



Theme:

“Fostering Tomorrow’s Possibilities:
Unveiling Innovations and
Applications with Smart Materials”



July 22-24, 2024
Berlin, Germany

2nd International Conference on
**Smart Materials
& Structures**

Smart Materials 2024

<https://smartmaterials.pagicle.com/>

SCIENTIFIC AGENDA

DAY-1

July 22, 2024

In-person Conference

Day 1

08:30 - 09:00 Onsite Registration & Seating Arrangement | Introduction & Opening Ceremony

Conference Chair: Klaus-Ulrich Neumann, SRH-Hochschule of Applied Sciences, Germany

Moderator : Manuela Oliverio, University Magna Graecia, Italy

Keynote Presentations

Sessions: Electrocatalysis, Catalytic Materials, Smart Materials & Structures

09:00 - 09:25 **Title: Novel Catalysts for High Temperature PEM Fuel Cells**

Dana Schonvogel, German Aerospace Center (DLR), Germany

09:25 - 09:50 **Title: Ni₂MnGa – The martensitic Phase in pseudo-tetragonal Approximation**

Klaus-Ulrich Neumann, SRH-Hochschule of Applied Sciences, Germany

09:50 - 10:15 **Title: Heterogeneous catalysis based on polyethylenimine for continuous in flow organic transformations**

Alessandro Sacchetti, Politecnico di Milano, Italy

Refreshment & Coffee - 10:15 - 10:30

Keynote Presentations Continue....

Sessions: Simulation & Modeling, Biomass Catalysis, Photocatalysis, Catalysis for Sustainable Energy, Nanostructured Catalysts, Catalysis in Organic and Polymer Chemistry

10:30 - 10:55 **Title: Where the Copenhagen Interpretation Fails: A Quantum Chemists View**

Irmgard Frank, Leibniz University Hannover, Germany

10:55 - 11:20 **Title: Catalytic Synthesis of Ureas Using Carbon Dioxide**

Toshiyuki Moriuchi, Osaka Metropolitan University, Japan

11:20 - 11:45 **Title: Catalytic Conversion of Carbohydrates into Green Platform Chemicals**

Charles Chunbao XU, City University of Hong Kong, Hong Kong

11:45 - 12:10 **Title: Photocatalytic Water Splitting for Hydrogen Production**

Hugo de Lasa, University of western ontario, Canada

12:10 - 12:35 **Title: Catalytic/Photocatalytic Activation of O₂/H₂O from Biomimetic Metal Complexes. Applications in Fuel Cells**

Anastasios D. Keramidas, University of Cyprus, Cyprus

12:35 - 13:00 **Title: Photoactive biowaste-modified metal oxide nanoparticles for bacteria disinfection and microplastics degradation**

Giuseppe Vitiello, University of Naples Federico II, Italy

Memorable Group Photo & Tempting Buffet lunch

13:00 - 13:45 (Tempting Buffet Lunch)

Session 2

Oral Presentations

Sessions: Catalytic Materials, Environmental Catalysis,
Photocatalysis, Catalysis for Sustainable Energy

- 13:45 - 14:05** Title: Metal doping as a strategy to improve catalytic performance
Patricia Concepcion, *Instituto de Tecnología Química (CSIC-UPV), Spain*
- 14:05 - 14:25** Title: Choline Chloride as new biobased chemical mediator for amide bond formation
Manuela Oliverio, *University Magna Graecia, Italy*
- 14:25 - 14:45** Title: Optimization of Biomass-derived Activated Charcoal supporting TiO₂ nanoparticles as a Photocatalyst for Green Hydrogen Evolution
Justine Auene, *University of Namibia, Namibia*
- 14:45 - 15:05** Title: New Catalysts for Energy Systems with high Energy Returned On Energy Invested
Innocenti Massimo, *University of Florence, Italy*
- 15:05 - 15:25** Title: Design of Dye-Sensitized Semiconductors Photocatalytic Systems for Promoting Eco-Friendly Processes in Water Matrices
Giuseppe Mele, *University of Salento, Italy*

Refreshment & Coffee - 15:25 - 15:45

Oral Presentations Cont..

Sessions: Advances Materials & Engineering, Nanomaterials, Nanotechnology and Sensors,
Energy-saving Materials, Advances Materials & Engineering , Advanced optical material or
optical material, Smart Materials & Structures

- 15:45 - 16:05** Title: Microstructure Characterization and Intermetallic compounds formation in Sub-10micron Sn-Ag Microbumps via Doping Zn and Ni in Cu Metallization
Jenq-Gong Duh, *National Tsing Hua University, Taiwan*
- 16:05 - 16:25** Title: Guiding of highly charged ions through capillaries in insulating materials: milestones in experiments and simulations
Nikolaus Stolterfoht, *Helmholtz-Zentrum Berlin für Materialien und Energie, Germany*
- 16:25 - 16:45** Title: First-principles assisted the design of high entropy thermoelectric materials based on half-Heusler alloys
Na Yan, *Northwestern Polytechnical University, China*
- 16:45 - 17:05** Title: Novel ultrasonic solidification technologies for magnesium alloy manufacturing
Wei Zhai, *Northwestern Polytechnical University, China*
- 17:05 - 17:25** Title: A lifetime on synthesis of nitrogen-containing liquid crystals in Taiwan
Win-Long Chia, *Fu Jen Catholic University, Taiwan*
- 17:25 - 17:45** Title: Analysis of Proband in Hereditary Colorectal Carcinoma using APC and MSH2 mRNA Quantitative Gene Expression and Bayesian calculation
Tjahjadi Robert Tedjasaputra, *University of Indonesia, Indonesia*

*** End of Day 1 ***

SCIENTIFIC AGENDA

DAY-2

July 23, 2024

In-person Conference

Day 2

08:30 - 09:00 Onsite Registration, Introduction

Keynote Presentations

Sessions: Computational Catalysis, photocatalysis

09:00 - 09:25 Title: Unravelling Palladium reconstruction under reaction conditions

Matthias Vandichel, *University of Limerick, Ireland*

09:25 - 09:50 Title: Ligand Topology as a Tool for In Silico Catalyst Optimization

Konstantinos Vogiatzis, *University of Tennessee, USA*

09:50 - 10:15 Title: Photo-induced degradation of priority air pollutants on TiO₂-based coatings in indoor and outdoor environments-A mechanistic view of the processes at the air/catalyst interface

Dimitrios Kotzias, *University of Bonn, Germany*

Refreshment & Coffee - 10:15 - 10:30

Keynote Presentations Continue....

Sessions: Catalytic Materials, Advances Materials & Engineering

10:30 - 10:55 Title: Calculation and data-driven MOF catalyst discovery: Rational design and intelligent synthesis

Ge Wang, *University of Science and Technology Beijing, China*

10:55 - 11:20 Title: Materials Design of ZnO- and In₂O₃-Based Conductive Films for Wide Applications

Tetsuya Yamamoto, *Kochi University of Technology, Japan*

Oral Presentations

Sessions: Computational Catalysis, Nanostructured Catalysts, Electrocatalysis, Chemical Engineering, Smart Materials & Structures

11:20 - 11:40 Title: Cathodic Hydride Formation and Structure-Activity Relations in Hydrogen Evolution Reaction on Palladium Surface

Apinya Ngoipala, *University of Limerick, Ireland*

11:40 - 12:00 Title: Nanocatalysts for wastes valorization and circular economy

Angelo Nacci, *University of Bari Aldo Moro and CNR - Istituto di Chimica dei Composti Organometallici (ICCOM), Italy*

12:00 - 12:20 Title: Hydrogen Sulfide Utilization and Removal by Simultaneous Adsorption and Catalysis in Fuel Cells

Venko Bechkov, *Bulgarian Academy of Sciences, Bulgaria*

12:20 - 12:40 Title: Adsorption Dynamics in Porous Materials: A Hybrid Grand Canonical Monte Carlo-Molecular Dynamics Simulation Approach

Sousa Javan Nikkhah, *University of Limerick, Ireland*

12:40 - 13:00 Title: Improvement of Mechanical Properties of Polyamids with Filler Reinforcement

Lubov Andrusiv, *United States Air Force Academy, USA*

Memorable Group Photo & Selfie

Tempting Buffet Lunch 13:00 - 13:45

Session 2

Oral Presentations Cont..

Sessions: Chemical Engineering, Materials Science and engineering, Advances Materials & Engineering, Smart Materials & Structures

- 13:45 - 14:05** Title: **From bench to bedside: design, prototyping and applications of OnePot® reactor**
Marco Francardi, *Katakem B4Chem srl, Catanzaro, Italy*
- 14:05 - 14:25** Title: **Creating a digital twin and how it helps to speed up your coating development**
Nick Bierwisch, *Saxonian Institute of Surface Mechanics, Germany*
- 14:25 - 14:45** Title: **Characteristics of Oxide Semiconductor Films Deposited by Reactive Plasma Deposition**
Hisashi Kitami, *Sumitomo Heavy Industries, Ltd., Japan*
- 14:45 - 15:05** Title: **A Green Concrete made only from Waste Concrete Powder and Biomass Waste**
Ejazulhaq Rahimi, *Ritsumeikan University, Japan*
- 15:05 - 15:25** Title: **Multi-functional shape memory polymer composites and applications**
Yujie CHEN, *Shanghai Jiao Tong University, China*

Refreshment & Coffee - 15:25 - 15:45

Oral Presentations Cont..

Sessions: Materials Science and engineering, Advances Materials & Engineering, Smart Materials & Structures, Carbon Nanomaterials, devices and technologies, Nanomedicine and Biomedical Engineering

- 15:45 - 16:05** Title: **NIR-triggered Conjugated polymers/Liquid crystal elastomer Actuators for Potential Biomedical Applications**
Gary CP Tsui, *The Hong Kong Polytechnic University, Hong Kong*
- 16:05 - 16:25** Title: **Development of Green Platform Based on 3D Graphenes**
Mineo Hiramatsu, *Meijo University, Japan*
- 16:25 - 16:45** Title: **Antimicrobial surfaces for aircraft cabins**
Sebastian Geier, *German Aerospace Center, Germany*
- 16:45 - 17:05** Title: **Carbon nanofibers/carbon foam composites for electromagnetic interference shielding and thermal insulation**
Bugao Xu, *University of North Texas, USA*
- 17:05 - 17:25** Title: **Ion density evolution in the plasma jet vacuum arcs**
Diego Fernando Devia Narváez, *Technological University of Pereira, Colombia*

Poster Presentation

Sessions: Industrial Catalysis, Photocatalysis, Computational Catalysis

Title: Nitrous Oxide Abatement Technologies in the Ostwald Process with Precious Metal-based Catalysts

Karina Hemmer, *Heraeus Precious Metals GmbH & Co. KG, Germany*

Tilte: Steel slag as low-cost catalyst for photoreduction of CO₂ and water splitting

Angelo Nacci, *University of Bari Aldo Moro and CNR – Istituto di Chimica dei Composti Organometallici (ICCOM), Italy*

Tilte: Computational Insights into LiTB as Molecular Electron Transfer Catalyst at the TFT|water Interface

Raju Lipin, *University of Limerick, Ireland*

17:25-18:05

Tilte: Microstructural, Mechanical and Tribological Evaluation of High Entropy TiAlTaZrNb Coatings Manufactured by Magnetron Sputtering

Gilberto Bejarano Gaitán, *University of Antioquia, Colombia*

Tilte: Improving self-healing performance of asphalt pavement through Ecofriendly and smart materials based on microencapsulation technology

Yousra Zghoundi, *Mohamed VI Polytechnic University, Morocco*

Tilte: Self-Healing Concrete Innovations for Sustainable Seismic Infrastructure

Andres Josue Ramirez Colchero, *Western Institute of Technology and Higher Education, Mexico*

Tilte: Boosted photocatalytic H₂ production over p-n S-scheme heterojunction of OD Ni₃V₂O₈ quantum dots decorated on ultra-thin 2D g-C₃N₄ nanosheets

Nabil Al-Zaqri, *King Saud University, Saudi Arabia*

Closing Ceremony | Awards | Certificate of Presentation

***** End of Day 2 & Conference *****