10	Eco-friendly Recycling System Using Solvent-impregnated Nano-porous Filter for Neodymium Ion Extraction and Separation Dongmin SHIN	970
10:20	Design of Anisotropic Silica Nanoparticles for Advanced Materials Francesco PIRAINO	1763
10:30	Coffee break	

NANOCOMPOSITES-MINI TALKS II

N12

11:00	Electromagnetic Interference Shielding/Microwave Absorption in Advanced Nanocomposites Raghvendra Singh YADAV	1601
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11:20	Sustainable Metal-Polyphenol Nanocomposite Coating for Enhancing Fouling Resistance of Ultrafiltration Membranes Khin Moe LWIN	962
11:30	Fabrication of Multifunctional 3D Continuously Porous Conducting Polymers and Their Nanocomposites for Flexible Dual Hydrogen and Ammonia Gas Sensor Guldana ZHIGERBAYEVA	1054
11:40	High-Performance Zinc Stannate-Thermoplastic Polyurethane Multifunctional Nanocomposites for Inflatable Applications Bharti RANA	556
11:50	Debatable van der Waals epitaxy of sputter deposited scandium nitride on fluorophlogopite mica Susmita CHOWDHURY	759
12:00	Highly Sensitive Temperature Probing with Er ³⁺ -doped GdOF Nanoparticles: From Synthesis to Luminescence-Based Thermometry Federica SCARDACI	783
12:10	Energy Harvesting from Polymer/Biowaste/MoS ₂ Composites Satyasadhan DOWARAH	1822
12:20	Piezoelectric PVDF Nanoparticles for Enhanced Antimicrobial Activity via Mechanical Stimulation: A Proof-of-Concept Study Mariana FERNANDES	1384
12:30	Lunch	

NANOCOMPOSITES-MINI TALKS III

N13

14:00	Liquid gallium polymorphic diamond growth under the guidance of machine learning Marco PERES	303
14:20	Water-soluble CaO sacrificial layer heteroepitaxially grown on yttria-stabilized zirconia and r-plane sapphire substrates for large ferroelectric BaTiO ₃ sheets Weikun ZHOU	350
14:30	Design and Optimization of Electrospun PCL/Chitosan/nHAp Nanofibrous Scaffolds for Bone Tissue Engineering Applications Using Statistical Experimental Design Sara SAFAKHAH	1160

14:40	Doped hydroxyapatite nanoparticles and its impregnation on fabric for the effective uptake of Pb and Cd from wastewater Yashvi SHETH	888
14:50	Synthesis of Sr _{0.5} La _{0.5} Fe ₁₂ O ₁₉ /Ti ₃ C ₂ -MXene composite as a promising electrode material for supercapacitor applications Vidhi .	1616
15:00	Enhanced Heat Dissipation and Antibacterial Behaviour of Superhydrophobic Silver Nano Shell and Carbon Nano Tubes Reinforced PDMS Coating Ashish KUMAR	322
15:10	Wear, corrosion, and biocompatibility assessment of TiO _x , TaO _x , and TiO _x -TaO _x coatings on Ti-6Al-4V biomedical Implants. Kartikey CHATURVEDI	865
15:20	Electroactive Coatings on Laser-Textured Titanium-based substrates for an improved Antibacterial Activity Pedro SILVA	1366
10:30	Coffee break	

NANOCOMPOSITES-MINI TALKS IV & BEST ORAL & POSTER PRESENTATION AWARDS

N14

16:00	Enhancing Corrosion Resistance through the Formation of Core-Shell Structure on AZ91D Magnesium Alloy via Plasma Electrolytic Oxidation Cheng-Sao CHEN	1175
16:20	Antimicrobial, Superhydrophobic, and Highly Transparent Nanocoatings for Glass Deepika SINGH	1621
16:50	Molecular Dynamics Simulation study on deformation mechanism of Bombyx mori silk and Hydroxyapatite under mechanical loading Gopal Nandan TIWARI	979
17:00	Electrodeposition of Cu-SWCNT Composite Films with Enhanced Electrical and Thermal Properties Juno LEE	605



Symposium O

Sessions: Room 308 | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

TOPOLOGICAL TEXTURES IN ANTIFERROIC AND FERROIC MATERIALS

Symposium organizers:

Céline **LICHTENSTEIGER**

– Université de Genève

Jean-Yves **CHAULEAU**
(Main Organizer)

– SPEC, CEA Saclay

Marta **GIBERT**

– TU Wien

Vincent **GARCIA**

– Laboratoire Albert Fert

Tuesday, 16 September 2025

SESSION 5

O05

09:00	Domain walls in multiferroics and multiferroic domain walls Manfred FIEBIG	1597
09:30	Distribution of antiferromagnetic rare-earth domains in multiferroic Dy _{0.7} Tb _{0.3} FeO ₃ Mads WEBER	1498
09:45	Probing theTHz dynamics of single domain multiferroic BiFeO ₃ Stephane FUSIL	1745
10:00	Nanoscale electrostatic control in ferroelectric thin films through lattice chemistry Morgan TRASSIN	1879
10:30	Coffee break	

SESSION 6

O06

11:00	Antiferroelectricity and Ferrielectricity in PbZrO ₃ and PbHfO ₃ Thin Films Nazanin BASSIRI-GHARB	897
11:30	Antiferroelectrics: we love them, but what's next? Cosme MILESI-BRAULT	1823
11:45	Atomistic simulations in PbZrO ₃ and Zr-rich Pb(Zr,Ti)O ₃ Marek PASCIAK	1797
12:00	Be in the loop with antiferroelectrics Brahim DKHIL	1791
12:15	Polar Order in Soft Matter: Ferroelectric and Antiferroelectric Smectic Phases Katarzyna KWIATKOWSKA	1768

12:30 Lunch

SESSION 7

O07

- | | | |
|-------|---|------|
| 14:00 | Whirling polar textures in nanostructures and superlattices of BaTiO ₃ on silicon
Catherine DUBOURDIEU | 1713 |
| 14:30 | Exfoliation of PbTiO ₃ /SrTiO ₃ Artificial Superlattice Films using Sacrificial Layers
Kohei TAKAHASHI | 604 |
| 14:45 | Photogalvanic shift currents in BiFeO ₃ -LaFeO ₃ superlattices
Francesco DELODOVICI | 1773 |
| 15:00 | Unveiling Polar Architectures in BiFeO ₃ Superlattices via Scanning Transmission Electron Microscopy
Razvan BURCEA | 1750 |
| 15:15 | Dielectric behavior in multidomain ferroelectric/dielectric BaTiO ₃ /SrTiO ₃ superlattices
Lei YIN | 568 |
| 15:30 | Coffee break | |

SESSION 8

O08

- | | | |
|-------|---|------|
| 16:00 | Ferroelectric Switching in BiFeO ₃ : From Ab-initio Mechanisms to Machine-Learned Models for Sustainable Electronics
Inigo ROBREDO-MAGRO | 1016 |
| 16:30 | Unsupervised Machine Learning Phase Diagram Construction for a 2D Effective Model of PbZrO ₃
Pavel BALÁŽ | 1778 |
| 16:45 | Ferroelectric antiskyrmions in barium titanate.
Jiri HLINKA | 1780 |
| 17:00 | From homogeneous phases to inhomogeneous polar textures in ferroelectric perovskites and related compounds: a theoretical perspective
Philippe GHOSEZ | 786 |

Wednesday, 17 September 2025

9:00

PLENARY SESSION

12:30

Lunch

		SESSION 9	O09
14:00	Domain walls, skyrmions and vortices probed with scanning NV microscopy Aurore FINCO		1111
14:15	Antiferromagnetic solitons in NiO as possible entities for logic operations Michel VIRET		1654
14:30	Investigation of domain wall properties in Cr2O3 Paulina J. PRUSIK		265
15:00	Self-induced Floquet magnons in magnetic vortices Joo Von KIM		1167
15:30	Coffee break		

		SESSION 10	O10
16:00	Bi ₂ O ₃ -based control of polarization and polar chirality in BiFeO ₃ Elzbieta GRADAUSKAITE		1477
16:30	Dynamical Manipulation of Polar Topologies from Acoustic Phonon Excitations Louis BASTOGNE		1321
16:45	Defect-Driven Polar Topologies in Room-Temperature Layered Multiferroic Thin Films Lynette KEENEY		400

17:15	3D Insight into Polar Topological Textures Salia CHERIFI-HERTEL	1586
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

SESSION 11 O11

09:00	Compressively strained SrTiO ₃ Pavlo ZUBKO	1880
09:30	Complex Dipolar Structure in the Interface of Bonded Lithium Niobate Crystals Kristina HOLSGROVE	1169
09:45	2D hybrid molecular ferroelectrics with switchable ferroelectricity and photoelectric robustness down to monolayer Yuzhong HU	536
10:00	Unexpected competition between polar displacements and Rashba phenomena in strained SrTiO ₂ Julien VARIGNON	473
10:30	Coffee break	

SESSION 12 O12

11:00	Chirality: a new degree of freedom for skyrmionics H��lene B��A	1878
11:30	New Insights on the Response and Fine Control of Complex Polar Textures under External Stimuli Fernando G��MEZ-ORTIZ	81

12:00	Influence of ferroic domain walls on thermal conductivity Guillaume NATAF	299
12:30	Lunch	

		SESSION 13	O13
14:00	Unusual domain walls in hyper- and antiferroelectric oxides Dennis MEIER		482
14:30	Domains, superdomains and ripples in epitaxially strained and freestanding PbTiO3 Céline LICHTENSTEIGER		1323
14:45	Non-reciprocal neutral ferroelectric domain walls in BiFeO ₃ Mauro António PEREIRA GONÇALVES		1810
15:00	Probing the Emergent Phases in Ferroic Domain Walls Shelly CONROY		1881
15:30	Coffee break		



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Symposium P

Sessions: Room 412 | Main Building

Poster Session: 237 (Small Hall) | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

2D MATERIALS FOR MAGNETISM AND SPINTRONICS: FROM FUNDAMENTALS TO INTEGRATED TECHNOLOGY

Symposium organizers:

Bruno DLUBAK
(Main Organizer)

Hiroshi NAGANUMA

Stephan HOFMANN

- Laboratoire Albert Fert CNRS-Thales
- Tohoku University
- University of Cambridge

Monday, 15 September 2025

SESSION A

P02

11:00	Spin on 2D Quantum Matter Saroj DASH	1577
11:30	Epitaxial van der Waals materials for magnetism and spin-charge conversion Frédéric BONELL	1052
12:00	TMD and 2D ferromagnet Engineering of 2D-Magnetic Tunnel Junctions From Barriers to Electrodes by Pulse Laser Deposition Jane DANIEL	1479
12:15	Unveiling the Magnetic and Optical Landscapes of Novel MXenes: An Ab Initio Approach Jiri KALMAR	1001
12:30	Lunch	

SESSION B

P03

14:00	Controlling Magneto-Optics and Ultrafast Magnetization Dynamics in 2D Magnetic Materials Marcos H.D. GUIMARAES	670
14:30	From Theory to Device: Bridging First-Principles Modeling and Spin-Transport Experiments in 2D Heterostructures Simon M.-M. DUBOIS	1604
15:00	Efficient Spin Absorption and Spin-to-Charge Conversion in MBE-Grown 2D-MoTe2 Probed by Spintronic THz Spectroscopy Pinki YADAV	752
15:15	A versatile on-chip spintronics platform for stacked van der Waals heterostructures: exploring magnetization dynamics and spin injection for Cobalt proximitized by exfoliated 2D materials Francois MALLET	1573
15:30	Coffee break	

SESSION C

P04

16:00	Probing material interfaces with soft x-rays: Developing a standardized framework for depth-resolved x-ray absorption spectroscopy Masako SUZUKI-SAKAMAKI	774
16:30	2D material/Heusler compound van der Waals heterostructures for spintronic applications Sakai SEIJI	448
17:00	Large-Area Epitaxial 1T-TaSe_ Monolayers on Semiconducting Substrates for Room-Temperature Mottronics Pascale DIENER	1290
17:15	Competing Quantum Orders in 6R-TaS_2: Unconventional Superconductivity, Charge Order, and an Anomalous Hall Effect phase Orion GERGURI	183

Tuesday, 16 September 2025

SESSION D

P05

09:00	MBE-grown 2D ferromagnetic and altermagnetic materials Athanasios DIMOULAS	876
09:30	Rectification in two-dimensional spintronics systems Witold SKOWRONSKI	427
10:0	presentation of ENSEMBLE3 Kingshuk BANDOPADHYAY	
10:15	Exploring interface-driven phenomena in a 2D van der Waals antiferromagnetic material Bogdana BORCA	481
10:30	Coffee break	

SESSION E

P06

11:00	2D Spintronics: From Spinterface to Band Engineering of VDW Heterostructures Pierre SENEOR	1407
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11:30	First-principles study of heterointerfaces between 2D materials and iron-based magnetic alloys for spintronics applications Mitsuharu UEMOTO	800
12:00	Ferromagnetic van der Waals contacts for spin injection Yan WANG	869
12:30	Lunch	

SESSION F

P07

14:00	Symphony of Engineered Materials: Tailored Platforms for Photonics and Emerging Technologies Kingshuk BANDOPADHYAY	
14:30	Excitonic response in TMD heterostructures from first-principles: impact of stacking, twisting, and interlayer distance Riccardo REHO	107
15:00	Spin polarized dichalcogenide alloy for selective adsorption of gases Ahmad AYESH	220
15:15	Pulsed laser crystallisation of sputtered MoS2: role of synthesis conditions in determining film properties Alessandro TONON	836
15:30	Coffee break	

SESSION G

P08

16:00	Spin current generation in triple domain structured antiferromagnetic RuO2 for energy efficient SOT-MRAM Thi Van Anh NGUYEN	1156
17:00	Giant Enhancement in the Spin-orbit torque of Pt/Co bilayer system with high- κ dielectric dusting at the interface Shubham BHATT	1039

POSTER SESSION 2

PP02

17:30	2D Ferroelectrics for Magnetic Tunnel Junctions Samuel VERGARA	01_1108
17:30	A scalable approach towards the fabrication of MoS2 devices through standard semiconductor processing Daniele DEMENEGHI	02_1114
17:30	Growth and characterization of the two-dimensional electron gas at NiFe2O4/AlOx/SrTiO3 heterointerfaces for spin-charge conversion through the inverse Edelstein effect Amit CHANDA	03_1128
17:30	Toward Strain-Controlled Spin Logic: Interfacial Rashba States in Topological Insulator/Two-Dimensional Materials Heterostructures Pei-Yu CHUANG	04_124
17:30	Understanding the missing superconductivity in La0.77Ca0.23NiO2 infinite layer Aimane CHEIKH	05_1340
17:30	Direct CVD Graphene integration for Spintronics Jérémy PERRIN	06_1470
17:30	Chiral multiferroicity in two-dimensional hybrid organic-inorganic perovskites Haining ZHENG	07_1533
17:30	DFT analysis on electronic structure of graphene based magnetic tunnel junctions Matsumoto NAOHIRO	08_1534
17:30	ALD processes for 2D based spintronics Florian GODEL	09_485
17:30	Charge density waves in metallic/insulating phases of monolayer TaSe2/GaP Robin SALVATORE	10_654
17:30	Magnon-mediated perpendicular magnetization switching by topological crystalline insulator SnTe with high spin Hall conductivity Jiamin LAI	11_824

17:30	Atomic Force Microscopy grain size analysis in MoS2 thin films: quantitative comparison for different synthesis methods Alessandro TONON	12_848
17:30	Unveiling Half-Metallicity and Valley Polarization in Transition Metal-Substituted WSTe Monolayer Shivani KUMAWAT	13_86

Wednesday, 17 September 2025

9:00	PLENARY SESSION
12:30	Lunch

SESSION H

P09

14:00	Topological Spin Structures & Spin-Orbitronics in 2D: from van der Waals systems to multilayers Mathias KLÄUI	242
14:30	Properties modulation at the 2D and interface limit: from 2D materials to spintronic devices Marta GALBIATI	205
15:00	Towards switchable magnetic tunnel junctions based on 2D polyoxometalates monolayer Emma AOUSTIN	287
15:15	Curie Temperature in cobalt doped GaN Half metal Ferromagnet : Heisenberg model and GGA Study Mohamed BAIBOUD	83
10:30	Coffee break	

SESSION I

P10

16:00	Spin transport through Graphene/molecules-based magnetic tunnel junctions Pascal MARTIN	1140
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16:30	Gate-tunable in-plane spin lifetime anisotropy via proximity-induced spin-orbit coupling in low-symmetry graphene-based heterostructures Juan Francisco SIERRA GARCIA	194
17:00	Applications of second harmonic generation microscopy on domain boundaries in ferroics Hiroko YOKOTA	215
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

		SESSION J	P11
09:00	Engineering Synthetic 2D Magnetic Materials for Energy-Efficient Computing Cecilia MATTEVI		1876
09:30	Twist and strain engineering of topological and transport properties of graphene on Cr-based trihalides Anna DYRDAL		56
10:00	Development of wafer-scaled topological insulators for spintronics Roberto MANTOVAN		38
10:30	Coffee break		

		SESSION K	P12
11:00	All-electric low-power spin-orbit torque devices Fei WANG		17
11:30	Engineering Spin Orientation and Transport in Magnetic Quantum Point Contacts to Graphene Ivan Jesus VERA MARUN		110

12:00	Unexpected competition between polar displacements and Rashba phenomena in strained SrTiO ₂ Julien VARIGNON	1060
12:15	Orbital to charge conversion in Zr/CoFeB and Zr/Pt/CoFeB via inverse spin orbital pumping and Spin Seebeck effect technique Nakul KUMAR	1691
12:30	Lunch	

		SESSION L	P13
14:00	Morphological Chirality in MoS ₂ Nanostructures Lorenzo BRANZI		1650
14:15	Spatially Resolved Thermoelectric Mapping of Magnetic Domains in Co ₂ MnGa Thin Films under In Situ Magnetic Fields Mohammadali RAZEGHI		1842
14:30	Emerging 2D Ferroelectric Niobium Oxyhalides as Efficient Terahertz Emitters Mengting JIANG		1702
14:45	Probing spin-polarised edge states in InAs/GaSb quantum well devices for spintronics application Abhirami SAMINATHAN		864
15:15	Polaronic effects induced topological phase transitions in quantum (spin) Hall flat band insulators Saurabh BASU		755



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Symposium Q

Sessions: Room 327 | Main Building

Poster Session: 237 (Small Hall) | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

GROUP-IV SEMICONDUCTOR MATERIALS

FOR NANOELECTRONICS AND CRYOGENIC ELECTRONICS

Symposium organizers:

Daniel **HILLER**
(Main Organizer)

Dirk **KÖNIG**

Moritz **BREHM**

Ray **DUFFY**

- Technical University Bergakademie Freiberg
- Australian National University
- Johannes Kepler University Linz
- Tyndall National Institute / University College Cork

Monday, 15 September 2025

CRYOGENIC ELECTRONICS		Q01
09:00	Welcome & Opening Remarks Daniel HILLER	
09:15	Si Electronic Devices Working at Low Temperatures Kao KUO-HSING (FRANK)	178
10:15	Fabrication and characterization of high-fidelity TiN structures for quantum applications Sheshank BIRADAR	927
10:30	Coffee break	

FUTURE TRANSISTOR DEVICES		Q02
11:00	Ultimate Heterogeneous and Sequential 3-D Integration: Recent Breakthroughs, Challenges and Perspectives Thomas ERNST	1258
11:30	Applications of Junctionless Nanowire Transistors Artur ERBE	510
12:00	Exploring electrochemical methods for precision stress control in nanoscale devices Di CHEN	1283
12:15	Biological transistor (bioFET) for the specific and label-free sensing of CRP in unprocessed blood Shubham BABBAR	1671
12:30	Lunch	

DOPING & THERMAL PROCESSING

Q03

14:00	Deterministic doping of silicon: new approaches and future perspectives Michele PEREGO	1055
14:30	Phosphorus Ionization and Charge Transport in Ultra-Thin Silicon Films Andrea PULICI	939
14:45	Crystallization of semiconductor thin films by flash lamp annealing Lars REBOHLE	397
15:00	Pulsed laser crystallisation of sputtered MoS ₂ : thin films synthesis compatible with Si-based devices Alessandro TONON	846
15:15	A scalable approach towards the fabrication of MoS ₂ devices through standard semiconductor processing Daniele DEMENEGHI	1100
15:30	Coffee break	

SILICON QUANTUM DOTS

Q04

16:00	Investigating the Interplay Between Molecular Weight and Silicon Quantum Dot Evolution in Hydrogen Silsesquioxane Jonathan VEINOT	261
16:30	Tuning dominant faceting in silicon quantum dots Katerina KUSOVA	634
17:00	Band-edge electrochemiluminescence of colloidal silicon quantum dots in a thin-layer liquid cell Toshihiro NAKAMURA	440
17:15	Low-Temperature Infrared Absorption Properties of Highly Phosphorus Doped Silicon Nanocrystals Clavel Berclis KENGNE CHOUMELE	1607

POSTER SESSION 1 QP01

17:30	Atomic Layer Deposition of Metal Oxide Monolayers on Thermal Oxide for SiO ₂ -Modulation Acceptor Doping Daniel HILLER	01_1077
17:30	Optimization of O ₃ -Ga ₂ O ₃ Thermal-ALD for SiO ₂ :Ga Modulation Acceptor Doping Shail SHAH	02_1132
17:30	ALD-Al ₂ O ₃ oxidant/precursor variations & SiO ₂ :Al nanolaminates for Modulation Acceptor Doping Daniel HILLER	03_1238
17:30	Hybrid Numerical-ML Framework for Feature Importance Analysis of 10 nm Junctionless GAA FET Design Parameters in Nanoscale Digital Circuits Faycal DJEFFAL	04_1422
17:30	Label-Free Detection of Sodium Azide in Buffer Solution Using Functionalized Nanochannel Chemical Field Effect Transistor (ChemFET) Menka SHARMA	05_1516
17:30	DFT study on thermal equilibrium concentration and stable atomic configuration of Sn atoms in Si or Ge crystals Koji SUEOKA	06_392
17:30	Pressure-controlled growth and structural modification of crystalline silicon thin films deposited on SiO ₂ /Si substrates via ultra-low-pressure thermal CVD Dhiman MONIKA	07_983

Tuesday, 16 September 2025

MODELLING, SIMULATION, MACHINE LEARNING Q05

09:00	From Atomistic to Machine Learning Methods for Simulations and Modelling Novel Electronic Devices Vihar GEORGIEV	277
09:30	Progressing strained layer growth by deep learning Francesco MONTALENTI	319
10:00	First principles calculation of the spin and charge transport properties of group IV alloys Felipe MURPHY-ARMANDO	705

10:15	Optical absorption in hexagonal-diamond Si and Ge nanowires: insights from STEM-EELS experiments and ab initio theory Michele AMATO	633
10:30	Coffee break	

ADVANCED NANOSCALE CHARACTERIZATION

Q06

11:00	Nanoscale terahertz dynamics of silicon surfaces and nanomaterials Frank HEGMANN	1338
11:30	Integrated TEM Approach for Structural, Chemical, and Strain Analysis of Aggressively Scaled Semiconductor Devices Paola FAVIA	870
11:45	Dimensional and analytical metrology of semiconductor nanostructures employing X-ray fluorescence techniques Philipp HÖNICKE	1214
12:00	Characterization methods for metal contamination and gettering to enhance silicon devices performances Océane FEVRIER	1324
12:15	Point defects in proton-irradiated highly Ga- and B-doped Ge Pejk AMOROSO	1446
12:30	Lunch	

MODULATION DOPING

Q07

14:00	Cryogenic Transport in Silicon Structures with Acceptor-Doped Dielectric Shell Soundarya NAGARAJAN	1867
14:30	Modulation-Acceptor-Doped SiGe Schottky Barrier Field-Effect Transistors Andreas FUCHSBERGER	882
14:45	SiO2:Ga Modulation Acceptor Doping: Ga2O3 - PEALD vs. O3-Thermal-ALD Shail SHAH	1137

15:30 Coffee break

SI-GE-SN & OPTOELECTRONICS

Q08

15:45	Towards optical metasurface devices with self-assembled Sn nanoislands on Ge Inga Anita FISCHER	1293
16:15	Shedding light on the lattice strain and interface quality of Si and Ge quantum wells at the nanoscale Giovanni CAPELLINI	248
16:45	Low temperature epitaxy of supersaturated SiGe and Ge layers on Si and SOI Moritz BREHM	1021
17:00	Epitaxial formation and deterministic integration of silicon color centers into light-emitting diodes Johannes ABERL	895
17:15	Gated Hall-bar devices to evaluate the electronic properties of Ge quantum well heterostructures Mehwish HANIF	582

Wednesday, 17 September 2025

9:00 PLENARY SESSION

12:30 Lunch

RECONFIGURABLE FETs

Q09

14:00	Reconfigurable Si, SiGe and Ge nano-sheet Transistors: from Charge Selection to Ferroelectrically Enhanced Neuromorphic Functionality Walter WEBER	1482
14:30	Common Channel Reconfigurable Field Effect Transistors Cigdem CAKIRLAR	811

14:45	Ultra-Low Power Cryogenic Field-Effect Transistors Joachim KNOCH	1349
15:15	Closing Remarks Ray DUFFY	
15:30	Coffee break	
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

NANOIC PILOT LINE WORKSHOP I (JOINT SESSION WITH SYMP. V)

Q11

09:00	NanoIC pilot line – addressing sub 2nm leading edge technologies Inge ASSELBERGHS	727
09:30	Integrating Emerging Materials into Advanced ICs: Tyndall's Role in the NanoIC Pilot Line Niamh WALDRON	590
10:00	Si/SiGe/Si double heterostructure diodes: a promising approach to pseudomorphic lasers for the Si material system Moritz BREHM	1458
10:15	Epitaxy of Ge/SiGe 2D hole gases for quantum electronics Jean-Michel HARTMANN	366
10:30	Coffee break	

NANOIC PILOT LINE WORKSHOP II (JOINT SESSION WITH SYMP. V)

Q12

11:00	New semiconductor channels for advanced nanotechnologies Pierre MORIN	1191
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11:30	Cryo-FIB sample preparation for advanced sub-nanometer S/TEM semiconductor devices metrology Iulian BOERASU	1399
12:00	Hydrogen-Free PVD SiN For Low Loss Waveguides On 300 mm Silicon Platform Eleonora GARONI	1898
12:15	Si/SiGe epitaxial multi-stacks on SOI for CFET devices Anjani AKULA	1395
12:30	Lunch	



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Symposium R

Sessions: Room 437 | Main Building

Poster Sessions: 237 (Small Hall) | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

ULTRA-DOPED SEMICONDUCTORS MADE BY NON-EQUILIBRIUM PROCESSING FOR ELECTRONIC, PHOTONIC AND SPINTRONIC APPLICATIONS IV

Symposium organizers:

Eric GARCIA HEMME

Francesca CHIODI

Sébastien KERDILES
(Main Organizer)

Wei DU

- Universidad Complutense de Madrid
- C2N, Université Paris-Saclay
- Université Grenoble Alpes, CEA-LETI
- University of Arkansas

Monday, 15 September 2025

PULSED LASER MELTING

R02

11:00	Hyperdoping of group IV semiconductors by pulsed laser melting Enrico NAPOLITANI	728
11:30	Hyperdoped and Highly Strained Ge:Sb layers by Pulsed Laser Melting for Next-Generation Cristalline Gamma-Ray Sources Francesco SGARBOSSA	694
11:45	Morphology, Structure, and Composition Modifications by Pulsed Laser Annealing in SiGe Nanostructures Antonino LA MAGNA	799
12:30	Lunch	

HYPERDOPING FOR OPTOELECTRONICS I

R03

14:00	All-silicon waveguide-coupled photodetectors enabling telecom-wavelength detection at room temperature Yonder BERENCEN	301
14:30	Sub-Bandgap Absorption in Silicon via Combined Surface Texturing and Gold Hyperdoping Using Pulsed Laser Melting Núria ROCA-GIMÉNEZ	1753
14:45	Tellurium-implanted Silicon: correlation between impurity lattice location and electrical/optical properties Mao WANG	1519
15:30	Coffee break	

SI, GE DOPING FOR NANO/MICROELECTRONICS I

R04

16:00	Meeting the Needs of Future Nodes - Dopant Activation at Millisecond and Nanosecond Timescales Michael WILLEMANN	700
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16:30	N-type hyperdoping of Ge/Si and SiGe/Si epitaxial layers by UV-nanosecond laser processing Giulia Maria SPATARO	794
16:45	Boron hyperdoping of silicon by solid-phase epitaxial regrowth Alan LE BOTERF	1157
17:00	Ultra-low temperature epitaxy enabling high active doping for advanced logic devices Rami KHAZAKA	1013

POSTER SESSION 1 RP01

17:30	Structural and phase evolution of Te-hyperdoped silicon under thermal annealing Yonder BERENCEN	01_1193
17:30	Heavily doped n-type GeSn for plasmonic-enhanced mid-infrared photodetection Yonder BERENCEN	02_1215
17:30	Enhanced near-infrared absorption in Au-hyperdoped Si: interplay between mid-gap states and plasmon resonance Songyuan PENG	03_1640
17:30	Hyperdoped Ge for plasmonics: tunable plasmonic frequency by doping concentration and plasmonic structural design Minjuan YUAN	04_1641
17:30	Light-trapping and carrier extraction for enhanced sub-bandgap photoresponse in hyperdoped semiconductors Eric GARCÍA-HEMME	05_1707
17:30	Transport Mechanisms in Te-Hyperdoped preamorphized Germanium: Evaluating the Influence of Rapid Thermal Annealing Prior to Pulsed Laser Melting Rafael BENÍTEZ FERNÁNDEZ	06_1849
17:30	Tellurium implanted Si for infrared optoelectronics Shengqiang ZHOU	07_204
17:30	Flash lamp annealing for semiconductor applications Lars REBOHLE	08_398

17:30	Geometrical local molten regions formation on Si surfaces by pulsed laser annealing Sebastien KERDILES	09_486
17:30	Molecular beam epitaxy of III-IV-V alloys for new compound semiconductor materials Ishizu GAKU	10_681
17:30	Lateral GeSn p-i-n waveguide photodetectors covering eitire short-wave infrared band Ting-Yu CHEN	11_777
17:30	Comparative study of rapid thermal and microwave annealing on compressively-strained ultra-doped GeSn alloys on silicon Ruei-Jhang WANG	12_858

Tuesday, 16 September 2025

R05 Si, Ge DOPING FOR NANO/MICROELECTRONICS II

R05

08:30	Short time scale (ns and _s) UV laser annealing solutions: a novel approach for ultra doped semiconductors Zeinab CHEHADI	710
09:30	Leveraging nanosecond laser solid phase epitaxial regrowth to reach ultra-high P active concentrations in Si Mathieu OPPRECHT	1002
09:45	Ex-situ incorporation of Al in Ge by sputter deposition and pulsed laser melting: a new approach to fabricate hyper-doped Ge:Al alloys Enrico DI RUSSO	1084
10:00	Nanosecond UV laser annealing solutions for wafers and panels Thomas MICHALAK	1248
10:30	Coffee break	

GeSn AND OTHER ALLOYS

R06

11:00	GeSn Quantum Well laser advances based on GeSnOI technology Moustapha EL KURDI	763
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11:30	Synthesis of supersaturated GeSn alloys on Ge and Ge-on-Si by nanosecond pulsed laser melting Daris FONTANA	767
11:45	Engineering plasmonic resonance modes in the top layer of Ge _{1-x} Sn _x comb-like grating antennas for mid-infrared photodetection applications. Ali AZIMI	1005
12:00	Hyperdoped GeSn:Sb layers obtained by combining layer deposition process with pulsed UV laser annealing Richard DAUBRIAC	587
12:15	Endotaxy of bismuth into InAs Janusz SADOWSKI	1509
12:30	Lunch	

ULTRADOPING ADVANCED CHARACTERIZATION

R07

14:00	Contribution of atom probe tomography to the study of ultra-doped semiconductors Sébastien DUGUAY	592
14:30	Measuring excited carrier lifetime improvements in hyperdoped semiconductors with using terahertz spectroscopy Meng-Ju SHER	1377
15:00	Structural characterization of hyperdoped Silicon using Precession-Enhanced 4D Scanning Transmission Electron Microscopy Martijn FRANSEN	1794
15:30	Coffee break	

SUPERCONDUCTIVITY IN Si, Ge AND DIAMOND

R08

16:00	Exploiting the “bad” superconductivity of boron-doped diamond for quantum technology applications Georgina KLEMENCIC	567
16:30	Importance of the laser temporal profile on nanosecond laser doped superconducting silicon Aiken VAN WAVEREN	823

16:45	Superconductivity in Ga-Doped SiGe via Ion Implantation and Flash-Lamp Annealing Yu CHENG	1521
17:00	Silicon-Based Superconducting Thin Films: From Material to Quantum Devices Fran_ois LEFLOCH	470

Wednesday, 17 September 2025

9:00	PLENARY SESSION
12:30	Lunch

PLASMONICS IN Si AND GeR09

14:00	Probing hyper-doped Silicium metallicity at optical frequency using Fourier transform spectroscopy Jean-Marie POUMIROL	512
14:30	Studies of near- and mid- infrared plasmonic properties of ultra-doped Silicon Vy YAM	1476
14:45	Influence of SiN/SiO2 passivation on the interaction of a highly doped plasmonic Ge antenna cladding with albumin in the THz range Elena HARDT	195
15:00	Localized surface plasmon resonance in hyperdoped size-controlled Si nanocrystals embedded in a silica matrix Hervé RINNERT	1194
15:30	Coffee break	

HYPERDOPING FOR OPTOELECTRONICS IIR10

16:00	Ultrafast Laser Hyperdoping: From Silicon to Germanium Xiaolong LIU	454
16:30	Strategies for Enhanced Light Absorption in Microstructured Hyperdoped Silicon Pastor DAVID	1844

18:00 YOUNG RESEARCHER AWARDS CEREMONY

18:30 SOCIAL EVENT



2025 Fall Meeting

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KORVUS TECHNOLOGY

Symposium S

Sessions: Room 306 | Main Building

Poster Sessions: 237 (Small Hall) | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

NANOMATERIALS OF THE FUTURE: ADVANCEMENTS IN ENERGY AND SENSING

Symposium organizers:

Maria Caterina **GIORDANO**

– Università degli Studi di Genova

Maria Josè **LO FARO**
(Main Organizer)

– University of Catania

Pedro **M. P. SALOME**

– INL - International Iberian Nanotechnology Laboratory

Sabrina **SARTORI**

– University of Oslo

Monday, 15 September 2025

2D MATERIALS FOR OPTOELECTRONICS

S01

08:30	Multi-scale modelling and simulations of 2D-material based devices for low-power electronics Damiano MARIAN	1038
08:45	Large photoresponse and grain boundaries of LaFeO ₂ -based heterojunctions Jaume GAZQUEZ	1009
09:00	Photodetectors Based on 2D Materials for Near- to Far-Infrared Applications Domenico DE FAZIO	62
09:30	Phonon Engineering in Twisted WS ₂ Bilayers: Tunable Interfacial Thermal Transport for Advanced Thermal Management Jiaqi YANG	1561
09:45	Topological semimetal PtTe ₂ for MIR photodetection Matteo GARDELLA	1729
10:00	Large scale synthesis of multilayer PtSe ₂ for high frequency optoelectronics Pierre LEGAGNEUX	1091
10:15	Universal mechanical exfoliation of large-area transition metal dichalcogenide monolayers Ermes PECCI	1030
10:30	Coffee break	

NANOSTRUCTURED MATERIALS FOR SENSING AND PLASMONICS

S02

11:00	Hydrogen sensing with Al-designed plasmonic metasurfaces Andrea BALDI	87
11:30	Graphene and Copper Nanoparticles based electrochemical sensors for the determination of Glyphosate in Water Uswah YASIN	817

11:45	I-III-VI quantum dots: synthesis, applications and chirality Lorenzo BRANZI	1653
12:00	Platinum-coated Silver Nanoplates: synthesis and application as a reliable SERS substrate Antonio BRANCATO	1360
12:00	Mid Infrared Active Non-Toxic Colloidal Quantum Dots Rajesh BERA	1464
12:15	Interconnected Network of Gold Nanoparticles functionalized with dithiols: synthesis, characterization and sensing application Beatrice PENNACCHI	802

MATERIALS FOR BIOSENSING

S03

13:45	Biomass-derived carbon materials modified with gold nanoparticles for acetaminophen sensing Livia Alexandra DINU	1825
14:00	Array-based Polymer-Phage Biosensors for Detection and Differentiation of Bacteria Enkhlin OCHIRBAT	579
14:15	Attomolar Detection with Gold Nanoclusters: A Biocompatible Approach to Sensing in Blood Matrices Regina Maria CHIECHIO	257
14:30	Experimental and DFT Investigation of MXene/Cu ₂ O-Modified Quartz Tuning Fork Sensors for Ultrasensitive Glucose Detection Abdullah ALODHAYB	912
14:45	Nanoengineered Capsule System Incorporating Gold Nanoparticles for Contrast-Enhanced Multimodal In Vivo Cell Tracking Sneha SINGH	781
15:00	Precision Sensing at the Nanoscale: Probing extracellular vesicle drug interactions for cancer therapy monitoring Sijun PAN	1546
15:15	ZnO Tetrapod-Coated Silicon Nanowire Sensor for Real-Time and Non-Invasive Respiratory Monitoring Muhammad Taha SULTAN	1772
15:30	Coffee break	

NANOMATERIALS FOR ENVIRONMENTAL SENSING

S04

16:00	Ammonia Sensing via Pseudo Molecular Doping in UV-Activated Ambipolar Silicon Nanowire Transistors Vaishali VARDHAN	1793
16:15	W-Cr Janus-like thin film nanocolumns for gas sensing Guillem VILAR	394
16:30	A paper-based vapoluminescent chemosensor of a Zinc(salen)-type complex for the discriminative and sensitive detection of volatile diamine vapors Agostino ATTINA	664
16:45	Designing ultra-high performance VOCs gas sensors utilizing Tungsten tri-oxide(WO ₃) compositing with 2D graphitic carbon nitride(g-C ₃ N ₄) at room temperature(RT). Meghana N	1680
17:00	Capacitive Humidity Sensor based on Ultrathin Zn-HKUST-1 Nanosheets Thin Film for AI-powered Applications Syed Adil SARDAR	555
17:15	New chromogenic and fluorogenic Zn(salen-type) molecular materials and their potential application as sensor arrays for the detection of heavy-metal cations in seawater/wastewater Sara SCUDERI	702

POSTER SESSION

SP01

17:30	Liquid-Metal-Derived BiSn Core-Shell Particles: An Intrinsic Single-Particle Platform That Unites Broadband Light Harvesting with Record Photothermal Conversion Simge CINAR-AYGÜN	01_1119
17:30	Versatile synthesis of silver and silver-derived aerogels for enhanced electrocatalysis Beibei WENG	02_115
17:30	Probing the Electrochemical Activity of the 114 Cobaltite Structures for the Oxygen Evolution Reaction Abhishek BHARTI	03_1150
17:30	Study of Energy Application based on Nanostructured Conducting Polymers Perizat ASKAR	04_1244

17:30	Molecularly Engineered Self-Doped and Ionic Polymers: A Pathway to High-Efficiency Solar Cells and Rechargeable Batteries Dana KANZHIGITOVA	05_1249
17:30	High-Piezoelectric properties of GaN Nanowires for Powering Medical Implants Szu-Wei CHEN	06_1288
17:30	Enhancing Solar Evaporation Efficiency Using Nickel Ferrite Nanoparticles: Experimental and Analytical Insights Kousik PRADHAN	07_1386
17:30	Enhanced Hydrogen Storage in Bimetallic ZIF-67: Tuning Porosity through Metal Substitution Aigerim OSPANNOVA	08_1528
17:30	Enhancing Triboelectric Nanogenerators Performance with MXenes -Silicone Nanocomposites: A Leap Forward in Energy Harvesting and Touch-Sensitive Technologies Navaneeth MADATHIL	09_1662
17:30	Peony-Structured ZIF-8-infused lyophilized Hydrogel as a high-performance Bifunctional Electrocatalyst for Hydrogen Peroxide Fuel Cells and its Electrochemical Detection in Tap Water Samples Manaswini RAVIPATI	10_169
17:30	Engineering Duo-Dimensional MoS ₂ for Efficient DC-Link Energy Storage in Electric Vehicles Vimal Kumar MARIAPPAN	11_1815
17:30	Engineering Valence State of Ni in Ni ₃ P@PPy Composite for Selective Application Jong Hun KIM	12_200
17:30	Conformal surface intensive doping of low-valence Bi on Cu ₂ O for highly efficient electrochemical nitrate reduction to ammonia production Won Tae HONG	13_201
17:30	Construction of MoS ₂ Nanosheets/Hydrogenated Graphene Hybrid Catalysts for Highly Efficient Electrocatalytic Hydrogen Evolution Xiuxiu HAN	14_328
17:30	Interface engineering and band alignment studies of Cu doped NiO as a hole transport layer for triple cationic perovskite solar cells Puja PUJA	15_340
17:30	Synthesis, structure and electronic properties of perovskite thin films CH ₃ NH ₃ PbX ₃ (X=Cl, Br, I) Volodymyr KARBIVSKYY	16_352

17:30	Synthesis of Mixed Phase Iron Oxide Nanoparticles by Thermal Plasma in a Magnetic Field Environment Savita PANNU	17_412
17:30	Synthesis of an indirect Z-scheme ZnO-Au-WO ₃ thin films for PEC water oxidation Muhammed L FATTY	18_529
17:30	Dielectrophoretic Assembly of Metal Nanowire Electrodes for Highly Efficient On-Chip Micro-Supercapacitors Yeonwoo KIM	19_615
17:30	Magnetic Self-Assembly of 3D Micro Pillar Electrodes for Highly Effective Supercapacitors Seongyeol KIM	20_617
17:30	Understanding the impact of doping on the structural, hydrolytic, and thermal stability of HKUST-1 Priya MAHATO	21_80

Tuesday, 16 September 2025

NANOMATERIALS FOR ENERGY AND CATALYSIS

S05

08:45	Transition metal nitrides and carbides syntheses from metallic clusters: applications to heterogeneous catalysis Franck TESSIER	1539
09:00	Energy Nanostructures at Atomic Scale: AI-automatic detection of single atoms and vacancies in 2D & 3D catalysts Jordi ARBIOL	31
09:30	Electrocatalytic Modulation using Vibrational Strong Coupling Jyoti LATHER	1135
09:45	High Entropy Alloys based-Electrocatalysts developed on Ni-fiber and used for Water Electrolysis Yashwant Pratap KHARWAR	258
10:00	Laser irradiation in water of Graphene Oxide for Oxygen Evolution Reaction Cristiano LO PO	600
10:15	Ordered assembly of plasmonic nanoparticles for enhanced hydrogen evolution reaction Muhammad HARIS	1704

10:30 Coffee break

ADVANCED MATERIALS AND NANOSTRUCTURES		S06
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11:00	The Material Evolution Revolution Erik GARNETT	348
11:30	1D to 2D Photoswitchable Plasmonic NP Superstructures Jaime Gabriel TRAZO	649
11:45	1T MoS2 synthesis with tailored morphology from liquid phase Lifu ZHANG	1344
12:00	Local strain engineering in 2D TMD semiconductor nanocircuits via thermal-Scanning Probe Lithography Giorgio ZAMBITO	1438
12:15	Safe and Sustainable by Design MOF beads for Selective Entrapment of Rare Earth Elements Prathmesh BHADANE	42
12:30	Lunch	

MATERIAL DESIGN AND OPTIMIZATION		S07
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14:00	Accelerating materials research with machine learning Miguel MARQUES	1095
14:30	Bioinspired and biotemplated semiconductor nanostructures derived from butterfly wings with structural coloration Gábor PISZTER	1242
14:45	From unusual building blocks to responsive 2D systems at the air/water interface Jan PACZESNY	1276
15:00	Suppressing surface amorphization in BSCF-based perovskites through A-site deficiency for use as anodes in water electrolysis. Sarah GEO	1326

15:30 Coffee break

NANOMATERIALS FOR SENSING

S08

16:00	Large Area PEDOT:PSS-Graphene Electrode for Minimally Invasive Biosensor Paolo CORSARO	1486
16:15	Ternary Nanoparticle Systems for Next Generation Catalyst and Sensing Materials Martin NEUMEIER	1236
16:30	Influence of Layer Number and Oxidation State on the WS ₂ Acetone Sensing Yusuke TANIZAKI	1721
16:45	Organic Mixed Ionic Electronic Conductors Nanochannels fabrication for Vertical Electrochemical and Ionic Transistors Francesco DECATALDO	1512
17:00	Piezoelectric MEMS VOC Sensors Enabled by Polymeric Thin Films and Nanostructures Duygu AKKOC	1176
17:15	Flexible Capacitive Touchscreen with Silver Nanowires for Tactile Displays Using Gesture Recognition for the Visually Impaired Ahmed HAMZA	491

POSTER SESSION 2

SP02

17:30	Plasmonic Effect of Ag-Au Bimetallic Nanoparticles on GaN-based Photodetectors Fabricated by Sputtering Method Eun Kyu KIM	01_105
17:30	Synthesis of high-quality and high yield Ti ₃ C ₂ T _x MXene assisted by in-situ intercalation Muhammad Imran RAMEEL	02_1056
17:30	Surface-Enhanced Raman Spectroscopy of Gold-Nanoparticle-Decorated Random Networks of Single-Walled Carbon Nanotubes Brahim AISSA	03_1131

17:30	Numerical analysis of metasurfaces for field intensity enhancement in silicon substrate for photodetection Roxana TOMESCU	04_1133
17:30	Inorganic nanolayers of noble metals and their compounds Natalia SZCZEPANSKA	05_1232
17:30	Exploring metasurface-based fluorescence enhancement in azulene-tetrazole derivatives for biosensing applications Veronica ANASTASOAI	06_1235
17:30	Highly Sensitive NO ₂ Sensor Based on Conjugated Polymer Backbone Alignment Bum Hwan KIM	07_1264
17:30	Portable acoustic biosensing platform combined with paper-based fluidics and biofunctionalized AuNPs as signal amplifiers for the detection of protein biomarkers Dimitra CHRONAKI	08_1304
17:30	Enhanced Fluorescence-Based DNA Detection Using Nanoimprinted Au-PVDF Biosensors Ghadeer ALMOHAMMADI	09_133
17:30	Synthesis of Palladium Nanostructures as a Substrate for UV-SERRS Lina MIKOLIUNAITE	10_1379
17:30	Spectroscopic Detection of Explosives Sevki Can CEVHER	11_1418
17:30	Microwave-assisted growth of zinc oxide nanostructures for impact pressure sensing applications Maria MORAIS	12_1469
17:30	Wide Dynamic Range and Ultralow-Light Detection in FAPbI ₃ Perovskite photodetectors via HTL Engineering Prabal Dweep KHANIKAR	13_1696
17:30	Efficient Dark Current Suppression in Solution-Processed PbS Quantum dots-based Near-Infrared Photodetectors Through Remote Trap Passivation Parmod KUMAR	14_1698
17:30	Short and Mid-Wave Infrared Photodetection Using Low-Noise Black-Arsenic/Germanium Heterostructure Harmanpreet Kaur SANDHU	15_1752

17:30	Fabrication of the magnetic halides nanowires confined within single-walled carbon nanotubes and their crystal structure analysis Aleksandra FIDLER	16_1802
17:30	Femtosecond Laser-Engineered Copper Nanostructures for Efficient Ultraviolet Surface-Enhanced Raman Sensing Martynas TALAİKIS	17_320
17:30	UiO-66(Zr):_Tb3+, Eu3+/PVDF Composite Films for Dual-emissive Optical Thermometry Above Physiological Temperature Ipshita MAJUMDAR	18_384
17:30	Visible Light-Driven Electronic Nose Based on Type-I In2S3/In2O3 Heterojunction Array for Selective Multi-Gas Discrimination Ki Chang KWON	19_391
17:30	Development of Pt Nanoarray Electrodes via Electroplating for Enhanced Hydrogen Peroxide Detection Youngwoo LEE	20_611
17:30	Improved Face-Selective DEP Assembly of Fin-LEDs via Dielectric Pixel-Defining Layer on Interdigitated Electrodes Heemin OH	21_639
17:30	Front, Back, and All Around: Measuring Chirality in Perovskites the Right Way Arina NARUDIN	22_656
17:30	Direct nanoimprinting for the fabrication of high resolution, high aspect ratio metasurface Sung-Hoon HONG	23_738
17:30	Label-Free Detection of Sodium Azide in Buffer Solution Using Nanochannel Chemical Field Effect Transistor (ChemFET) Menka SHARMA	24_863

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

MATERIALS FOR PHOTOVOLTAIC AND ENERGY APPLICATIONS

S09

14:00	Tailoring nanostructured photovoltaic window layers for solar to fuel conversion Negar NAGHAVI	730
14:30	Optimization and Development of Light Management Schemes for Ultrathin and Bifacial Solar Cells António OLIVEIRA	1196
14:45	Aesthetically Tunable Flexible CIGS Solar Cells for Integrated Photovoltaic Applications Xavier Leítao PINHEIRO	259
15:00	Advancing Thin-Film Photovoltaics: Single-Step CIGS Fabrication and Low-Temperature AgBiS ₂ Absorbers Neha KUMARI	709
15:30	Coffee break	

NANOMATERIALS FOR ENERGY AND CATALYSIS

S10

16:00	Multi-pattern single-step nanofabrication enabling novel rear architectures for ACIGS solar cells André VIOLAS	1246
16:30	Spectroscopic Insights into Reverse Bias Effects in Wide-Bandgap Perovskite Solar Cells Simone BARBAROSSA	1755
16:45	Al-Doped ZnO Nanostructures for Transparent Electrochemical Capacitors: Pioneering Structural Energy Storage and Temperature Sensing Solutions for Smart Buildings Febin PAUL	1330
17:00	Interlayer Anion-Driven Synergy at NiFe-LDH/Nickel Cobaltite Heterointerface for Energy-Efficient Alkaline Water Electrolysis Minakshi SHARMA	877

17:15	Lead-Free Piezoelectric Ceramics for Energy Conversion and Packaging Applications Dhanranjan KUMAR	1751
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

SUPERCONDUCTIVITY AND QUANTUM EFFECTS

S11

08:45	EuS interfaces for low temperature spintronics Sara CATALANO	688
09:15	Ultralow Lattice Thermal Conductivity and Colossal Thermoelectric Figure of Merit of the Room Temperature Antiferromagnet CsMnBi Shubham Rakesh SINGH	102
09:30	Hybrid Josephson junctions based on InSb nanoflags Matteo CARREGA	1672
09:45	Synergistic Pyro-Photo-Catalytic Hydrogen Evolution Driven by Ferroelectric/Semiconductor Heterojunction Salma TOUILI	929
10:00	Interface Engineering of Ag@Au Nanohybrid for Ultra-strong Electron-phonon Coupling and Non-classical Electron Transport Tuhin Kumar MAJI	1853
10:15	Nanoscale thermoelectric energy generation through the realisation of quantum interference effects in self-assembled molecular-scale junctions Benjamin ROBINSON	1748
10:30	Coffee break	

WEARABLE AND SENSING INTERFACES FOR HEALTH AND ENVIRONMENT

S12

11:00	Sprayed Graphene for Wearable Textile-Triboelectric Nanogenerators and Biomechanical Sensors Hongyang DANG	232
11:15	Doped graphene based nanozyme for ultrasensitive electrochemical detection of pollutants Livia Alexandra DINU	1162
11:30	Flexible Metal-oxide Graphene Composite-based Nitrate monitoring sensor Prasutha MARKAPUDI	1267
11:45	“Zero-on” NIR-II Photoacoustic Organic Nanoprobes for Ultra-accurate Companion Diagnostics in Early Cancer Immunotherapy Response Xiaomei LU	959
12:00	Acoustic-Based Damage Detection Using ZnO Sensors: A Machine Learning Approach for structural damage detection employing ambient vibrations Keshavmurthy Subramanian SRIKANTH	1432
12:30	Lunch	

NANOMATERIALS FOR OPTOELECTRONICS AND ENERGY SYSTEMS

S13

14:00	Ultrathin dielectric layers in Bragg Reflector configuration as UV filter coatings Ricardo SILVA	176
14:15	Cu-doped Nanocrystal Carbon Dots for Integrated Fabrication of Ultrabright Luminescent Solar Concentrators Mahnoor HASSAN	417
14:30	Effect of Post-Synthesis Treatments on 1L-MoS2 Nanocomposite Properties Emanuele SANGIORGI	1719
14:45	Enhanced Removal of PMMA Residues from Graphene via Time and Temperature Assisted Solvent Cleaning Monika CHOUDHARY	465

15:00	Efficient and Sustainable Solar Water Evaporation Using Photothermal BiSn Core-Shell Particles Duygu INCE	659
15:15	Cost-ffective NiFe Oxides for Stable and Efficient OER in Surrogate Seawater Soumia EL BOUMLASY	484
15:30	Coffee break	

CATALYSTS FOR HYDROGEN GENERATION AND WATER SPLITTING S14

16:00	Tuning defects on the basal plane of ultra-large MoS2 monolayers for hydrogen evolution reaction Murilo SANTHIAGO	75
16:15	Exploring Ta_N_ Nanostructures for Hydrogen Production through Water Vapor Photoelectrolysis Salman MUHAMMAD	416
16:30	Au@Cu_S_-Decorated TiO_ Nanowires with Full-Spectrum Responsiveness for Enhanced Solar Hydrogen Production Chun-Yi CHEN	540
16:45	Activation of metal oxides by microwave irradiation and induction heating as new strategies for hydrogen production Maria TAENO	629
17:00	Hydroelectric cell fabrication and hydrogen generation using hollow sphered silver ferrite nanoparticles Shashank Bhushan DAS	1746
17:15	Silver Contamination from Ag/AgCl Electrodes and its Implications for Nanoscience Chuhongxu CHEN	1682



Symposium T

Sessions: Room 219 | Main Building

Poster Sessions: 237 (Small Hall) | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

SMART MATERIALS FOR NANOELECTRONICS - NANOPHOTONICS & EUROPEAN DOCTORATE NETWORK: PCAM (PHYSICS AND CHEMISTRY OF ADVANCED MATERIALS) SUMMER SCHOOL 2025

Symposium organizers:

Dawid JANAS
Franciszek KROK
Horst-Günter RUBAHN
(PCAM Chair)
Sigitas TAMULEVICIUS
Yannick J. DAPPE
(Main Organizer)

- Silesian University of Technology
- Jagiellonian University
- University of Southern Denmark
- Kaunas University of Technology
- Yogendra Kumar MISHRA

Monday, 15 September 2025

		SMART DEVICES	T01
09:00	Wireless Electroassisted Chiral Resolution with Miniaturized Tubular Devices Sara GRECCHI		1866
09:30	Data-Driven Insights into the Forming Ability of Thin-Film Metallic Glasses via Bayesian Classification Xuliang LUO		1852
09:45	Compact Stretchable Ultrasound Arrays via Surface Charge Engineering for Gesture and Material Detection Naveen TIWARI		1736
10:00	Improving the stability of thin films for molecular electronics through on-surface cross-linking Richa ARJARIYA		1717
10:15	Biological transistor (bioFET) for the specific and label-free sensing of CRP in unprocessed blood Shubham BABBAR		1670
10:30	Coffee break		
		PLASMONIC NANOSTRUCTURES	T02
11:00	Gold nanoparticle based thin films for optical and electrical sensing Casper KUNSTMANN		1856
11:30	Detection and Analysis of Biological Particles using Terahertz (THz) to Infrared (IR) Metamaterial Impedance Spectroscopy Rudrarup SENGUPTA		1637
11:45	Emission rate of conjugated molecular emitter near plasmonic nanostructures: point-dipole approximation and forbidden transitions Colin VAN DYCK		1174
12:00	Architecture Optimization and Sensitivity Enhancement of Nano-structure Metamaterials for Impedance Spectroscopy in Terahertz Heena KHAND		1638
12:15	A finer approach towards 1D microparticle chains formation: methods, mechanisms, and applications. Gunjan TIWARI		1270

12:30 Lunch

CATALYTIC AND ENERGY MATERIALS		T03
14:00	Ag/Au/Pd Modified Hierarchical Porous Ni Foams for Efficient CO2 to Dimethyl Carbonate Conversion Sanjeev Kumar SHARMA	1858
14:30	Filamentary mechanism of resistive switching in CuO-based memristors Monika OZGA	90
14:45	A twist for tunable electronic and thermal transport properties of nanodevices Karolina MILOWSKA	1455
15:00	Fabrication of Transition Metal Oxide thin films employing RF Magnetron Sputtering for Resistive Random Access Memory Devices Devesh Kumar AVASTHI	1764
15:30	Coffee break	
NANOMATERIALS DEVICES		T04
16:00	Sustainable and highly durable Nanowires for Flexible Electronics Vipul SHARMA	1804
16:30	2D Transition Metal Oxides for Memristive Devices: A Case Study on MoO3 Resistive Switching Aleksandra NADOLSKA	1375
16:45	Harnessing the Efficiency of Twin Boron Nitride and Graphene Monolayers for Anticancer Drug Delivery: Insights from DFT Basant ROONDHE	1728
17:00	Flexible optoelectronic devices for wearable and implantable photodynamic therapy Peng LI	1790
17:30	Low temperature Characterization of MOCVD Graphene Hall Sensor: Responsivity, Sensitivity, and Noise Behavior. Rajveer Singh RAJAURA	1869

POSTER SESSION 1

TP01

17:30	Direct, Ligand-Free Synthesis of Highly Luminescent Ternary Chalcogenide Quantum Dots Apostolos KALAFATIS	01_1061
17:30	Bimetallic Plasmonic Nanostructures for SERS Gytaute SIRGEDAITE	02_1593
17:30	Copper-based deep ultraviolet surface enhanced Raman scattering Shivani YADAV	03_1625
17:30	Enhanced NO ₂ Gas Sensing with Spray-Deposited ZnO Thin Film Sugato HAJRA	04_1674
17:30	Biomaterial-based triboelectric nanogenerator and battery-free humidity sensor Swati PANDA	05_1675
17:30	Multifunctional Use of Calcium Copper Titanate for Energy Harvesting and Drug Contaminant Removal Kushal Ruthvik KAJA	06_1683
17:30	Light induced faster absorption and desorption of hydrogen in PdAg alloy thin film revealed by in-situ Synchrotron XRD Madhuri SURYA	07_1766
17:30	Novel 2D/3D Interface-Engineered MXene-ZnO Tetrapod Electrode for Asymmetric Supercapacitor Device. Sahil JANGRA	08_1776
17:30	Incorporation of CoFe ₂ O ₄ Nanoparticles and Graphite Flakes in Cement Matrix and its Influence on Microwave Absorption Properties Vanamoorthy MARIAPPAN	09_1796
17:30	Unveiling the Intrinsic Optical Anisotropy of ZnO Thin Films on Isotropic Substrates Jordi GOMIS BRESCÓ	10_1806
17:30	Nano-structured Ag-modified Co ₃ O ₄ for degradation of Methylene Blue: effect of Ag content on physicochemical and photocatalytic properties Aya BENSLIMEN	11_1841

Tuesday, 16 September 2025

BIOSENSORS

T05

09:00	Tungsten Oxide and its composites for sensing and other applications Ratnesh PANDEY	1781
09:30	Ultrasensitive Point-of-Care Detection of Luteinizing Hormone Using a Flexible Pd-Ti3C2 MXene-Based Electrochemical Biosensor for Women's Health Applications Akanksha SHRIVASTAV	393
09:45	A finer approach towards 1D microparticle chains formation: methods, mechanisms, and applications. Gunjan TIWARI	1575
10:00	Synthesis and characterization of luminescent ZrO2 nanoparticles doped with rare-earth ions for biological applications Julita ROSOWSKA	1544
10:15	Development of Selective VOC Biomarker Sensing Materials for Healthcare Applications Sunny SHARMA	1631
10:30	Coffee break	

2D MATERIALS

T06

11:00	Thermoelectric Power Generation Below Room Temperature by 2D Layered Chalcogenide Crystals and Other Materials Casper KUNSTMANN	1865
11:30	Flat-optics 2D TMD semiconductor heterostructures for large-area photoconversion applications Maria Caterina GIORDANO	1247
11:45	Effect of Surface Wettability on Electrochemical Performance Characteristics Dr Sunil LUHAR	1656
12:00	Colloidal (de)stabilization of graphene nanoplatelets and mesosponges for formulation of graphene based nanofluids Tamas SZABO	1663
12:15	Nano-engineered Materials for Wastewater Remediations Ajay Kumar MISHRA	1701

12:15

Nano-engineered Materials for Wastewater Remediations
Ajay Kumar MISHRA

1701

12:30

Lunch

CARBON MATERIALS

T07

14:00

Scalable, Highly Uniform and Low-cost Carbon Nanostructures
Numan SALAH

1864

14:30

Wrapped Right: Targeted Extraction of SWCNTs with Conjugated Polymers
Dominik JUST

595

14:45

Atomistic Modeling of CNT Growth from Ferrocene: Influence of Cyclopentadienyl Ligands and Carbon Feedstocks
Narayan N. SOM

1102

15:00

Hydrothermally Synthesized ZnO Nanorods (ZNRs) and Nitrogen doped Carbon Quantum Dots (N-CQDs): N-CQDs/
ZNRs Hybrid Thin Film UV Photodetectors
Kuppusamy THANGARAJU

264

15:30

Coffee break

ENERGY MATERIALS

T08

16:00

Why carbon behaves differently in energy storage devices
Amrita JAIN

1754

16:30

High-Performance Quasi-Solid-State Supercapacitors based on Nickel-Doped MoS2 Pompom Nanostructures
Abhishek PANGHAL

1127

16:45

Effect of hole transport layers on response speed of inverted perovskite solar cells
Rajapaksha MUWANWELLA

1303

17:00

Mesoporous WO3 Nanoplates: Smart Materials for Integrated Photonic Energy Storage and Catalysis
Tariq SAJJAD

1774

17:30	Trimodal Thermal Energy Storage Materials with High Heat Storage Capacity Karolina MATUSZEK	1496
18:00	Operando X-ray absorption spectroscopy on MAX and MXene-based electrodes for Na and Li-ion batteries Martina FRACCHIA	1877

POSTER SESSION 2 TP02

17:30	Nanocrystalline ZnSnN ₂ and ZnTiN ₂ with improved optoelectronic features grown by High-Power Impulse Magnetron Sputtering for photoconversion applications Rachele TOSI CELLI	01_1017
17:30	Concentration-Controlled Patterning of Single-Crystalline Perovskite Microarrays Omolara ADISA	02_1086
17:30	Plasmonic resonances in cylindrical and conical-shaped silicon nanowires. Rizwan RAFIQUE	03_1180
17:30	Silver Nanoplates transformation under solvent exchange Antonio BRANCATO	04_1352
17:30	Label-Free Detection of Sodium Azide in Buffer Solution Using Functionalized Nanochannel Chemical Field Effect Transistor (ChemFET) Menka SHARMA	05_1515
17:30	Ir Nanostructures decorated 3D ZnO Tetrapodal Nanocomposite with Enhanced Electrocatalytic Performance Shivalingayya GADDIMATH	07_196
17:30	From Colloids to LEDs: Thiophene-Driven Surface Engineering of AgInS ₂ Quantum Dots Spyros ORFANOUDAKIS	08_506
17:30	Conjugated polymer extraction for obtaining chirality-controlled single-walled carbon nanotubes Cosmos UZOMA	09_516
17:30	Laser-Induced Covalent Janus Functionalization of Graphene for Programmable Electronic Asymmetry Shishi LIU	10_801

Wednesday, 17 September 2025

9:00 PLENARY SESSION

12:30 Lunch

PIEZOMATERIALS

T09

- | | | |
|-------|--|------|
| 14:00 | MnCoFeS ₄ @MoS ₂ piezoelectric nanogenerator?integrated supercapacitor: Turning biomechanical energy into green hydrogen production
Sasikumar RAGU | 1850 |
| 14:30 | Orange Peel-Based Triboelectric Nanogenerator for Sustainable Energy Harvesting Applications
Ajani Lakmini Jayarathna JAYASINGHE ARACHCHILAGE | 1681 |
| 14:45 | Flexible optoelectronic devices for wearable and implantable photodynamic therapy
Peng LI | 1784 |
| 15:15 | Electron-beam spectroscopy of metallic and dielectric nanoparticles
Panagiota Elli STAMATOPOULOU | 1885 |
| 15:30 | Trimodal Thermal Energy Storage Materials with High Heat Storage Capacity
Karolina MATUSZEK | 757 |
| 15:30 | Coffee break | |

HEALTHCARE MATERIALS

T10

- | | | |
|-------|--|------|
| 16:00 | Temperature Stabilization in Directed Energy Deposition Additive Manufacturing: A Case Study on SS316L
Ayca Mircan OZCAN | 1848 |
| 16:30 | Investigation of Process Parameter Effects on Elastic Modulus via Vibration-Based Non-Destructive Testing in Additive Manufacturing
Nurcan CEVIK | 1838 |
| 16:45 | Effects of process parameters on porosity for the additive manufacturing of molybdenum
Nafel DOGDU | 1831 |

17:00	Improved Properties Of Additively Manufactured Hybrid Lattice Structures with Novel Design Approach Seymanur SIRTLI	1826
17:15	Tailoring Grain Structure, Porosity and Hardness of DED Fabricated Inconel 718 via Normalised Directed Energy Density (NDED) Alkim AYDIN	1813
17:30	Bio-inspired Out-of-Equilibrium Semiconducting Hydrogels: Unlocking Fuel and Light-Responsive Transient Conducting Properties Ruchi SHUKLA	
17:30	Fabrication and Properties Ti64 Advanced Bone Implants: Materialistic View Muhammad Usama ZAHEER	

Thursday, 18 September 2025

NANOCOMPOSITES		T11
09:00	Shedding Light on Electromagnetic Interference Shielding / Microwave Absorption in Advanced Nanocomposites Raghvendra Singh YADAV	1600
09:30	Cement Composites Based on Graphite / MnFe2O4 Spinel Ferrite Nanoparticles for Electromagnetic Interference Shielding and Microwave Absorption Application Vanamoorthy MARIAPPAN	1798
09:45	Ultrasonically Synthesised CoFe2O4 and ZnO Nanoparticles and their Polymer Nanocomposite for Enhanced EMI Shielding: A Comprehensive Investigation Vanamoorthy MARIAPPAN	1801
10:00	Compressive Strain in FAPbI3 to Suppress Non-radiative Recombination: Toward a 2D/3D System Perovskite for High Efficiency Solar Cells Lilian Amen DAVID-EGBUNU	1870
10:30	Coffee break	
EMERGENT MATERIALS		T12
11:00	Liquid-Metal-Derived BiSn Core-Shell Particles: An Intrinsic Single-Particle Platform That Unites Broadband Light Harvesting with Record Photothermal Conversion Simge CINAR-AYGÜN	1839

11:45	Tailoring Mechanical Properties of a Single-Phase BCC High Entropy Alloy via Spinodal Decomposition and Microstructure Control Emre GUNES	1821
12:00	Mechanical Characterization of Silicon Oxide Thin Films for Sound Velocity Determination via Nanoindentation Peter NAGUIB	61
12:15	Tetrapods based Advanced Materials for Advanced Technologies Yogendra MISHRA	260
12:30	Controlled Selective Laser Melting of Ti6Al4V Implants for Tailored Surface Morphology and Enhanced Osseointegration Muhammad Hassan RAZZAQ	1872
12:30	Lunch	



Symposium Sponsors



Helmholtz Innovation Platform
for Accelerator-based
Technologies and Solutions

Symposium U

Sessions: Room 315 | Main Building

Poster Sessions: 237 (Small Hall) | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

METAL OXIDE NANOMATERIALS FOR ADVANCED OPTOELECTRONICS AND ENVIRONMENTAL APPLICATIONS

Symposium organizers:

David **HORWAT**

Jung Hyuk **KOH**

Raul **GAGO**

Renata **RATAJCZAK**

Slawomir **PRUCNAL**
(Main Organizer)

- Université de Lorraine
- Chung-Ang University
- Instituto de Ciencia de Materiales de Madrid
- National Centre for Nuclear Research
- Institute of Ion Beam Physics and Materials Research

Monday, 15 September 2025
PHOTOCATALYTIC MATERIALS I
U01

09:00	Advanced metal oxide nanomaterials for wastewater remediation Giuliana IMPELLIZZERI	253
09:30	High-Sensitivity VOC Sensing Using In ₂ O ₃ @ZnO Core@Shell Nanowires Fabricated via Block Copolymer Templating and Atomic Layer Deposition Zofia ZAWISTOWSKA	1202
09:45	Ferrite-Based Nanoparticles for Photodegradation of Organic Dyes Tso-Fu Mark CHANG	158
10:00	Atomic Layer Deposition of NiO: Investigating the Potential of New Precursor Combinations for Photoelectrochemical Water Oxidation Vyshnav KANNAMPALLI	324
10:15	Enhancing Optical Properties of Ta ₂ O ₅ Thin Films Grown by Radiofrequency Magnetron Sputtering through Rapid Thermal Annealing Julien CARDIN	1035
10:30	Coffee break	

METAL OXIDES FOR OPTOELECTRONICS I
U02

11:00	Low-temperature chemical deposition of Cu ₂ O thin films with record transport properties David MUNOZ-ROJAS	917
11:30	Strongly thermochromic W-doped VO ₂ films with a large temperature coefficient of electrical resistance near room temperature Sadoon FARRUKH	9
11:45	Multiscale investigation of ZnO nanorods' photoresponse mechanism using C-AFM, KPFM and XPS Monika OZGA	91
12:00	Interfacial electronic properties of ZnO/CoPc hybrid structures Sakineh AKBARI NIA	407

12:15	Deposition of Semiconducting ZnMgO/Cu ₂ O Heterostructures via Ultrasonic Spray Pyrolysis and Spin-Coating: Process Optimization for Optoelectronic Applications Wafae EL BERJALI	458
12:30	Lunch	

PHOTOCATALYTIC MATERIALS II

U03

14:00	Development of hybrid metal oxide semiconductors with modified photocatalytic response David G. CALATAYUD	1453
14:30	Dunino Raw Halloysite Mineral for Emerging Pollutants Removal from Water Simona FILICE	1735
14:45	Advanced Nanoarchitectures of Cu ₂ O-Based Metal Oxides for Efficient Photoelectrochemical Water Splitting Yerbolat MAGAZOV	901
15:00	Intrinsic Limitations to Mobile Charge Carrier Yield in Fe-Based Metal Oxide Photoanodes for Solar Water Splitting Daniel GRAVE	922
15:30	Coffee break	

ENERGY AND ENVIRONMENTAL APPLICATION

U04

16:00	Metal oxide composites for energy and environmental applications Alberto VOMIERO	1868
16:30	Anatase TiO ₂ as a Coating Material for the Separators of Fuel Cells Tomohito SUDARE	1097
16:45	CO ₂ Laser Integration with RF Sputtering for Enhanced Crystallinity of Wide Bandgap Semiconductors for Power Electronics Chang Hyeon JO	952

17:00	Deposition of CeOx- and SnOx- Based Thin Films via Magnetron Sputtering for Gas Sensing Applications Amanpreet KALRA	627
17:15	Ambient-Temperature Dual Gas Sensing with In ₂ O ₃ Thin Films: Unveiling the Role of Surface and Structure Roopa .	946

POSTER SESSION 1 UP01

17:30	Photon Extraction Enhancement in Emitter via Arrayed and Tapered-Etched Nanostructures with Plasmonic Coupling Seo-Eun KANG	01_1019
17:30	The Electrical Characteristics of AZO/p-GaN Heterojunction for Power Devices Go-Eun BANG	02_1020
17:30	Characterization of ZnO Nanorod Gas Sensors Fabricated on Anodized Aluminum Oxide Templates Jeonghye YOON	03_1029
17:30	ITO-based structures for smart windows and radiative cooling: a spectroscopic ellipsometry investigation Ermes PECI	04_1044
17:30	Multifunctional Tb ³⁺ , Eu ³⁺ , and Li ⁺ Co-Doped CaMoO ₄ Phosphor: Tunable Emission, Antibiotic Sensing, and Non-Contact Optical Thermometry Astha TYAGI	05_1073
17:30	Photocatalytic Water Splitting with Ta and V Doped 2D Niobate Perovskites M. Tugrul AVCU	06_1078
17:30	High Energy Density Electrodes as Components of Lithium-Ion Batteries Lars REBOHLE	07_1104
17:30	Facile Synthesis of Copper Oxide Decorated Graphitic Carbon Nitride for Removal of Chemical Pollutant - Bisphenol A Sudarshan SARKAR	08_125
17:30	Sonochemical Synthesis of Cobalt-Doped BaTiO ₃ Nanoparticles for Enhanced Visible-Light Photocatalysis Ziba DARGAHI	09_1280

17:30	Template-Directed Synthesis of In ₂ O ₃ -SnO ₂ Nanowire Composites for Volatile Organic Compound Detection Przemyslaw PULA	11_1447
17:30	Bioinspired Filter with MOF Coating for Enhanced Microplastic Capture and Dye Removal Jooran KIM	12_1678
17:30	Optimizing Yb ³⁺ /Er ³⁺ ratio in oxyfluorophosphate glass for solar cell upconversion efficiency Najla ALMULHEM	13_197
17:30	Highly Selective Photoelectrochemical Glycerol Valorization towards Lactic Acid with Low-Valence Bimetallic Overlayer on CuWO ₂ Jaekyum KIM	14_202
17:30	TiO ₂ Phase Engineering by Millisecond Range Annealing for Highly Efficient Photocatalysis Shengqiang ZHOU	15_203
17:30	Light, heat, action! ZnCdO:Eu for ultrafast broadband photodetection enhanced with pyro-phototronic effect Igor PERLIKOWSKI	16_225
17:30	PtNi Alloy Supported on Oxygen Vacancy-Rich Black TiO ₂ for Enhanced Hydrogen Evolution in Acidic and Alkaline Media Jeonghun HAN	17_263
17:30	Oxidative dehydrogenation of alkane to ethylene via solid oxide cells with Pr _{0.1} Sr _{2.9} Fe _{1.7} Ni _{0.3} O _{3-δ} metal oxide electrode Youmin GUO	18_312
17:30	Synergistic Bi ₂ MoO ₇ /CaFe ₂ O ₄ Heterostructure with Accelerated Charge Dynamics for Enhanced Photoelectrochemical Efficiency Archita KAR	19_318
17:30	Piezocatalytic Decomposition of Malachite Green Using Hydrothermally Synthesized NiFe ₂ O ₄ Nanoparticles Xinyu JIN	20_380
17:30	Flash-Lamp-Annealing of Titanium Oxide Films Produced by Oblique-Angle Deposition: Photocatalytic Properties Raul GAGO	21_429
17:30	Understanding the incorporation and compensatory doping processes of Cu into ZnO nanowires Manuel Marcos MANRIQUE REYES	22_522
17:30	Source Substitution for Synthesis of Iron Compounds for Selenate Removal from Wastewater Upasana JHARIYA	23_563

17:30	Size Reduction and Confinement in p-type Transparent Conducting Oxides Ciarán COOLING	24_569
17:30	Conductivity of sputtered Al-doped ZnO modulates area selective deposition of Cu and Cu ₂ O David HORWAT	25_596
17:30	ALD Grown ZnMgO:Al on Si for Photovoltaic Applications: Effect of High Mg Alloying and Al Doping Ramon SCHIFANO	26_648
17:30	Enhanced Magnetocaloric Response in Gd ₂ CrMnO ₇ Double Perovskite for Cryogenic Cooling Applications Meenakshi MEENAKSHI	27_686
17:30	Low-Emissivity ZnO-Ag-ZnO Glass Coatings Activated by ms-range Flash-Lamp Annealing Guoxiu ZHANG	28_773
17:30	Electrodeposited WO ₃ Thin Films as a Photoanode for Photoelectrochemical Water Splitting Gamze ATAĞ	29_893
17:30	Stabilizing High-Valent Mn Single Atoms on Defect-Rich CeO ₂ Nanoparticles to Enhance N ₂ Selectivity and SO ₂ Resistance in Ultra-Low-Temperature NH ₃ -SCR Process Fei Bin WEI	30_96

Tuesday, 16 September 2025

PHOTOCATALYTIC MATERIALS III

U05

09:00	Upcycling Solid Waste into Metal Oxide Electrocatalysts for Catalytic Valorization of Waste-Derived Molecules Yan CHEN	218
09:30	Pseudobrookite Nanopowder Synthesized via Coprecipitation for Efficient Heavy Metal Removal from Wastewater Yahya SORKHE	1433
09:45	Mutual electronic interaction between zinc oxide and metal phthalocyanines: a class-dependent interaction Sakineh AKBARI NIA	1152
10:00	Self-Assembled CuO-Cu ₂ SnO ₄ Nanostructured Mesh for Sunlight-Driven Dye Degradation and Rapid Oil-Water Separation Oon Jew LEE	609

10:15	A systematic growth optimisation procedure for spray pyrolysis grown zinc tin oxide Ciarán COOLING	574
10:30	Coffee break	

PHOTOCATALYTIC MATERIALS IV		U06
11:00	Ultrafast laser processed transition metal oxides for photocatalysis and energy storage Belen SOTILLO	850
11:30	Single-step deposition of MoOx by High Pressure Sputtering for sustainable photovoltaic applications Rafael BENÍTEZ FERNÁNDEZ	421
11:45	Sol_Gel VO2 Films obtained by ns Pulsed Laser Annealing as Selective Chemoresistive and Optical H2 Gas Sensors Maria BASSO	274
12:00	Laser-Assisted Low-Temperature RF Magnetron Sputtering of Epitaxial α -Ga ₂ O ₃ Thin Films for Power and UV Electronics Yoon-Young HUH	956
12:15	Ultra-Thin Titanium Oxynitride Interlayers for Enhanced Charge Injection in n-Si/NiOx Photoanodes Giorgia MALANO	518
12:30	Lunch	

METAL OXIDES FOR OPTOELECTRONICS II		U07
14:00	Epitaxial Intercalation of Muscovite Ying-Hao CHU	1487
14:30	Enhancing Output Performance of Flexible Hybrid Nanogenerators via Micro-Pyramidal BaTiO ₃ -PDMS Surface Structuring for Wearable Electronics Gwangseop LEE	948
14:45	NIR-Assisted Drying for Enhanced Electrical and Optical Properties of AgNW Networks on DC Magnetron Sputtered Al-Doped ZnO Transparent Conductive Films Un-Tae KIM	674

15:00	Investigating Reconstructions and Photocatalysis of Thermally Reduced LiNbO ₃ (0001) Surfaces Marta MACYK	1099
15:15	Improving the long-term stability of new-generation perovskite-based TCOs using binary and ternary oxides capping layers Moussa MEZHOUD	1165
15:30	Coffee break	

PROPERTIES AND APPLICATION OF Ga₂O₃

U08

16:00	Defect Engineering of Metal Oxide Nanostructures Using Ion Beams Katharina LORENZ	820
16:30	Optical and structural characterization of Ga ₂ O ₃ thin films deposited by reactive and non-reactive sputtering Marcell GAJDICS	12
16:45	Core Shell ZnO-Ga ₂ O ₃ Nanowire Heterostructures for Piezoelectric Devices Emilien LEFEBVRE	1042
17:00	Phase transformation as a strategy to engineer the optical properties of RE-doped lanthanum vanadate nanoparticles Oksana CHUKOVA	1257
17:15	Sequential infiltration synthesis of Al ₂ O ₃ in PS-PMMA lamellar structures with low periodicity for sub 10 nm lithographic applications Francesco BIGNOLI	1627

POSTER SESSION 2

UP02

17:30	All-Transparent TFTs fabrication of Amorphous IZTO for high efficiency transparent device Myungjin JANG	01_1007
17:30	Design of a Reaction-Tracking Framework for ALD Process Control Using In-situ QMS: Case Study of Ga ₂ O ₃ Thin Films Ae Rim CHOI	02_1122
17:30	Electrical properties of CuI/ZnO heterojunctions Stanislav TIAGULSKYI	03_1239

17:30	Understanding the missing superconductivity in $\text{La}_{0.77}\text{Ca}_{0.23}\text{NiO}_2$ infinite layer Aimane CHEIKH	04_1351
17:30	Combined DFT and SCAPS-1D Investigation of Doped SnO as a Hole Transport Layer for Lead-Free Perovskite Solar Cells Faycal DJEFFAL	05_1426
17:30	Unveiling Bi-doping induced structural and optical evolution in $\gamma\text{-Ga}_2\text{O}_3$: a combined experimental and first-principles study Wen WANG	06_1643
17:30	High-Quality Heteroepitaxial Growth of $\gamma\text{-Ga}_2\text{O}_3$ Thin Films on Si (111) Substrates for Self-Powered Solar-Blind Photodetectors Tingting WANG	07_1645
17:30	Hyperbolic-to-hyperbolic polaritonic transition in low-symmetry crystals Chunqi ZHENG	08_1649
17:30	Enhancing UV-photoluminescence in reactively sputtered Cu_2O thin films via plasmonic layer integration for optoelectronic applications Chinmoy RAJAK	09_1733
17:30	Investigation of Electrical and Optical properties of CVD grown $\text{MoS}_2(1-x)\text{Se}_2x$ Kamini BHARTI	10_1739
17:30	SHI-Induced Thermal Stress and Its Role in Au Nanocluster-Nanoring Density Upsurge Shivani CHAUDHARY	11_1747
17:30	Thin transparent conductive oxide (TCO) layers applied to extensive surfaces for use in electromagnetic shielding applications Valentin ION	12_1816
17:30	Enhanced Surface Blistering Efficiency of H^+ Implanted Lithium Tantalate by Chemical Reduction Modification Limin WAN	13_295
17:30	Plasmonic Disruption: Interaction of Metallic Nanoparticles with Oxide-based Self-powered Photodetectors Adrian KAIM	14_362
17:30	On the effective mass, Burstein-Moss shift, and bandgap narrowing in degenerate Al-doped ZnO: Experimental and DFT insights Shreelekha MISHRA	15_374
17:30	Functionalisation of metal oxides by milliseconds range flash lamp annealing Slawomir PRUCNAL	16_383

17:30	The Role of Crystal Orientation and Annealing in Tuning Defect Structures and Luminescence in Ga_2O_3 :RE Systems Renata RATAJCZAK	17_433
17:30	Controlling the Insulator-to-Metal Transition in VO_x Thin Films through Tailored Magnetron Sputtering Deposition Conditions Jérémie GONCALVES	18_508
17:30	Deposition of AZO thin Films by High-Pressure Sputtering: Influence of H_2/Ar and O_2/Ar gas mixtures on Optical and Electrical Properties. Sebastián DUARTE-CANO	19_550
17:30	Effects of Water Exposure Duration and Temperature on the Performance of Solution-Processed a-IGZO TFTs Giyoong CHUNG	20_739
17:30	Light Extraction Enhancement in Top-Emitting QLEDs Using Solution-Processed High Refractive Index Nanoparticle Layers Hyunsun KIM	21_74
17:30	The use of impedance spectroscopy to study the properties of powder materials of various origins Barbara SOLECKA	22_838
17:30	“Development and Photoluminescence Analysis of High-Efficiency Vanadium Oxide Nanorods for Advanced Photodetector Applications” Pawan KUMAR	23_880
17:30	Understanding the Atomic-Scale Origins of Interface States in Crystalline and Amorphous $\text{Al}_2\text{O}_3/\text{GaN}$ Interfaces Marouane AMMAR	24_913
17:30	Effect of flash lamp annealing on electrical and optical properties of Ti-Al co-doped ZnO films deposited by DC magnetron sputtering Mingyu KIM	25_963
17:30	Sol-gel preparation of Ga_2O_3 :Sb Thin-Films with varying surfactant concentration and composition Luiz PEDRINI	26_972
17:30	Stable and High-Performance SnO_2 Thin-Film Transistors Enabled by Sol-Gel-processed Ga_2O_3 Passivation Layers Suhyeon CHOI	27_975
17:30	AgxTe Nanoparticle-based CRS RRAM devices with Improved Uniformity by Suppressing Nanoparticle Aggregation Jongmin YOON	28_976
17:30	Growth of n-ZnO Nanowires Doped with Group III Elements via Vapor Transport Deposition Jeongmin LEE	29_977

17:30

Top Electrode Effect on Memory Characteristics of AgxTe Nanoparticle-based CRS RRAM devices
Kim TAESU

30_989

Wednesday, 17 September 2025

9:00

PLENARY SESSION

12:30

Lunch

FUNCTIONAL OXIDES I

U09

14:00

Defects in functional oxides probed by positron annihilation spectroscopy
Maciej Oskar LIEDKE

325

14:30

Defect Modification in AZO Thin Films Induced by Single Femtosecond Laser Pulses: A Multi-Spectral Micro-photoluminescence Study
Haotian XU

409

14:45

Opto-electronic properties of co-sputtered amorphous ITO-ZnO mixed oxide-based transparent conducting films
Shuvaraj GHOSH

678

15:00

Eu-Doped ZnMgO-Based Short-Period Multi-Quantum Well Structures
Adrian KOZANECKI

468

15:15

Defect modeling and damage buildup in ion-bombarded metal oxides
Przemyslaw JÓZWIK

382

15:30

Coffee break

ANTIMONY CHALCOGENIDES I

U10

16:00

Atomic Displacement Effects in X-ray Scattering of Implanted γ -Ga₂O₃, γ -MoO₃, and in Oxide Quantum Heterostructures: Advances Using the MROX Software
Sergio MAGALHAES

489

16:30

Structural evolution of TiO₂ during stoichiometry restoration after reduction
Franciszek KROK

1198

16:45	Analysis of UO ₂ /Ga ₂ O ₃ structural spectra using Wavelet Transform based method Kazimierz SKROBAS	1067
17:00	Laser-Induced MgAl-Layered Double Hydroxides/Graphene In situ Growth on Waste-Cellulose-Derived Membrane for Ultra-efficient Removing Phosphate from Wastewater Yi-Ting LAI	112
17:15	Multifunctional TCOs: A combinatorial study on In-Zn-O thin films as transparent electrically conductive Cu diffusion barriers Stefanie FRICK	1309
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

FUNCTIONAL OXIDES III		U11
09:00	Chemistry of innovative materials for sustainable integrated devices on silicon Adrian CARRETERO GENEVRIER	721
09:30	Performance enhancement of piezoelectric nanogenerators based on ZnO/Al ₂ O ₃ core-shell heterostructures Manuel Marcos MANRIQUE REYES	524
09:45	Development of Self-Cleaning Rubber Composite Using Fe-Doped TiO ₂ Photocatalysts Activated by Visible Light Jooran KIM	1677
10:00	Novel Low-emissivity Coating for Smart Windows Made of ALD-grown Al-delta-doped ZnO Superlattices Guoxiu ZHANG	771
10:15	Advanced strategies for tailoring transparency window in Correlated Transparent Conductors Aimane CHEIKH	910
10:30	Coffee break	

FUNCTIONAL OXIDES IV

U12

11:00	DFT and experimental study of acceptor states in oxides, influence of strain and surface proximity Oksana VOLNIANSKA	658
11:30	Branch points in ZnO and MgO Ramon SCHIFANO	662
11:45	Nanoprobe-based approach for electrical characterization of semiconductor nanostructures Stanislav TIAGULSKYI	1224
12:00	Deposition and characterization of spinel IGZO and spinel IZO thin films Evangelos AGIANNIS	117
12:15	Effect of flash lamp annealing on electrical and optical properties of Ti-Al co-doped ZnO films deposited by DC magnetron sputtering Mingyu KIM	226
12:30	Lunch	



Symposium Sponsors



Symposium V

Sessions: Room 309 | Main Building

Poster Sessions: 237 (Small Hall) | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

INTEGRATION OF ADVANCED MATERIALS ON SILICON: FROM CLASSICAL TO NEUROMORPHIC AND QUANTUM APPLICATIONS

Symposium organizers:

Andrea **DE IACOVO**

– Roma Tre University

Costanza Lucia **MANGANELLI**

– IHP – Leibniz Institute for High Performance Microelectronics

Karoline **STOLZE**
(Main Organizer)

– Leibniz-Institut für Kristallzüchtung

Ross **MILLAR**

– University of Glasgow

Monday, 15 September 2025

	SiGe I	V01
09:15	Isotope- and strain-engineered germanium quantum wells Simone ASSALI	1101
09:45	High-Gain, Low-Excess Noise Ge-on-Si Short-Wave Infrared Avalanche Photodiodes Linear Arrays Jaroslav KIRDODA	1830
10:00	Thickness and annealing interplay on the structural and thermal properties of Ge Virtual Substrates Agnieszka CORLEY-WICIAK	1363
10:15	UV-nanosecond laser melting on in-situ P-doped Ge-on-Si and SiGe-on-Si epitaxial layers grown by LEPECVD Giulia Maria SPATARO	810
10:30	Coffee break	

	DEVICES FOR QUANTUM APPLICATIONS	V02
11:00	Ge-based platform for hosting spin qubits Nikolay PETKOV	406
11:30	Impact of gate dielectrics on 2D electron gas transport in Si/SiGe heterostructures Alberto MISTRONI	1200
11:45	Temperature-dependent Electronic Transport in Multi-Gate Ge/Sn and SiGeSn Schottky Barrier Field Effect Transistors Masiar SISTANI	875
12:00	Contact engineering in strained SiGe/Si heterostructures for quantum computing applications operating at cryogenic temperatures fabricated by phosphorus ion implantation Fabian FIDORRA	513
12:15	Single spin conveyor-belt shuttling in Si/SiGe for material analysis Lars SCHREIBER	655
12:30	Lunch	

SiGe II

V03

14:00	Ge/SiGe Quantum Well Heterostructures for Advanced Mid-Infrared Photonics Stefano CALCATERRA	1266
14:30	Effects of annealing temperature on photoluminescence properties of germanium multiple quantum wells Diana RYZHAK	1620
14:45	GeSnOI electrically driven technology Moustapha EL KURDI	764
15:00	Forward/Reverse Ge-rich SiGe graded layers for mid-infrared integrated photonics Jacopo FRIGERIO	825
15:30	Coffee break	

LIGHT DETECTION & SENSING

V04

16:00	Towards a CMOS compatible refractive index sensor Inga Anita FISCHER	1313
16:30	Biological transistor (bioFET) for the specific and label-free sensing of CRP in unprocessed blood Shubham BABBAR	1668
16:45	Effect of Silicon Nanowire Moth-Eye Structures on Reflectance Reduction Koki SHIRAKAWA	931
17:00	Lateral GeSn p-i-n waveguide photodetectors covering eiture short-wave infrared band Ting-Yu CHEN	947
17:15	Machine-Learning Assisted Imaging and Crack Detection of Wafer Features using Cavity-Enhanced Upconversion Nanoparticles and Si camera Dileep KOTTILIL	

POSTER SESSION 1

VP01

17:30	Unraveling the Ion-mediated Conductance Modulation in Electrolyte-gated Transistors with Fluorinated Interfaces for Neuromorphic Applications Yeonseo KIM	01_1000
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17:30	Porous PVDF-HFP Interlayer for Ion-Gated Synaptic Transistors with Enhanced Retention and Reservoir Computing System Jiyeon KIM	02_1161
17:30	Preparation and characterisation of transfer printable III-V dies for hetero-integration on silicon Isabella PERACCHI	03_1252
17:30	Towards ultra-low gate capacitance in GaN-HEMTs via airgap approach using SF ₆ Plasma Etching and Al ₂ O ₃ /SiN/AlN Stack Simon ST-JACQUES	04_1260
17:30	Organic Field Effect Transistors Based on Doped Conjugated Polymers for Neuromorphic Applications Jae Eun KIM	05_1269
17:30	Effects of asymmetry, interface dipoles and magnetoelectric coupling on the performance of La _{0.7} Sr _{0.3} MnO ₃ /BiFeO ₃ /Au ferroelectric tunnel junction Neculai PLUGARU	06_1525
17:30	Impact of Growth Time on the Morphology and Defect Formation of Epitaxial GaAs Islands on CMOS-Compatible Si Nanotips Adriana RODRIGUES	07_1608
17:30	Rapid Dynamics of VO ₂ Switching Devices for Neuromorphic Applications Amir GILDOR	08_179
17:30	Multi-Gas Photoacoustic Environmental Sensor: calibration in air for five representative gases Maeva DORON	09_390
17:30	Revealing Dopant-Structure-Process Interplay in Tetravalently Doped Hf _x Zr _{1-x} O ₂ : Toward Rational Design of High-Performance Ferroelectric Thin Films Jihye PARK	10_775
17:30	Optimization of Pulsed Laser Deposited Hf _x Zr _{1-x} O ₂ Thin Films: Effects of Trivalent Dopants and Substrate Variation Soo Jin JUNG	11_861
17:30	Controlling the resistive switching characteristics of a-IGZO-based resistive memory via hydrogen ion doping Hee Yeon NOH	12_937
17:30	Comparative study of rapid thermal and microwave annealing on compressively-strained ultra-doped GeSn alloys on silicon Ruei-Jhang WANG	13_944
17:30	Laser-Induced Synthesis of ATM-Based Multilayer MoS ₂ for Logic Device Applications: A Crystallinity Enhancement Approach Hyehyeon PARK	14_968

Tuesday, 16 September 2025

2D MATERIALS ON Si

V05

08:45	Van der Waals epitaxy and ferroelectric properties of quasi-2D (GeTe) _m (Sb ₂ Te ₃) _n layered alloys on silicon Stefano CECCHI	1241
09:15	Localised metal-MoS2 intermixing by pulsed laser annealing for low resistance contacts - tackling a grand challenge for MoS2 devices Pavlina METAXA	552
09:45	Enhanced Synaptic Behavior in MoSe2 Three-Terminal Neuromorphic Devices Using ALD-Grown Al2O3 Gate Dielectric Tamkeen FAROOQ	998
10:00	Integration of Graphene with III-V Semiconductors for Next-Generation Reconfigurable Electronic Devices Luca ANZI	1628
10:15	Brillouin light scattering of acoustoplasmonic nanomembranes Anuj Kumar DHIMAN	1845
10:30	Coffee break	

SiGeSn

V06

11:00	Raman spectroscopy of SiGeSn alloys for thermal and vibrational properties Davide SPIRITO	145
11:30	On the impact of mechanical constraint on band structure and photo-elastic effect in photonic resonators Jon SCHLIPF	1083
11:45	Temperature-dependent performance of a GeSn thermophotovoltaic cell Ignatii ZAITSEV	413
12:00	Topological lasing based on direct bandgap Ge _{1-x} Sn _x photonic crystals Ian COLOMBO	1080
12:30	Lunch	

NEUROMORPHIC DEVICES

V07

14:00	Directional spiking in integrated photonic neurons via non-Hermitian microrings Stefano BIASI	1106
14:30	HZO-Enhanced Schottky Barrier FETs for Neuromorphic Computing Viktor WAHLER	1221
14:45	Interface Dipole Engineering in Silicon-Integrated IGZO/HZO FeFETs for Neuromorphic Applications Wangseop LIM	234
15:00	All Optical Controlled Neuromorphic FET Based on Ferroelectric/Semiconductor Heterostructure Anurag GHOSH	35
15:15	Charge Transport and Noise in PVP-Coated Silver Nanowire Networks: Implications for Neuromorphic Applications Charu SINGH	521
15:30	Coffee break	

III-V ON SI

V08

16:00	Monolithic Integration of III-V on silicon for photonic and electronic applications Fariba HATAMI	1195
16:30	Photoluminescence and structural properties of monolithically integrated GaAsP islands on Si(001) nanotips wafer Hanna ILLNER	1618
16:45	Impact of structural defects on the electrical and optical properties in Indium Phosphide (InP) nanowires Vihar GEORGIEV	1574
17:00	Micro-transfer printing for heterogeneous integration on silicon photonics Gunther ROELKENS	150

Wednesday, 17 September 2025

9:00 PLENARY SESSION

12:30 Lunch

WORKSHOP - LASTSTEP EUROPEAN PROJECT I V09

14:00	Exploring the potential of GeSn alloys for efficient mid-IR light sources Alexei CHELNOKOV	1362
14:30	(LASTSTEP European Project) Epitaxy of intrinsic and in-situ doped GeSn/SiGeSn heterostructures for mid infra-red optoelectronics Jean-Michel HARTMANN	365
14:45	[LASTSTEP European Project] Process integration and nanofabrication strategies for next-generation GeSn technologies Nicolas PAUC	363
15:00	New light on light emitters: the lattice strain and composition fluctuation in GeSn devices investigated at the nanoscale Giovanni CAPELLINI	252
15:30	Coffee break	

WORKSHOP - LASTSTEP EUROPEAN PROJECT II V10

16:00	MBE growth of strain-relaxed GeSn film on Si via Sn-composition gradient buffer for mid-infrared photodetectors Guo-En CHANG	776
16:30	Monolithic integration of GeSn photodetectors on silicon platforms (LASTSTEP European Project) V. REBOUD	1320
16:45	Exploring the properties and performance of GeSn alloys and devices using high pressure and low temperature techniques (LASTSTEP workshop) Stephen SWEENEY	862
17:10	GeSn Semiconductors: The Road Ahead and Emerging Opportunities Oussama MOUTANABBIR	1177

18:00 YOUNG RESEARCHER AWARDS CEREMONY

18:30 SOCIAL EVENT

Thursday, 18 September 2025

NANOIC PILOT LINE WORKSHOP I (JOINT SESSION WITH SYMP. Q) V11

09:00	NanoIC pilot line – addressing sub 2nm leading edge technologies Inge ASSELBERGHS	726
09:30	Integrating Emerging Materials into Advanced ICs: Tyndall's Role in the NanoIC Pilot Line Niamh WALDRON	591
10:00	Si/SiGe/Si double heterostructure diodes: a promising approach to pseudomorphic lasers for the Si material system Moritz BREHM	1896
10:15	Epitaxy of Ge/SiGe 2D hole gases for quantum electronics Jean-Michel HARTMANN	1897
10:30	Coffee break	

NANOIC PILOT LINE WORKSHOP II (JOINT SESSION WITH SYMP. Q) V12

11:00	New semiconductor channel materials for advanced nanotechnologies Pierre MORIN	1212
11:30	Cryo-FIB sample preparation for advanced sub-nanometer S/TEM semiconductor devices metrology Iulian BOERASU	1406
12:00	Hydrogen-Free PVD SiN For Low Loss Waveguides On 300 mm Silicon Platform Eleonora GARONI	444
12:15	Si/SiGe epitaxial multi-stacks on SOI for CFET devices Anjani AKULA	1395



Symposium Sponsor



Symposium W

Sessions: Room 437a | Main Building

Poster Sessions: 237 (Small Hall) | Main Building

ELECTRONIC, PHOTONIC, NANO, LOW-DIMENSIONAL AND QUANTUM MATERIALS

DEFECT-INDUCED EFFECTS IN LOW-DIMENSIONAL AND NOVEL MATERIALS

Symposium organizers:

Daesung **PARK**

Elżbieta **GUZIEWICZ**

Nikolai A. **SOBOLEV**

Shengqiang **ZHOU**

- Technical University of Denmark
- Institute of Physics - Polish Academy of Sciences
- Universidade de Aveiro
- Helmholtz-Zentrum Dresden-Rossendorf

Monday, 15 September 2025

OXIDE FILMS AND MEMBRANES I W01

09:00	Induced piezoelectricity in fluorite-type oxides Paul MURALT	1461
09:30	Tunable Pyroelectricity in Epitaxial Fluorite Oxide Films Alessandro PALLIOTTO	1024
09:45	Oxygen Vacancy Effect on the Sub-Cycling Behavior of HfZrOx-based Ferroelectric Capacitor Pin-Jiun WU	871
10:00	Electrostriction in oxygen-deficient materials Pierre-Eymeric JANOLIN	367
10:30	Coffee break	

DEFECTS CHARACTERIZATION W02

11:00	New in situ isotope exchange Raman spectroscopy (IERS) methodologies for measuring oxygen defect transport kinetics Monica BURRIEL	1210
11:30	Defect and Crack Evolution Induced by H ⁺ and He ⁺ Implantation during the Crystal Ion Slicing of Single-Crystal LiTaO ₃ Limin WAN	296
11:45	Optimizing GaN Surface Morphology Through Controlled Photo-Electroless Etching for Enhanced Optical Properties Antouman SALLAH	206
12:00	Visualizing solid-state amorphization in ferroelectric In ₂ Se ₃ through in situ electron microscopy Pavan NUKALA	1854

OXIDE FILMS AND MEMBRANES II

W03

14:00	Redefining Material Design: The Impact of Freestanding Oxide Membranes Nini PRYDS	385
14:30	Epitaxial Growth and Strain Engineering of Freestanding La _{0.7} Sr _{0.3} MnO ₃ Membranes Eric BRAND	930
14:45	High-quality SrTiO ₃ membranes through optimized release strategies Christina HGOFELDT	1624
15:00	Defects, strain and interface control in single crystalline complex oxide membranes Mariona COLL	657
15:30	Coffee break	

QUANTUM TECHNOLOGY

W04

16:00	Engineering spin defects in 2D materials using mega-electron volt focused ion beams Andrew BETTIOL	992
16:30	Quantum imaging of vortex stray fields in a permalloy disk using spin defects in hexagonal boron nitride Peiting WEN	1040
16:45	Coupled atomistic simulations for the design of solid-state quantum devices Antonino LA MAGNA	1779
17:00	Photoluminescenc investigation of the silicon vacancy defect in 4H-SiC relevant for quantum metrologies Shyama RATH	1319
17:15	Stress-Induced Defect Formation in Hexagonal Boron Nitride for High-Yield Quantum Emission Sofiya KARANKOVA	111

POSTER SESSION 1 WP01

17:30	Defects and Functional Behavior in Black Tourmaline (Schorl) Thin Films Deposited by E-Beam and Sputtering Marina SPARVOLI	01_1138
17:30	Negative photoconductivity and ferroelectricity in non-stoichiometric CVD grown ReS ₂ films Sakshi GARG	02_1225
17:30	Microstructural properties of ion-implanted GaAs/AlGaAs core-shell nanowires Yuxuan SUN	03_1250
17:30	Engineering the point defects in ZnO nanowires using thermal annealing and H plasma treatments Emilien LEFEBVRE	04_1306
17:30	Template-Assisted Synthesis and Structural Characterization of Unconventional 4H-HCP/FCC Phase Au@Pd Core-Shell Nanoribbons Abhijit ROY	05_1463
17:30	Effects of Surface Roughness and Doping Non-Uniformity in efficiency of Chemically Thinned Silicon PIN Diodes Marina SPARVOLI	06_1471
17:30	Cluster induced superconductivity in Ga-Doped SiGe via Ion Implantation and Flash-Lamp Annealing Yu CHENG	07_1580
17:30	Metal-Insulator Transition via Ion Irradiation in Epitaxial La _{0.7} Sr _{0.3} MnO ₃ - Thin Films Shengqiang ZHOU	08_193
17:30	CMOS-compatible electrically driven single-photon sources operating at the telecommunication wavelengths Alessandro PUDDU	09_461
17:30	Doping of two-dimensional monolayers by ion implantation Slawomir PRUCNAL	10_495
17:30	On the synthesis of stacked single crystalline freestanding membranes Longyi FAN	11_714
17:30	Computational modelling to study the effect of intrinsic defect on halide ion migration in Lead-Iodide perovskite Pranjul Chandra BHATT	12_749

17:30	Defect induced magnetic phase transition in CrSBr Shengqiang ZHOU	13_833
17:30	DFT study of structural and electronic effects of oxygen vacancies at La0.7Sr0.3MnO3/BaTiO3/BaSnO3 (001) interfaces Rodica PLUGARU	14_908

Tuesday, 16 September 2025

FIRST-PRINCIPLES CALCULATION AND MACHINE LEARNING I
 W05

09:00	Alloy engineering for tailoring magnetic properties in van der Waals crystals Magdalena POPIELSKA (BIROWSKA)	1088
09:30	Ab initio modeling of defects in hexagonal-diamond silicon Michele AMATO	638
09:45	From Mononitride to Pernitride: Defect-Structure-Property Relationships in CrN-Based Materials Barsha BHATTACHARJEE	396
10:00	Band Offsets and Defect Properties in α -Ga ₂ O ₃ -Based Alloys: First-Principles Insights Mohamed Abdelilah FADLA	1090
10:15	A Phase-Field Gradient Approach for Antiferroelectrics with Localized Point Defects Dilshod DURDIEV	152
10:30	Coffee break	

ATOMIC-SCALE VISUALIZATION
 W06

11:00	Understanding Defect Dynamics in 2D Mo(X)2 by Scanning Transmission Electron Microscopy Paulo FERREIRA	1887
11:30	A direct observation of phase transformation in defective MoSe2 within a vdW heterostructure, induced by electron beam irradiation Hanako OKUNO	1396

11:45	Oxide precipitates characterization in High Resistivity industrial silicon wafers using micro-photoluminescence imaging and Deep Level Transient Spectroscopy Jérémi CROZELON	532
12:00	Defects in quantum materials: first-principles material design Arthur ERNST	
12:30	Lunch	

MATERIALS FOR ENERGY AND ENVIROMENT

W07

14:00	Enhanced performance of (Photo)electrocatalytic nanomaterials through introducing defect by ion beam Ren FENG	353
14:30	Shell effects and free-electrons in electromigrated oxidized Cu-nanocontacts Regina HOFFMANN-VOGEL	270
14:45	Investigation of gallium oxide thin films deposited by sputtering for photomemristor applications Marina SPARVOLI	941
15:00	Induced defects in high-entropy materials and their effects Wenyi HUO	925
15:30	Coffee break	

2D AND 1D MATERIALS I

W08

16:00	vdW Integrated Ideal Interfaces for High Performance Optoelectronic Devices Laiyuan WANG	1501
16:30	Controllable Synthesis of Ti ₂ C ₂ MXene and New Insights on Its Gas Sensing Mechanism Danyao QU	314
16:45	Investigation of defect evolution in few layer WSe ₂ by Ion beam irradiation Madhuri CHENNUR	1190

17:00	Nature of spinons in the 1D spin chains Teresa KULKA	1136
17:15	Novel Ga ₂ O ₃ Monolayer as a Promising Material for Gas Sensing and Scavenging Applications: A First-Principles Study Afreen ANAMUL HAQUE	1322

Wednesday, 17 September 2025

9:00 **PLENARY SESSION**

12:30 Lunch

OXIDE FILMS AND MEMBRANES III **W09**

14:00	Topological polar textures in ferroelectric nanostructures Dong Jik KIM	812
14:30	Topographical patterns in La _{0.7} Sr _{0.3} MnO ₃ single crystalline membranes Martí RAMIS GARCÍA	713
14:45	Shallow Donor Defect-Controlled Conduction Mechanisms in ZnMgO: Influence of Magnesium Content on Temperature-Dependent Electrical Conductivity Krishna Rajendra LONE	505
15:00	The enhancement of p-type conductivity in ZnO thin films by defect engineering Slawomir PRUCNAL	460
15:30	Coffee break	

ELECTRONICS AND OPOELECTRONICS **W10**

16:00	Turning Negative into Positive: Traps and Trapping Phenomena in Charge-Trapping Non-Volatile Memories. Albena PASKALEVA	985
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16:30	Study of the behavior of graphene-based memristors in a circuit emulating neuronal membrane Marina SPARVOLI	326
16:45	Photonic Potential Modulation Through Engineered Topological Defects in Chiral Nematic Liquid Crystal Microcavities Joanna MEDRZYCKA	1639
17:00	Tuning Optical Emission of ZnO Nanoparticles Synthesized via Microwave-Assisted Hydrothermal Method through Chemical Reagent Selection. Julita ROSOWSKA	1483
17:15	Interface Spin-orbit Coupling Induces Ferromagnetic Insulator at Room Temperature Yuhao HONG	1610
18:00	YOUNG RESEARCHER AWARDS CEREMONY	
18:30	SOCIAL EVENT	

Thursday, 18 September 2025

FIRST PRINCIPLES CALCULATION AND MACHINE LEARNING II

W11

09:00	Exploring Moiré Oxide Interfaces through First-Principles and Machine-Learning Techniques Juan Maria GARCÍA-LASTRA	1855
09:30	Composition-Dependent Properties of Mo _{1-x} W _x S ₂ Monolayers: A First-Principles Study Maciej SZYSZKO	1817
09:45	QM/MM Investigations of Defects in MgO and Their Use as a Model System for High-T _c Superconductivity Liam MORGAN	228
10:00	Electron-phonon coupling at interfaces and grain boundaries from first principles calculations Miguel PRUNEDA	679
10:30	Coffee break	