People's Democratic Republic of Algeria

Directorate General for Scientific Research and Technological Development- DGRSDT

The Research Center in Semiconductors Technology for Energetic - CRTSE

1st National Conference on Emerging Materials for Energy Storage and Conversion (NCEMESC'25)

NCEMESC Algiers 2025 **Online: December 03-04 2025**

The **1st National Conference on Emerging Materials for Energy Storage and Conversion (NCEMESC'25)** aims to explore the latest scientific and technological advances in the field of innovative materials playing a key role in the energy transition. In response to growing energy demand and the need to reduce greenhouse gas emissions, the development of more efficient, sustainable, and economically viable new materials has become crucial. This conference will highlight advanced solutions for energy storage (batteries, supercapacitors, etc.) as well as for energy conversion (photovoltaics, thermoelectrics, hydrogen, etc.). Special attention will also be given to carbon dioxide (CO_2) valorization a major challenge in the fight against climate change. Emerging catalytic and photocatalytic materials enabling the conversion of CO_2 into fuels or high-value-added chemicals will be examined, paving the way for a more sustainable circular carbon economy. This conference will serve as a meeting platform for researchers, engineers, PhD students, and industry professionals, promoting in-depth exchanges on the innovative materials of the future and their revolutionary applications in the energy sector.

Honorary Chairs

Dr. Hassani Salim (Director of CRTSE)
Dr. Keffous Aissa (CRTSE)

Conference Chair

Dr. Hadjersi Toufik (CRTSE)

Important Dates

Deadline for abstract submission: October 31th, 2025
Notification of abstract acceptance: November 10th, 2025
Registration : November 25th, 2025
Date of the conference: 03–04 December 2025

Bank Details (CRTSE)
Bank: BNA, Che Guevara Branch
Account No.: 00100599 0300 351 858/50

Abstract submission

It is our pleasure to invite you to submit your abstracts for **NCEMESC'25** via the following email **ncemesc25@gmail.com**

All abstracts must be written in clear, publication-ready English, with proper grammar and spelling. Presentations may be submitted in either English or French

All accepted abstracts will be published online in the proceedings of the conference with an ISBN.

Registration Fees

Students	**2500 DA**
Academics & researchers	**3500 DA**
Industry Professionals	**4000 DA**
Attendees (non-presenters)	**2000 DA**

Topics

1. Materials for Energy Storage

- Materials for lithium-ion, sodium-ion, and solid-state batteries.
- Supercapacitors and materials with high specific capacity.
- Hybrid materials for integrated storage devices.
- Degradation, recyclability, and durability of storage materials.
- Emerging phase change materials based on nanomaterials for thermal and electrical energy storage.

2. Materials for Energy Conversion

- Photovoltaic materials (perovskites, organic semiconductors, etc.).
- Thermoelectric materials for heat recovery.
- Development of hybrid and composite catalysts for CO_2 reduction.
- Photocatalysis and materials for direct solar conversion.
- Durability of encapsulating materials for high-efficiency PV modules.

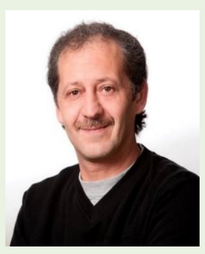
3, Emerging Technologies in Hydrogen Production and Storage

- Water electrolysis and photoelectrolysis processes.
- Development of nanomaterials for hydrogen storage.
- Next-generation electrode materials for fuel cells.

4. Advanced Design and Characterization Approaches

- Nanoscale engineering of materials
- Advanced characterization techniques (in situ, operando)
- Multiscale modeling and artificial intelligence in materials development

Speakers



Plenary Title:
Small Energy, Big Potential: How Microfluidic Fuel Cells Could Power Tomorrow's Devices

Dr. Mohamed Mohamedi

Plenary Title:
High-Performance Flexible Micro-Supercapacitors with Wide Working Voltage Window and Good Durability

Dr. Rabah Boukherroub

Plenary Title:
Towards a Sustainable Energy Transition: Microgrids, Renewable Storage, and Collaboration Opportunities

Dr. Mustafa Ergin Şahin

Plenary Title:
Reinventing Batteries for a Sustainable and Electrified World

Dr. Maher El-Kady

Contact : **E-mail:** ncemesc25@gmail.com **Phone:** 0562 71 02 15 **Web site :** https://crtse.dz/ncemesc-2025/

REGISTRATION FORM

Full Name	Assas Taqiyeddine
Affiliation	Laboratory of Hydraulic Developments and Environment (LAHE), Civil Engineering and Hydraulic Department, University of Biskra, Biskra, Algeria
E-mail	taqiyeddine.assas@univ-biskra.dz
Will participate in the Conference with: ☑ Oral Communication ☐ Poster	
Topic	**04.Advanced Design and Characterization Approaches**
Title	**"Free Vibration Analysis of Porous Functionally Graded Plates Using a Strain-Based Finite Element Model with Higher-Order Shear Deformation Theory"**
Please check your position box: ☑ Student ☐ Academic & Researcher ☐ Industry professional ☐ Attendees (non-presenters)	
Payment method	Bank transfert **Bank: BNA, Che Guevara Branch** **Account No.: 00100599 0300 351 858/50**

Please send the registration form to: ncemesc25@gmail.com

ACCEPTANCE LETTER

Dear ASSAS,

The Scientific Committee of the 1st National Conference on Emerging Materials for Energy Storage and Conversion (NCEMESC'25) organized by The Research Center in Semiconductor Technology for Energetics (CRTSE), has the great pleasure to inform you that your contribution Entitled:

"Free Vibration Analysis of Porous Functionally Graded Plates Using a Strain-Based Finite Element Model with Higher-Order Shear Deformation Theory "

has been peer reviewed and accepted as an **Oral** presentation at the CNMESCE' 25 to be held online from 03 to 04 December 2025.

Further information concerning conference and presentation details will be sent to you in due course.

Kind Regards,

Dr. Toufik HADJERSI
Chairman of the NCEMESC'25
Organizing Committiee

NCEMESC' 25
1st National Conference on Emerging
Materials for Energy Storage and Conversion
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People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
Directorate General for Scientific Research

Technologies Emergentes des Semi-conducteurs pour l'Energétique

NATIONAL CONFERENCE ON EMERGING MATERIALS FOR ENERGY STORAGE AND CONVERSION

(NCEMESC2025)

DECEMBER, 3-4 2025

CONFERENCE PROGRAM

ONLINE

NCEMESC2025

Contact : Email : snmesce25@gmail.com , Web site http://snmesce25.dz/

NATIONAL CONFERENCE ON EMERGING MATERIALS FOR ENERGY STORAGE AND CONVERSION

(NCEMESC2025)

Online December, 3-4 2025

Conference Program

Day-1 December 3, 2025	
08 :30 – 9 :00	**Welcome of participants (***online connexion)*
09 :00 – 9 :15	Conference Opening
09 :20 – 10 :10	**Plenary 1** *Title : Reinventing Batteries for a Sustainable and Electrified World* **Pr. Maher El-Kady** Session Chairs: T. Hadjersi&R. Belkada
10 :15 – 13 :00	Room 1 – Oral Session 1 Room 2 – Oral Session 2 Room 3 – Poster Session 1 Room 4 – Poster Session 2
13 :00-14 :00	**Lunch Break**
14 :00-14 :50	**Plenary 2** *Title: Towards a Sustainable Energy Transition: Microgrids, Renewable Storage, and Collaboration Opportunities* **Pr. Mustafa Ergin Şahin** Session Chairs: S. Kaci &M. Mebarki, **Auditorium**
14 :50 – 17 :20	Room 1 – Oral Session 3 Room 2 – Oral Session 4 Room 3 – Poster Session 3 Room 4 – Poster Session 4
17 :20	**Closing of the Day**

NATIONAL CONFERENCE ON EMERGING MATERIALS FOR ENERGY STORAGE AND CONVERSION

(NCEMESC2025)

Online December, 3-4 2025

Conference Program

Day-2 December 4, 2025	
09 :00 – 09 :50	**Plenary 3** *TitLe : High-Performance Flexible Micro-Supercapacitors with Wide Working Voltage Window and Good Durability* **Pr. Boukherroub Rabah** Session Chairs :N. Gabouze& S. Sali
10 :15 – 13 :00	Room 1 – Oral Session 1 Room 2 – Oral Session 2 Room 3 – Poster Session 1 Room 4 – Poster Session 2
13 :00-14 :00	**Lunch Break**
14 :00-14 :50	**Plenary 4** *Title: Small Energy, Big Potential: How Microfluidic Fuel Cells Could Power Tomorrow's Devices* **Pr. Mohamedi Mohamed** Session Chairs:K. Agroui, & A. Bouchhem
14 :50 – 18 :00	Room 1 – Oral Session 3 Room 2 – Oral Session 4 Room 3 – Poster Session 3 Room 4 – Poster Session 4
17 :05	**Closing of the Day**

Conference Program

Day-1 December 3, 2025	
Room 01 - Oral Session 01: Morning **Advanced Materials for Electrochemical Storage** Session Chairs: T. Hadjersi R. Belkada	
10 :15 – 10 :30	**SMAIL Sihem** : Energy storage performance in $BaTiO_3$ doped with Bi, Zr and Sn based classic and relaxor ferroelectric properties
10 :30 – 10 :45	**CHEBAHI Ardjouna :**Comparative Analysis of Materials for Lithium-Ion, Solid-State Batteries, and Hydrogen Energy Storage Systems
10 :45 – 11 :00	**Djaidifatiha :**Structural and Magnetic Properties of $Mg_{0.5}Zn_{0.5-x}Mn_xFe_2O_4$ Spinel Ferrite Nanomaterials for Energy Storage Applications
11 :00 – 11 :15	**MOULAI Fatsah** :MnO_2-layer electrode material for symmetrical supercapacitor
11 :15 – 11 :30	**Naima BOUDIEB**: Synthesis and characterization of PANI/PEDOT : PSS/GO for applications in supercapacitors.
11 :30 – 11 :45	**YADDADEN Chafiaa:**Nano-Composite based on Porous Silicon Nanowires and Nano-Tin for lithium Ion Batteries
11 :45 – 12 :00	**MERAZGA Salwa :**Improved electrochemical performances of LTO composite anodes for Li-ion batteries
12 :00 – 12 : 15	**BOUACHMA Soraya:** Synthesis and Electrochemical Evaluation of Ternary hydroxides Electrode Materials
Room 02 - Oral Session 02: Morning **Green Hydrogen and Fuel Cells** Session chairs: S. Kaci , A. El fiad	
10 :15 – 10 :30	**DEHBI Atallah** : Composite Nanomaterials for Efficient Electrocatalysis in Hydrogen Production
10 :30 – 10 :45	**MERAZGA Salwa**: Doping Effect of MOF-derived C and CNT on Electrochemical hydrogen storage performances $Mg_{1.9}Al_{0.1}Ni$ alloy
10 :45 – 11 :00	**ZIGHED Mohammed**: Challenges and hurdles for Green Hydrogen Production
11 :00 – 11 :15	**ChafaaKhatima** : Risk Analysis in Green Hydrogen Production Of Wind Power Systems
11 :15 – 11 :30	**Aimen Abdellah Bouaiss** : Neural Network Assisted Multi-Objective Optimization of Solid Oxide Fuel Cell channels geometry
11 :30 – 11 :45	**Alihellal Dounia**: Membrane Reactor: An Innovative Technology for Enhanced Hydrogen Production via the Water Gas Shift Reaction.
11 :45 – 12 :00	**BARR Amel** : Étude de la production d'hydrogène par photocatalyse.
12 :00 – 12 : 15	**ATTIA Selma**: Study of Hydrogen Evolution Under Visible Light Irradiation On $SrFe_2O_4$ Ferrite Photocatalyt
12 :15 – 12 :30	**KOUACHE Ahmed Zouhir:** A Techno-Economic Analysis of Green Hydrogen Integration in a Hybrid Energy System for a Telecommunications Station
Room 03 - Poster Session 01: Morning **Electrochemical Storage and Supercapacitors** Session chairs: **K. Benfadel & A. Larabi**	
10 :15 – 10 :25	**ABDELAZIZ Nadhir** : Comparative Thermal Analysis of Concentric and Elliptical Receiver Tubes with Phase Change Materials in Parabolic Trough Collectors
10 :25 – 10 :35	**Madaci Wissal** : Electrochemical Evaluation of CNT-Based Electrodes Derived from Algerian Gas Condensate for Energy Storage

10 :35 – 11 :45	**HADJI Fatah** : Accurate Prediction of Lithium-Ion Battery Remaining Useful Life Using Hybrid Machine Learning and Deep Learning Approaches
10 :45 – 10 :55	**BOUDJADJA Yazid** : Étude des propriétés structurales et morphologiques d'une cathode de pile a oxyde solide
10 :55 – 11 :05	**Berouaken Malika :** Physical and Electrochemical properties of LVO/C Anode Material for Lithium-Ion Batteries
11 :05 – 11 :15	**GHOMRI Amina**:Comparative analysis of approachesused for predicting and managing the performance of Li-ion batteries
11 :15 – 11 :25	**DJABRI Amina**: The study of the structural and magnetic properties of a rare-earth nanomaterial by ab initio methods for potential applications in energy storage.
Room 04 - Poster Session 02: Morning **Thermal Storage and Building Energy Management** Session chairs: A. Boukezzata & L. Talbi	
10 :15 – 10 :25	**HABIBIA smaa :** Study of Ni(II) and Mn(II) adsorption on a carob-based composite
10 :25 – 10 :35	**BEDJAOUI Mohamed Lamine**: Numerical investigation of heat transfer reduction in buildings using PCM-integrated Hollow brick
10 :35 – 11 :45	**KHERBOUCHE Djamila**: Residential Energy Storage Solutions and Their Development Prospects in Algeria
10 :45 – 10 :55	**KHERBOUCHE Djamila**: Study of a Hybrid Vehicle Powered by Photovoltaic Energy and Biodiesel
10 :55 – 11 :05	**BELARZEG Abdeldjalil**: Effect of novel fin distribution on the melting process of thermal storage units.
11 :05 – 11 :15	**BELKAFOUF Ikram**: Design and Theoretical Characterization of a New Organic Material for Organic Solar Devices
11 :15 – 11 :25	**BOUABÇA Asma**: Theoretical Study of the Electronic Properties of X_2YZ (X = Fe, Co; Y = Zr, Mo; Z = Ge, Sb) Ternary Heusler
11 :25 – 11 :35	**ABOURA Abderrahmane**: Accelerated Eddy Current Testing Using Multi-Element Sensors for Heat Exchanger Inspection.
11 :35 – 11 :45	**ARAB Fahima :** Thermoelectric Potential of Delafossite $KScS_2$ and $RbScS_2$: A DFT Study of Structural and Thermal Properties under Pressure
13 :00 – 14 :00	**Lunch Break**

Room 01 - Oral Session 03: Afternoon **Photovoltaic and Optoelectronic Materials** Session Chairs: **M. Mebarki & S. Belhousse**	
14 :50 – 15 :05	**CHARIF Rania** : Band Gap Engineering and Pressure-Dependent Physical Properties of Magnesium-Based Antimony Trirutile Oxides
15 :05 – 15 :20	**GOUDJIL Manel**: Design of D-A-π-A Sensitizers Incorporating Dithienosilole: Impact of π-Extended Auxiliary Acceptors on Photovoltaic Performance via DFT/TD-DFT Analysis
15 :20 –15 :35	**Ziyad Younsi** : Numerical Investigation of Band Alignment at the ETL/Perovskite Interface Using SCAPS-1D Simulation
15 :35 – 15 :50	**Barkat Sarra** : Numerical simulation of inverted perovskite solar cells with dual electron transport layers
15 :50 – 16 :05	**Ishak MEBARKIA**: DFT-Based Insights into the Optoelectronic Properties of Cubic CsPbX3 Perovskites for Energy Conversion Application.
16 :05 – 16.20	**KADDOURI Nadera** : Structures and performance of solar cells based on perovskite materials
16 :20 – 16 :35	**Mouna Ghemid** : Chemical synthesis and optoelectronic characterization of p-Cu_2O/n-ZnS/n-ZnO heterostructure on FTO for photovoltaic applications
16 :35– 16 :50	**Naceur Khadidja** : Investigation of Defect Density Effects on ZnO/Cu_2O Heterojunction Solar Cell Performance
16 :50 – 17 :05	**Oussama Djema** : Effect of Si particle size on the structural properties of AlSi paste for realization of Al local rear contacts in n-PERT RJ Si solar cells
Room 02 - Oral Session 04: Afternoon **Thermal Storage and Phase Change Materials** Session chairs: K. Agroui, F. Kezzoula	
14 :50 – 15 :05	**KADRI Meryem** : Integration of Emerging Phase Change Materials in Building Design for Thermal Energy Storage and Passive Comfort Regulation
15 :05 – 15 :20	**DIAFI Halla** : Influence of PCM volume on the efficiency of thermal storage and the performance of the absorber tube of a parabolic trough collector
15 :20 –15 :35	**BENIDIR Meriem** Structural, Thermal, and Thermoelectric Characterization of Nd-Substituted $Na_{0.74}CoO_2$.
15 :35 – 15 :50	**MESSARA Kahina:** Assessment of the thermal conductivity coefficient of compressed earth blocks reinforced with olive stone powde
15 :50 – 16 :05	**ELHACHMI Mounira** : Adsorptiveremoval of phosphate by MgZnCoAl and ZnAlcalcinedlayered double hydroxides : Kinetics, isotherms and statisticalphysics modeling
16 :05 – 16.20	**ARAB Fahima**: Potential of Delafossite KScS2 and RbScS2: A DFT Study of Structural and Thermal Properties under Pressure
Room 03 - Poster Session 03: Afternoon **Materials for Photovoltaics and Thermoelectrics** SessionChairs: S. Naama & Y. Siahmed	
14 :50 – 15 :00	**BAKHTATOU Ali** Structural, Electronic, and Optical Properties of Trigonal GeS_2 Monolayer for Photovoltaic Applications
15 :00– 15 :10	**BELOUFA Nabil** Comprehensive DFT Study of $AgAl(S_{1-x}Se_x)2$ Chalcopyrite Structural, Optoelectronic, Thermal and Thermodynamic Properties
15 :10– 15 :20	**BOUCHELAREM Naima** Effect of oxygen vacancies on the thermoelectric properties of SnO_2 (110) surface, first-principles study
15 :20– 15 :30	**SALIM Karim** Structural and optical characterization of Pb incorporated CuO thin films prepared by spray pyrolysis for photovoltaic applications
15 :30– 15 :40	**Charef Samir** First-Principles Study of the $K_2TlSbCl_6$ Double Perovskite: Potential for Solar Cell Applications

15 :40– 15 :50	**AZZAOUI Walid** Preparation and Characterization of Al-Sn Co-doped CdO Thin Films for Transparent Conducting Applications
15 :50 – 16 :00	**ANNAB Nassima** Numerical study of high-performance InGaN solar cells
16 :00 – 16 :10	**Mousaab BELARBI :** High-Efficiency Lead-Free Ag_3BiI_6 Solar Cells Enabled by IGZO Electron and PTAA Hole Transport Layers: A Numerical Study
16:10 –16 : 20	**Sarrah benomar** A Dion-Jacobson Semiconductor for UV Optoelectronics Predicted by Ab-Initio Calculations
16 :20 – 16 :30	**Ghalmi Leila:**Performance Enhancement of CZTSe Thin-Film Solar Cells through Numerical Optimization
16:30 – 1 6: 40	**SEDRATI Fatima Zohra:** First-Principles Study of NiO Nanomaterial for Photovoltaic and Optoelectronic Application
16:40 – 16: 50	**SARI ALI Inchirah** Comparative Analysis of the Electrical Behavior of Monocrystalline and Polycrystalline Photovoltaic Modules under Dark Conditions
16: 50– 17: 00	**SARI ALI Inchirah** Performance Analysis of Polycristalline silicon photovoltaic modules under partial shading in series and parallel configurations
17 :00 – 17 :10	**DRIS Keltoum**: Design and Numerical Investigation of a Dual-Absorber Hybrid Perovskite Solar Cell for Enhanced Photovoltaic Performance.
17 :10 – 17 :20	**NAMOUNE Abderaouf**: Investigation and Simulation of Transparent Organic Photovoltaic Cells Operating in the Visible Spectrum
Room 04 - Poster Session 04: Afternoon **Hydrogen Production and Storage** Session Chairs: A. Khen, M. Ifires	
14 :50 – 15 :00	**DJOUAMA NADINE**: Optimization of Hydrogen Production Via non-thermal Plasma proces
15 :00– 15 :10	**ARIBI Koubra**: Effect of ZrO_2 Doping of CeO_2-Supported Ni Catalysts for H_2 Production by Steam Reforming of Ethanol,
15 :10– 15 :20	**Mouna NACEF/ Mouni BEKKOUR:** Dissociation catalytique de l'eau sur plusieurs matériaux
15 :20– 15 :30	**Manel Hallassi**: Syngas production via dry reforming of methane over $Ni_{1.5}Zn_{1.5}m$ (m=Cr, Fe) catalyst.
15 :30– 15 :40	**Samira Saadoun:** Development of nanomaterials for hydrogen storage
15 :40– 15 :50	**Belayachi Cherifa**: Effect of bismuth content ON the framework of FAPSO4-5 as photocatalyst for hydrogen production.
15 :50 – 16 :00	**Siham Naima Derrar:** Hydrogen Adsorption on Functionalized Corannulene: Toward Efficient Solid-State Storage;
16 :00 – 16 :10	**Lilia ALALGA:**CO_x-free Hydrogen Production via Methane Decomposition over Nickel Based Catalysts: Effect of the Catalysts Preparation Method
16:10 –16 : 20	**Bensadallah Hayet:** Ab Initio investigation of the structural and electronic properties of FeTi and FeTiH compounds
16 :20 – 16 :30	**STEIFI Imen:**Sonochemically synthesized magnesium-based nanomaterial for photoelectrochemical green hydrogen generation.
16:30 – 1 6: 40	**THENIA Ahmed**: Chrome substitution in the 2c site position effect in hexagonal GdNi5 alloy storage hydrogen on structural, magnetic and mechanical properties: A first-principal study
16:40 – 16: 50	**DERKAOUI Khaled** : Transition Metal Ferrite Spinels (MFe_2O_4, M = Cu, Ni, Mn) : A Comparative Investigation for Photocatalytic and Hydrogen Evolution Applications
1 7: 20	**Closing of the Day**

Conference Program

Day-2 December 4, 2025	
Room 01 - Oral Session 01: Morning **Catalysis and CO_2 Valorization** Chairs Session: S. Anass & S. Kaci	
10 :00 – 10 :15	**DEHIMI LEILA**: Microkinetic Modeling of CO_2 Valorization over a Ni–Ga-Based Catalyst
10 :15 – 10 :30	**Boudiaf Merie**: Design of TiO_2–Modified Clay Supports for Stable and Active Ni Catalysts in the CO_2 Reforming of Methane
10 :30 – 10 :45	**CHETOUI ABDELMOUNAIM**: Understanding Charge Transfer Mechanisms through Band Structure Engineering in High-Purity $InVO_4/g\text{-}C_3N_4$ Z-Scheme System
10 :45 – 11 :00	**ANAS BOUSSA Sabiha**: Cobalt sulfide thin film deposition and characterization for CO_2 Conversion
11 :00 – 11 :15	**KOUIDRI Fatima Zohra:** Development of hybridmaterialsbased on carbon black reinforced PANI
Room 02 - Oral Session 02: Morning **Characterization and Synthesis of Functional Materials** Session Chairs: N. Gabouze & S. Sali	
10 :00 – 10 :15	**Omaima Aidat** : Advanced Design and Characterization Approaches for Optimizing Gelatin Extraction from Waste Using Response Surface Methodology (RSM)
10 :15 – 10 :30	**BALI AICHA** :Preparation and Characterization of Mn-Substituted Ammonium Phosphomolybdate Polyoxometalate
10 :30 – 10 :45	**Gadi Chifa** : High Harmonic Generation Spectra From Polyacetylene
10 :45 – 11 :00	**Halima Benathmane** : Elaboration and Characterization of Cu2O/ZnO and CuO/ZnO heterojunctions
11 :00 – 11 :15	**Nabil Benzerroug :** Comparison Study of Photoionization Cross Section in $GaAs/Al_xGa_{1-x}As$ Quantum Rings :Effects of Morphology, Temperature, Pressure and Electrical Field.
11 :15 – 11 :30	**Nesrine BENAROUS** : Combined Study of Intermolecular Interactions, In Silico Modeling and In Vitro bioassays of Two Schiff Base Polymorphs Derived from 2-aminobenzonitrile.
11 :30 – 11 :45	**TALHI Hadjer** : Experimental and DFT-Based Multiscale modeling of Novel Fe(III) Binary Complex with Antimicrobial and Antitumor Potential.
11 :45 – 12 :00	**Hadjer DIDOUH** : Eco-Engineered Nanostructured Coatings for Enhanced Corrosion Resistance and Energy Conversion Interfaces
12 :00 –12 :15	**BENSAID Nesrine** : Synthesis, structure, and characterization of Beta zeolite as an adsorbent material
12 :15 – 12 :30	**Messai Bahia :** Effect of Strontium Substitution on the Crystal Structure of PZT-Based Ceramics
12 :30 – 12 :45	**BELABED Naouel** : The effect of annealingtemperature and Na^+, Cl^- and F^- ions on the structure of TiO^2 for photocatalytic application
Room 03 - Poster Session 01: Morning **Catalysis, Environment and Water Treatment** Session Chairs: L. Maifi, A. Khen	
10 :00 – 10 :10	**Siali Mohammed EL Amine** : Solar-driven photocatalysis-adsorption hybrid process using polyaniline/cobalt-montmorillonite nanocomposite for methyl orange removal

10 :10 – 10 :20	**MIHOUBI Besma** : Synthesis and characterization of pure and La^{2+} (10 MOL%) doped $BaTiO_3$ powders by Sol-Gel method: Optical and photocatalytic insights
10 :20 – 10 :30	**CHINI Zine Labidine** : Water Treatment by Adsorption on a Natural Clay from the Rabta Region, Bordj Bou Arréridj Province.
10 :30 – 10 :40	**Salima KouiderELouahed** : Mechanistic Insights into Sustainable Biodiesel Production Using Mo–Zn/CaO Bimetallic Catalysts
10 :40 – 10 :50	**BENFADEL Karima** : Investigation of the stability and Selectivity of Sn-Doped Cu_2S for CO_2-to-Formate Conversion via Controlled Synthesis Routes
10 :50 – 11 :00	**KHEZNADJI Zakari** : Elaboration of hydroyethylmethacrylate (PHEMA)-based membranes : Study of swelling and adsorption of gold nanoparticles
11 :00 – 11 :10	**TABET Amina** : Biosynthesis of ZnO/CuO/Cu_2MgO_3 Ternary Nanocomposite for Improved Photocatalytic Degradation of Bromocresol Green in Wastewater Treatment
11 :10 – 11 :20	**Yaakoub SAADALLAH :** Electrochemical Synthesis and Characterization of Rare Earth-Doped Zinc Oxide Thin Films for Optoelectronic Applications
11 :20 – 11 :30	**RIKOUH Rahma Amina**: Gravimetric study of the inhibition of corrosion of XC48 steel in a 1M HCl environment by an organic Schiff base compound
11 :30 – 11 :40	**Wahiba Falek**: Spectral Analysis Adsorption Spectroscopy (SERS) Of Carboxylic Derivatives
11 :40 – 11 :50	**KACI Samira:** Electrochemical Properties of Pb@PbS/C/PVDF-based Composite used as Cathodes for CO_2 Electroreduction Conversion
11-50 –12 :00	**ARIBI Koubra :** Catalytic performance of Ni-Doped Co/La_2O_3 for degradation of malachite green by hetero-PhotoFenton oxidation
12-00 –12 :10	**DAIMALAH Meriem:** Advanced Design and Characterization of Spinel Photocatalysts for Visible-Light Degradation of Cefixime
12 :10 – 12 :20	**BELAYACHI HANANE**: The use of intensive and extensive processes to eliminate phenol from water
12 :20 – 12 :30	**BOURKEB Khaled Wassim**: Carbon electrochemical electrode for aqueous environmental analysis
12 :30 – 12 :45	**NAAMA Sabrina :** Effect of Etching Time on SiNWs Decorated with $ZnCo_2O_4$ for Environmental Remediation
Room 04 - Poster Session 02: Morning **Renewable Energy and Hybrid Systems** Session Chairs: K. Benfadel&A. Brik	
10 :00 – 10 :10	**Ouada Mehdi:** Enhancing Renewable Energy Conversion Efficiency Using Nanofluid
10 :10 – 10 :20	**DerrouicheNorhane Chiraz/ Hachem CHAIB**: Contribution of Study of thermal Properties of Geopolymer Concrete Based on Dune Sand
10 :20 – 10 :30	**BENAZZOUZ AFAK**: Simulation and Validation of an Absorption Chiller Machine Using the Characteristic Equation Method.
10 :30 – 10 :40	**DJABRI Issam**: Band Gap Engineering and Optical Anisotropy in Hydrogen- and Halogen-Terminated Planar SiliceneNanoRibbons : : A DFT-Based Analysis
10 :40 – 10 :50	**MOSBAH Salima :** Novelfluorescent materialutilized in organicelectron
10 :50 – 11 :00	**MEZOUAR Ali :** Couches minces de verres Ge–S–Ga dopés à l'Erbium pour l'amplification optique et la conversion d'énergie
11 :00 – 11 :10	**ABDELHAFIDI Asma**: Morphological and physico-chemical properties of HALS-stabilized LDPE films photo-oxidated
11 :10 – 11 :20	**CHIBANI Ouissem:** Interface-Engineered AZO/Metal/AZO Multilayers on Flexible PET Substrates : Effect of AZO Thickness and Metal Type on Structural and Optoelectronic Properties

11 :20 – 11 :30	**DEHNOUN Nesrine :** In-Situ Cobalt Functionalization of TiO_2 Nanostructures for Virus Biocaptors and Photocaptors
11 :30 – 11 :40	**ELIAS Abdenou**: Gasification-Based Energy Recovery from Olive Waste : A Case Study in the Tizi Ouzou Region
11 :40 – 11 :50	**GHOMRI Amina**: Development of a Predictive Model for Evaluating Photovoltaic Cell Performance
11-50 –12 :00	**CHIKH-BLED Bachir**: Modeling and Simulation of a Photovoltaic Energy System in Adrar
12 :00 –12 :10	**CHIKH-BLED Bachir**: Analysis of the Impact of Partial Shading on the Electrical Performance of Triple-Junction a-Si:H Photovoltaic Panels
12 :10 – 12 :20	**RAMDANI Omar** : Supervised Learning-Based Fault Detection in Photovoltaic Systems
12 :20 – 12 :30	**Kerkar Fouad :** Dislocation distribution in directional solidification of silicon ingot for photovoltaic applications
13 :00 –14 :00	**Pause déjeuner**
Room 01 - Oral Session 03: Afternoon **Modeling and Optimization of Energy Systems** Session Chairs: A. Bouchhem & F. Kerkar	
14 :50 – 15 :05	**RAHLI Chouaib** : Optimized Solar Energy Management Using IncCond MPPT and Battery Storage in Standalone PV Systems
15 :05 – 15 :20	**Cherrounrima** :Investigation of the effect of replacing the β-Ga_2O_3: Sn substrate with a 4H-SiC substrate in a β-Ga_2O_3-based solar-blind Schottky barrier ultraviolet photodetector
15 :20 –15 :35	**AssasTaqiyeddine** : Free Vibration Analysis of Porous Functionally Graded Plates Using a Strain-Based Finite Element Model with Higher-Order Shear Deformation Theory
15 :35 – 15 :50	**ABDEN Sofiane**: Stacking Ensemble Methods for Enhancing Water Quality Categorization
15 :50 – 16 :05	**Mebarek LAHBIB**: Thermal Modeling of Sandblasted and Non-Sandblasted Connectors A Comparative Experimental and Numerical Study
16 :05 – 16.20	**RABIAI Attia**: A Multi-level Cascaded H-Bridge Inverter Based on A New Simplified Space Vector PWM Method
16 :20 – 16 :35	**BOURAS Abdelkarim/ Boudiaf Rabah**: Reinforcement Learning for Short-Term Battery Management in a Renewable Thermal Hybrid System : A Case Study from Marseille, France.
16 :35– 16 :50	**Islam Zid** : Machine learning algorithms for the modeling and prediction of polycrystalline photovoltaic modules temperature.
16 :50 – 17 :05	**LAKHDARA Amira** : Predictive Control and Optimal Energy Management of a Hybrid PV-Hydrogen Microgrid.
Room 02 - Oral Session 04: Afternoon **Innovation in Processes and Materials** Session Chairs: Anas	
14 :50 – 15 :05	**Bouyelfane Asmaa**: Innovative Metallization Approaches in Solar Cells: A Technical and Economic Comparison of Aluminum and Copper Electroplating
15 :05 – 15 :20	**Khattra Mimouni**: Enhancing CdTe Solar Cell Performance via DFT and SCAPS-1D: Bandgap Engineering and Stability Optimization Using $Cd_{1-x}Zn_xTe$ Absorber Layers
15 :20 –15 :35	**Rahmani Mohamed:** Simulation Study on the Role of Perovskite and ETL Layer Thicknesses in Determining Device Efficiency.
15 :35 – 15 :50	**Ilyes Bouhidel** : L'Eau Ultrapure, un « Matériau » Incontournable pour Diverses Industries (SC, Pharmacie,…) et Activités (Labo. D'Analyses,…): Etude de Cas Réelle et Tendances de la Technologie

15 :50 – 16 :05	**Hammache Soumia:** Enhancing Building Energy Performance Through Plastic-Fiber Reinforced Adobe
16 :05 – 16.20	**BENCHEIKH Yasmina :** Effective hydrolysis of ammonia borane catalyzed by rutheniumnanoparticlesdeposited on siliconnanowire
Room 03 - Poster Session 03: Afternoon **Nanostructured Materials and Advanced Characterization** Session Chairs: S. Naama & S. Benredouane	
14 :50 – 15 :00	**BERRACHED Ismahane** : DFT study of the influence of Hydrogen on the Lattice structure and electronic property of wurtzite AlN
15 :00– 15 :10	**REZIG Walid** : In-Operando Investigation of the Thermally Induced Morphological and Physico-Chemical Evolution of Iron-Doped Silica Nanoparticles Derived from Diatomite for Photocatalytic Applications
15 :10– 15 :20	**AGTI FatimaZohra** : Non-Isothermal Crystallization and Mechanical Properties of Sb_2O_3–$NaPO_3$–WO_3 Glasses
15 :20– 15 :30	**BouticheSalima :** Ab initio study of ferroelectric structures: $BiCoO_3$
15 :30– 15 :40	**KAHLOUCHE Karima** : Nanoscale Design and Electrochemical Evaluation of a GO–PEI–CeO_2 Hybrid Composite for Sensor Development
15 :40– 15 :50	**Radia MALKI** : Ab-initio and Monte Carlo studies of physical properties of semiconductors based on Selenium.
15 :50 – 16 :00	**DAHO Salah Eddine:** First-principles investigation of the ground-state properties of SnTe at different pressures.
16 :00 – 16 :10	**Kinoucha Khalida :** Effect of composition on glass transition and crystallization
16:10 – 16 : 20	**Messaouda Ayachi :** Structural and optical properties of Cobalt-doped ZnO thin films
Room 04 - Poster Session 04: Afternoon **Artificial Intelligence and Multi-Scale Modeling** Session Chairs: R. Belkada& S. Kaci	
14 :50 – 15 :00	**GUEDIRI Mourad**: Adaptive Fuzzy Logic-Based Control of Electrical Power in DFIG for Efficient Grid Integration
15 :00– 15 :10	**GUEDIRI Mourad**: Performance Evaluation of Fuzzy-PI Controllers versus Genetic Algorithm-Based Speed Control for Doubly Fed Induction Generators...
15 :10– 15 :20	**GUEDIRI Abdelhafid**: Genetic Algorithm-Based Speed Control of DFIG for Efficient Power Delivery to the Electrical Grid
15 :20– 15 :30	**GUEDIRI Abdelhafid**: Intelligent Fuzzy Control Design for Intermediate-Power Wind Turbines Interfaced with Medium Voltage Networks
15 :30– 15 :40	**HEBBACHE Merwan :** Commande en MPPT par logique floue d'un système à base des piles à combustibles
15 :40– 15 :50	**MELAAB LOUBNA** : Modeling of the Rashba Effect in GaAs/AlGaAs Double Quantum Well Structures : Approximate vs k-Dependent Approach.
15 :50 – 16 :00	**LAGRAF Fairouz** : Study of the Cylindrical Surrounding-Gate MOSFETs at nanometric scale
16 :00 – 16 :10	**HADJILA NADIA** : Numerical Image Analysis for the Detection and Quantification of Microbial Inhibition Zones Using MATLAB
16:10 –16 : 20	**AbdelbassetRahmoune**: Non-Toxic Electron Transport Layers for MoS_2 Solar Cells: A Numerical Investigation
16 :20 – 16 :30	**LALAYMIA Imen** : Multiscale modeling and artificial intelligence in materials development
16:30 – 1 6: 40	**BEZZALLA Ayyoub** : Multiferroic character in $BaTi_{0.875}Fe_{0.125}O_3$ DFT study
16:40 – 16: 50	**BECHLAGHEM Fatima Zahra** : Numerical Study of Two HEMTs, AlGaN and InGaN, by Sharing the Drain Area for Power Application
16: 50– 17: 00	**Bouamama Lemya** : DFT study of the co-adsorption of F and O atoms on Si(111) surface

17 :05	**Conference Closing**

Free Vibration Analysis of Porous Functionally Graded Plates Using a Strain-Based Finite Element Model with Higher-Order Shear Deformation Theory

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ABSTRACT

This study introduces a novel finite element model for analyzing the free vibration behavior of porous functionally graded (PFG) plates using the assumed strain approach. The proposed model incorporates a five-variable higher-order shear deformation theory (HSDT) characterized by a symmetric V-shaped distribution of transverse shear strains and stresses through the plate thickness, ensuring zero shear stress conditions at the top and bottom surfaces. A new four-node quadrilateral finite element with five degrees of freedom per node is formulated by coupling the HSDT with a strain-based formulation. The material properties of the PFG plates are defined according to a power-law variation across the thickness, considering three distinct porosity distributions. Extensive numerical simulations are performed to validate the model's accuracy in predicting natural frequencies. Furthermore, the influence of boundary conditions, power-law index, porosity levels, loading configurations, and geometric parameters is systematically examined. The results show excellent agreement with existing analytical and numerical data, confirming the proposed model's robustness, accuracy, and computational efficiency in the vibration analysis of PFG plates.

KEYWORDS: Porous functionally graded plates, Higher-order shear deformation theory (HSDT), Assumed strain approach, Finite element method, Free vibration.