



10th International Conference on Materials Science & Smart Materials

MSSM2024

**Hybrid Venue: National and Kapodistrian University of Athens, [Main Building](#), Athens
Greece**

15th – 17th of May 2024

Day-1 15th of May 2024

Opening Session

09:00 9:10	Welcome Talk by: Prof. Ch. Karagiannis Vice Rector etc of the National and Kapodistrian University of Athens	
09:10 9:20	Welcome Talk by: Prof. Theodore Zahariadis Head of the Agricultural Development, Agrofood & Natural Resources Management Department	
09:20 9:30	Welcome Talk by: Prof. Vassilis Stathopoulos Conference Chair	
09:30 -10:15	Keynote Prof. Polycarpus Falaras Institute of Physical Chemistry NCSR “Demokritos”	Advanced Photoactive Materials for Solar Energy Conversion and Environmental Protection <i>“Chemistry Europe Lecture”</i>
10:15 – 10:45	Coffee Break	

SUSTAINABLE MANUFACTURING OF CERAMICS

Session A

Chairman: Prof. Ian Reaney

10:45 – 11:30	Keynote Prof. Ian M. Reaney University of Sheffield	Sustainable Ceramic Manufacturing: mitigation or bust
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11:30 – 11:50	Amir Khesro Johnson Tiles	Short and long- term carbon mitigation strategies in Ceramics
11:50 -12:10	Bertrand Delpech Brunel University London	Radiative Heat Pipe Ceiling for Waste Heat Recovery and Uniform Cooling in the ceramics industry
12:10 – 12:30	Chloe Button University of Sheffield	Cold assisted sintering of Al ₂ O ₃
12:30 – 13:00	Invited Talk Ge Wang University of Manchester	NaNbO ₃ -based dielectric ceramics: a (quasi)linear approach to high voltage and energy density capacitors
13:00-14:00	Lunch	
Session B Chairman: Prof: Ian M. Reaney		
14:00 – 14: 30	Invited Talk Prof. Paolo Columbo University of Padua	Additive Manufacturing of ceramics
14:30 – 15:00	Invited Talk Richard Todd Oxford University	Rapid sintering by local heating: mechanisms and prospects
15.00 – 15:20	Silvia Barbi University of Modena and Reggio Emilia	Developing tailored materials for the industrial production of AEM electrolyzers through a statistical approach
15:20 – 15:40	Federico Ferrari ALEA Design Srl	A comprehensive numerical approach for the simulation of the thermal processes in the ceramics sector
15:40-16:10	Coffee Break	
Session C Chairman: Prof: Ian M. Reaney		
16:10-16:40	Invited Talk Derek Sinclair	Using defect chemistry to control the dielectric and ionic



	University of Sheffield	conduction properties of polar perovskite oxides
16:40 – 17:00	E. Kagiara	Aluminosilicate based nano materials for demanding applications in the Cement and Aluminium industry
17:00 – 17:20	Hala Handal National Research Centre	Ferromagnetic-like behavior and Electrochromic performance of hierarchal NiO nanosheets synthesized via template driven hydrothermal synthesis
17:20 -17:40	Sherly Sari AGH University of Science and Technology in Kraków	A study on the structure, microstructure, and electrical conductivity of Y and Gd co-doped BaCeO ₃ -BaZrO ₃ proton conductors



Day-2 16th May 2024

Workshop on: Sustainable Recovery for Circular Economy
Chairman Prof. Lorna Anguilano

09:00 - 09:30	Keynote Prof. Lorna Anguilano Brunel University London	Sustainable Recovery for Circular Economy
09:30 – 9:45	Hande Sezgin	Examining How Thickness And Elastane Ratio Impact Sound Absorption In Recycled Pantyhose Acoustic Panels Via Full Factorial Analysis
09:45 – 10:00	Uche Onwukwe	Enhancing circular economy through metal remediation in brownfields: technical responses to Community Engagement
10:00 – 10:15	Darragh Doyle	Phytomining of Nanoparticles
10:15 – 10:30	G.D. Admans	Advanced materials characterisation for the circular economy: support to academia and industry research from the European project ReMade@ARI
10:30 – 10:45	Heba Ghazal	Characterisation of bio-oil produced from spent ground coffee through low temperature pyrolysis
10:45 – 11:00	Coffee Break	
Session on Sustainable Bioenergy Chairman: Prof. Rafat Al-Afif		
11:00 – 11:30	Keynote Prof. Christoph Pfeifer BOKU University	Biochar: overview on production and utilization routes
11:30 – 11:45	Gregor Tondl	Carbonized biogenic residues for cost-reduced carbon dioxide capture
11:45 – 12:00	Rafat Al Afif	Techno-economic evaluation of biogas production from olive mill waste and cattle manure – A case study of Montenegro
12:00 – 12:15	Ryan Altayeb	MXene based materials for Hydrogen PEM fuel cells applications and water management



12:15 – 12:30	Mohd. Yusof Bin Mohamad Mohamad	In vitro Analysis of Collagen Chitosan Scaffold Loaded with Metronidazole Nanoparticle for Periodontal Disease Treatment
12:30 – 12:45	Aidin Heidari	The Influence of Water vapor on Hydrogen Reduction of Iron Ore Pellets
12:45 -13:00	Magdi Rashad	District Cooling Technology in the Gulf Region.
13:00 – 14:00	Lunch	
Session on Advances in Materials Chairman: TBC		
14:00 – 14:15	Joseph Roussos Chemist – Sales Manager	Hellamco – Analytical Solutions in Material Science
14:15 – 14:30	Ming-Wei Wu	The sintered density, microstructure, and impact energy of binder jetting 316L stainless steel
14:30 – 14:45	Marysteven Uchegbu	Fabrication and characterization of porous Titanium Nitride (p-TiN) as a material for microelectrode based biosensing
14:45 – 15:00	Andrea Ehrmann	Homogeneity of physical properties of electrospun gelatin nanofiber mats
15:00 – 15:15	Nalin Kumar Sekara	Performance of stability and collision avoidance for ADAS vehicles under mixed traffic conditions
15:15 – 15:30	Ipsita A. Banerjee	Design and Investigation of Short Peptide Sequences and their Natural Antioxidant-conjugates for Targeting Protein Misfolding Diseases
15:30 – 15:45	Alina Dragomirescu	Direct energy deposition of Nickel-Based coatings on Nimonic 90
15:45 – 16:00	Coffee Break	



Symposium on Hydrogen & Fuel Cell Chairman: Prof. Dimitrios Tsiplakides Session H1		
16:00 – 14:15	Yichen Li	Optimization of the PEMFC zig-zag flow channel design using CFD simulation
16:15 – 16:30	Rohan Sahota	Using Conceive, Design, Implement and Operate in Rapid Prototyping of PEM Fuel Cell Bi – Polar Plates Using 3D Printing
16:30 – 16:45	Gowhar A. Naikoo	Green Hydrogen Production by Splitting Seawater
16:45 – 17:00	Nuriya Mukhamedova	Influence of Mechanofusion Parameters on the Structure Evolution of Hydrogen Storage Materials Based on Magnesium
17:00 – 17:15	Nikoleta Strataki	Development of Iridium Electrocatalysts Supported on Titanium Suboxide Substrates, TiO_{2n-1} , for PEM Water Electrolysis Systems
17:15 – 17:30	Pavlos K. Pandis	Enhanced Biohydrogen production from surface-modified stainless steel cathodes in a single-chamber microbial electrolysis cell
17:30 – 17:45	Arman Miniyazov	The Role Of Spark Plasma Sintering In The Development Of Hydrogen Storage Material
17:45 – 18:00	Marco Desiderio Loffredo Senesi	A design and testing supporting framework relating functions, material properties and performances of Gas Diffusion Layers in PEM Fuel Cells
18:00 – 18:15	Naouma Bimpiri University of Thessaloniki	Effect of B-site Doping in perovskite oxide $La_{0.75}Sr_{0.25}CrO_3$ in conductivity and electrochemical performance as fuel electrodes in SOF/SOE cells



Day-3 17th May 2024



**IWAYS Symposium
Chairman Prof. Luca Montorsi**

09:00 - 09:30	Invited Talk <i>by</i> Prof. Luca Montorsi Prof. Hussam Jouhara	Overview of iWays project - Innovative Water recovery Solutions through recycling of heat, materials and water across multiple sectors
09:30 – 9:45	Mohab Salem	The Effect Of The Humid Air And Cooling Water Parameters On The Efficiency Of A Condensing Heat Exchanger
09:45 – 10:00	Paraskevi Nanou	Texturing and surface chemistry modification for enhancing water condensation on stainless steel 304
10:00– 10:15	Paraskevi Nanou	Corrosion Behavior of Alloy 400 in Hydrofluoric Acid and Hydrochloric Acid Condensates: Insights from an Experimental Study
10:15 – 10:30	Alina Żabnieńska-Góra	Thermoelectric generator: from idea to a small scale prototype
10:30-11:00	Coffee Break	
IWAYS Symposium Chairman Prof. Luca Montorsi		
11:00 -11:15	Rytis Skominas	Scanning Technologies To BIM of Old Hydraulic Structures
11:15 – 11:30	Matteo Venturelli	Numerical approaches for waste heat recovery applications in metal industries.
11:30 – 11:45	Dariusz Łukowiec	The electronic structure of 1D Pd@Ni nanospikes and their electrochemical properties
11:45 - 12:00	João Ribeiro	Circularity assessment of industrial sector: Industrial water and energy consumption



12:00 – 12:15	Raffaello Pio Iavagnilio	Pre-heating of a steel ladle via a DC plasma torch: preliminary results on ecological impacts and comparison with a natural gas burner
12:15 – 12:30	Ilia Doliou	Pilot Scale High Temperature Thermochemical Heat Storage System for Industrial Heating Applications
12:30 – 12:45	Qusay Doraghi	Thermoelectric generator system: Computational modelling, experimental validation, and performance analysis
12:45 – 13:00	Antonis Vlasopoulos	Assessment of heat pipe technology for challenging industrial scenarios
13:00 – 14:00	Lunch	
14:00 – 14:30	Keynote Prof. Abdul Ghani Olabi University of Sharjah	Progress in two dimensional materials in energy storage/conversion devices
Symposium on Hydrogen & Fuel Cell Chairman: Prof. Dimitrios Tsiplakides Session H2		
14:30 – 14:45	Valentina Olabi	An optimisation model for a hydrogen supply chain network in Kuwait
14:45 – 15:00	Aishwarya Swamy	System Modelling of Fuel Cell Electric Vehicle with HESS Optimisation
15:00 - 15:15	Abdulrahman Alhajeri	Technical Assessment of Green Hydrogen Production in Kuwait
15:15 - 15:30	Tabbi Wilberforce	Introducing the Concept of Conceive, Design, Implement and Operate In Parameterization of Vehicle Mass, Fuel Density and Wheel Radius for Motor Bikes
15:30 – 15:45	Ibrahim Shomope	Enhancing Hydrogen Production Prediction in Proton Exchange Membrane Water Electrolysis through Optimized Neural Network
15:45 – 16:00	Mariana-Dana Damaceanu	DOPO-based polyimide blends towards membranes for CO2 separation
16:00-16:15	Coffee Break	
Symposium on Hydrogen & Fuel Cell		



Chairman: Prof. Dimitrios Tsiplakides		
Session H3		
16:15 – 16:30	Pavlos K. Pandis	Catalytic study of Mn, Ni and Fe-doped micro-ceria compounds towards value-added products
16:30 -16:45	Harishchandra Singh	Unlocking Carbonate's Potential in Solar Photocatalysis
16:45 – 17:00	Enas El-Sayed	Optimized Hydrogen from waste solar PV panels
17:00 – 17:15	Mustapha Baba Muhammad	A study into bioelectricity production using microbial fuel cell with acetate, glucose and wastewater as substrate
17:15 – 17:30	Mohammad Ali Abdelkareem	Challenges for the hydrogen production from saline water: progress and solutions
17:30 – 17:45	Travis Fenn	Additive Manufacturing to Improve the Performance and Weight Reduction of a Proton Exchange Membrane Fuel Using CDIO Educational Framework
17:45 – 18:00	Rouba Albostami	Novel Polymer Zirconium Silicate Composite Membranes for Enhanced Water Management in Hydrogen PEM Fuel Cells
18:00 -18:15	Nalin Kumar Sekar	Performance of Stability and Collision Avoidance for ADAS Vehicles Under Mixed Traffic Conditions
18:15 – 18:30	Susanna Airaksinen	Utilization of hydrogen fuel in reheating furnace and its effect on oxide scale formation of low-carbon steels
18:30 – 18:45	Prithvi Raj Pedapati	Enhanced Rider Assisting System for Electric Two-Wheeler: Dynamic Sensor-Based Simulation based on Prototype
18:45 - 19:00	Closing Remarks	
20:00 – 23:00	Conference Dinner & Awards Announcements	