

# 2<sup>nd</sup> Euro-Mediterranean Conference on Materials, Devices and Systems



Laboratoire de Recherche  
en Sciences et Ingénierie  
**LaRSI**  
مختبر البحث في العلوم والهندسة

<https://emcm-ds25.sciencesconf.org/>

**21-23 April 2025, Fez, Morocco**



**FST - ENSA - ENS**

# PROGRAMME

## Objectives

- Gather researchers in the Euro-Mediterranean area to share research experiences from materials to devices and complex and smart electronic systems.
- Debate on new challenges and enhance scientific and technological innovative advances towards computer science based on artificial intelligence.
- Promote and open new south-north collaborations and consortia on a large variety of research fields including materials, embedded electronics, sensors, environment, biomedicine, renewable energies...

## Main Topics

- Materials: semiconductors, compounds, 2D materials..
- Advanced Characterization
- Electronics, photonics and power devices
- Sensors for environment and health
- Renewable energies
- Integrated circuits and systems on chips
- Artificial Intelligence & Quantum Computing
- .....

\* All accepted papers will be indexed in Scopus (ongoing discussion), Best papers will be published in indexed Journals

## Keynote Speakers



Dr. Damien QUERLIOZ  
CNRS ,Univ. Paris Saclay  
(France)

Artificial  
Intelligence



Pr. Mourad TELMINI  
Univ. Tunis El Manar  
(Tunisia)

Quantum  
Computing



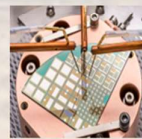
Dr. Hicham BOUZEKRI  
African Technical Advisors  
(Morocco)

Renewable  
Energies



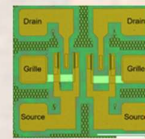
Dr. Paul HURLEY  
Tyndall National Institute  
(Ireland)

Interfaces Traps in III-V  
Electronic & Photonic Devices



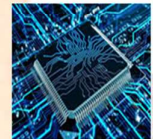
Dr. Pierre BROSELARD  
INSA Lyon  
(France)

Power  
Devices



Pr. Saïd HAMDIOUI  
TU Delft  
(Netherlands)

Age of Artificial  
Intelligence



## Location

Fez, spiritual capital of the kingdom of Morocco. Imperial and prestigious city of the Islamic world, many historical monuments, become universal heritage adorn the city whose medina is the most original and the most authentic of the kingdom. Open to the civilizations of the world, Fez is a city of the Middle Atlas, surrounded by mountains and extensive valleys that have in fact one of the most beautiful cities of Morocco. Traditions and cultural modernisms mix in peace and harmony. Its gastronomy, its calm and its warm welcome are all assets to lead reflections in serenity.

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## [Monday, April 21, 2025]

|                 |                                                                                                                                                                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [09:30 - 10:00] | [Registration]                                                                                                                                                                                                                            |
| [10:00 - 10:30] | [Welcome and Opening ceremony]                                                                                                                                                                                                            |
| [10:30 - 11:15] | [Plenary session 1: <b>Dr. Damien Querlioz</b> , Nanosciences and Nanotechnologies Center, Univ. Paris-Saclay, France, <i>In-Memory Computing: A Path to Energy-Efficient and Trustworthy Embedded AI</i> ]                               |
| [11:15 - 11:45] | Coffee break                                                                                                                                                                                                                              |
| [11:45 - 12:30] | [Plenary session 2: <b>Pr. Mourad Telmini</b> , Univ. Tunis El Manar, Tunisia, <i>Introduction to Quantum Computing</i> ]                                                                                                                 |
| [12:30 - 14:30] | Lunch                                                                                                                                                                                                                                     |
| [14:30 - 14:45] | [Plenary session 3: <b>Dr Hicham BOUZEKRI</b> , CEO African Technical Advisors, Morocco, <i>Morocco's green hydrogen opportunity</i> ]                                                                                                    |
| [14:45 - 15:45] | [Oral session 1: Nanobiotechnologies for health and environmental applications & Renewable Energies]                                                                                                                                      |
| 14:45 - 15:05   | <b>B. Lakssir</b> : Soil sensors tool using embedded AI toward precision agriculture                                                                                                                                                      |
| 15:05 - 15:25   | <b>A. Souifi et al.</b> : Low-Power Gas Sensors on CMOS for Air Quality Monitoring                                                                                                                                                        |
| 15:25 - 15:45   | <b>El Mouden Zahra</b> : Modeling and optimization of three-dimensional Y-shaped micro-mixers for best Microfluidic mixing efficiency                                                                                                     |
| 15:45 - 16:05   | <b>N. Arsalane et al.</b> : Simulation and Optimization of Smart Grid Energy Management Using 5G Networks: A Case Study with Adaptive Load Control and Renewable Energy Integration                                                       |
| [16:05 - 16:35] | Break - Poster Session 1: Renewable Energies                                                                                                                                                                                              |
|                 | <b>L. Dallali</b> : Optoelectronic properties of CsPbI <sub>3</sub> quantum dots                                                                                                                                                          |
|                 | <b>O. Britel</b> : Étude computationnelle des molécules $\pi$ -conjuguées à base de carbazole comme matériaux donneurs pour les cellules solaires organiques à hétérojonction en volume                                                   |
|                 | <b>F. Oubihi et al.</b> : High-Efficiency Tandem Solar Cells: Stacked Methylammonium Lead Halide Perovskite on Silicon Substrates                                                                                                         |
|                 | <b>D. Boumalik</b> : L'influence de milieu de culture BG11 sur le taux de croissance des microalgues SCENEDESMUS et CHLORELLA dans les mêmes conditions de culture pour une valorisation bioénergétique, industrielle et environnementale |
|                 | <b>A. Askouri</b> : Optimisation of specific energy consumption and brine utilisation for environmental protection                                                                                                                        |
| [16:35 - 18:05] | [Oral session 2: Géophysique et Génie Civil 1]                                                                                                                                                                                            |
| 16:35 - 16:55   | <b>A. Bajadi et al.</b> : Ciblage et analyse géologique des zones potentielles en cobalt dans le district minier de Bou Azzer : Apport des données aéromagnétiques, de la géochimie fluviatile et de l'analyse pétro-structurale          |
| 17:05 - 17:25   | <b>R. Et-tanteny et al.</b> : Clay-Based Biocomposites for Wastewater Treatment: Removal of Dyes and Heavy Metals                                                                                                                         |
| 17:25 - 17:45   | <b>M. Ettayeb et al.</b> : Comparison of Destructive and Non-Destructive Methods for Assessing Concrete Quality                                                                                                                           |
| 17:45 - 18:05   | <b>A. Azzouzi et al.</b> : Cotton Stalk Waste as a Sustainable Additive for Unfired Clay Bricks                                                                                                                                           |

## [Tuesday, April 22, 2025]

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| [09:00 - 09:45] | [Plenary session 4: <b>Pr Paul Hurley</b> , Tyndall National Institute, Cork, Ireland, <i>Interfaces Traps in III-V Electronic &amp; Photonic Devices</i> ]                                               |
| [09:45 - 10:45] | [Oral session 3: Synthesis and Characterization of Materials 1]                                                                                                                                           |
| 09:45 - 10:05   | <b>M. Besacier et al.:</b> <i>Dimensional metrology at the nanoscale</i>                                                                                                                                  |
| 10:05 - 10:25   | <b>K. Cherkaoui et al.:</b> <i>Defects at the HfO<sub>2</sub>/B-Ga<sub>2</sub>O<sub>3</sub>(-201) interface</i>                                                                                           |
| 10:25 - 10:45   | <b>K. Bahassan et al.:</b> <i>Structural and Dielectric study K<sub>x</sub> [Na]<sub>1-(1-x)</sub> NbO<sub>3</sub> _3 Ferroelectric Materials</i>                                                         |
| [10:45 - 11:30] | Break - Poster Session 2: Materials Synthesis                                                                                                                                                             |
|                 | <b>C. Naim:</b> <i>Enhancing Mechanical Performance of Sodium Silicate-Activated Binders: A Physicochemical and Structural Analysis of Micronized Clays from Two Moroccan Regions</i>                     |
|                 | <b>S. Fekkar et al.:</b> <i>Etude des propriétés thermiques et mécaniques d'un nouveau composite à base d'urée-formaldéhyde</i>                                                                           |
|                 | <b>Y. Elalaoui et al.:</b> <i>Investigations of electronic and optical properties of A<sub>2</sub>SnO<sub>3</sub> (A = K, Rb and Cs) perovskite oxides for the photovoltaic applications: A DFT study</i> |
|                 | <b>Y. Chegrane:</b> <i>Magnetic Behavior of VI<sub>3</sub> Bilayer</i>                                                                                                                                    |
|                 | <b>H. Mataich:</b> <i>Utilisation des matériaux intelligents pour surveiller et supprimer les vibrations dynamiques des plaques stratifiées</i>                                                           |
| [11:30 - 12:30] | [Oral session 4: Synthesis and Characterization of Materials 2]                                                                                                                                           |
| 11:30 - 11:50   | <b>A. Taleb:</b> <i>Advanced Nanostructured Materials for sensing applications</i>                                                                                                                        |
| 11:50 - 12:10   | <b>A. Azouaoui et al.:</b> <i>The study of physical properties of Li<sub>2</sub>N-layer</i>                                                                                                               |
| 12:10 - 12:30   | <b>S. Ait Elmakki et al.:</b> <i>The ferrimagnetic mixed spin Ising in trilayer nano-graphene structure</i>                                                                                               |
| [12:30 - 14:30] | Lunch                                                                                                                                                                                                     |
| [14:00 - 14:45] | [Plenary session 5 <b>Dr Pierre Brosselard</b> , Ampere Lab - National Institute of Applied Sciences, INSA Lyon, France, <i>State of the art on WBG and UWBG Power Semiconductor Devices</i> ]            |
| [14:45 - 15:45] | [Oral session 5: Physical properties of materials]                                                                                                                                                        |
| 14:45 - 15:05   | <b>F. Bougamha et al.:</b> <i>NMR investigation of magnetic correlations in low dimensional van der Waals T<sub>2</sub>P<sub>2</sub>S<sub>6</sub> (T = Mn &amp; Ni)</i>                                   |
| 15:05 - 15:25   | <b>A. Maouhoubi et al.:</b> <i>The Effect of Anisotropy and Magnetic Field on the Magnetic Behavior of a Lattice Formed by Alternating Layers</i>                                                         |
| 15:25 - 15:45   | <b>O. Sliman et al.:</b> <i>Impact of cooling rate on superconducting and pinning properties in deuterated κ-(ET)<sub>2</sub>Cu [N(CN)<sub>2</sub>]Br organic superconductor</i>                          |
| [15:45 - 16:15] | Break - Poster Session 3 : Dispositifs électroniques, optiques et photoniques et Capteurs                                                                                                                 |
|                 | <b>H. Jaoudari et al.:</b> <i>Understanding series resistance and interface dynamics in Al/Si<sub>3</sub>N<sub>4</sub>/n-GaAs MIS capacitors under frequency and voltage variations</i>                   |
|                 | <b>R. Darghouthi et al.:</b> <i>Fabrication and Characterization of Nitrate Ion Sensitive Membranes for Water Quality Monitoring</i>                                                                      |
|                 | <b>A. Aladim:</b> <i>Functionalisation of CVD graphene for gas sensing</i>                                                                                                                                |
|                 | <b>A. Ghouma et al.:</b> <i>Integration of Gas-FET sensors in the back-end-of-line of 28nm CMOS UTBB-FDSOI platform</i>                                                                                   |

*S. Cavalaglio et al.: Reduction of operating temperature of SnO<sub>2</sub>-based NO<sub>2</sub> Gas Sensors with Pd-nanoparticle functionalization*  
*Y. Hmamou et al.: The application of machine learning in demand forecasting within the scope of logistics 4.0*

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| [16:15 - 18:15] | [Oral session 6: Devices, Sensors and Applications (Room1)]                                                                                                                                                          |
| 16:15 - 16:35   | J. El Hmidi et al.: Design and Implementation of a 7.2 kW On-Board Charger Using Totem-Pole Bridgeless PFC and Full-Bridge LLC Resonant Converter                                                                    |
| 16:35 - 16:55   | J. Lahouaichri et al.: Design and Implementation of a High-Efficiency DC-DC Boost Converter with PWM Control in CMOS 0.18 $\mu$ m Technology                                                                         |
| 16:55 - 17:15   | O. Meskini et al.: Phase Change Materials combined with NIL-prepared metasurfaces for large scale tunable photonic applications                                                                                      |
| 17:15 - 17:35   | R. Aitayad: Manufacture and optimisation of ZnO-based high-frequency transducers                                                                                                                                     |
| 17:35 - 17:55   | H. Mamouni et al.: Design of a 180nm CMOS Li-Ion Battery Temperature Sensor Optimized by Genetic Algorithm                                                                                                           |
| 17:55 - 18:15   | A. Ajji: Improving PVDF piezoelectric properties using fillers and mechanical stretching                                                                                                                             |
| [16:15 - 17:55] | [Oral session 7 : Géophysique et Génie Civil 2 (Room2)]                                                                                                                                                              |
| 16:15 - 16:35   | A. Nait Salah: Effect of friction stir welding parameters on microstructure and mechanical properties of the dissimilar alloys of AZ91D and AA7075                                                                   |
| 16:35 - 16:55   | R. Ajana et al.: Evaluation and Modeling of the Stability of Underground Infrastructures: Case Studies and Perspectives                                                                                              |
| 16:55 - 17:15   | F. Dalhi et al.: LProcessing of ASTER imagery for hydrothermal alteration mapping and radiometric analysis to characterize associated mineralizations in the northern Bou Azzer region (Central Anti-Atlas, Morocco) |
| 17:15 - 17:35   | A. Banachir: Integration and Validation Of the Phase Change Materials On Thermal Comfort and Energy Efficiency Of Buildings Envelope                                                                                 |
| 17:35 - 17:55   | A. BAJADI et al.: La cartographie géologique des indices miniers de cobalt au sein du district minier de Bou Azzer : Apport de l'application mobile Arc pad dans l'exploration minière                               |

## [Wednesday, April 23, 2025]

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| [09:30 - 10:15] | [Plenary session 6 Dr. Saïd Hamdioui, Computer Engineering Laboratory - TU Delft, Netherlands, <i>Future Computing Chips: The Need for a New Mindset to Sustain the World in the Age of AI</i> ] |
| [10:15 - 11:35] | [Oral session 8 : Design of Integrated circuits]                                                                                                                                                 |
| 10:15 - 10:35   | F. Z. Ahamri et al: L'Art de l'Optimisation des OTA : Utilisation Algorithmique en Technologie CMOS 180 nm                                                                                       |
| 10:35 - 10:55   | N. Oubeha et al.: Automated Sizing of Analog Circuits Using Deep Learning                                                                                                                        |
| 10:55 - 11:15   | H. Touzani: IoT control system for the smart house: an embedded platform for the remote management of a connected home                                                                           |
| 11:15 - 11:35   | I. Salhane et al.: Parametric analysis on a circularly polarized antenna array resonating at a frequency of 5.8 GHz for system Microwave Power Transfer                                          |
| [11:35 - 12:00] | Closing Ceremony                                                                                                                                                                                 |