



FNMA 2025

The 20th Conference on Functional and Nanostructured Materials

Conference Schedule for December 5-6, 2025 – Online via MS Teams

Day 1, Friday, 5 December 2025

15:25 – 15:30 T. Miruszewski – Opening & Introductory Talk

Session 1. Chair: T. Miruszewski

15:30 – 15:45 Z. Dendzik – Microscopic and macroscopic aspects of prenematic fluctuations in nanoparticles-doped liquid crystals

15:45 – 16:00 M. Dominów – Producing environmental-friendly high-energy gas mixtures for solid oxide fuel cells via unrecyclable plastics pyrolysis

16:00 – 16:15 B. Bochentyn - On the way to understanding the great catalytic activity of ceria-based anode materials for biogas-fed Solid Oxide Fuel Cells

16:15 – 16:30 M. Nowakowska – Structural and transport properties of triple-conducting (Ba,Sr)(Fe,Mo,Zn,Zr)O₃ perovskites for Solid Oxide Fuel Cell technology

16:30 – 16:45 J. Adamczyk – Combining the benefits of conventional and high-entropy materials – mid-entropy perovskites for application in solid oxide fuel cells

16:45 – 17:00 K. Zielińska – Modified multi-component perovskites: the influence of additional 3d dopant in a new group of SrCo_{0.7-x}Ta_{0.1}Mo_{0.1}Mn_{0.1}X_xO_{3-δ} (X: Cu, Ni, Fe) oxides

17:00 – 17:15 R. Zafar – A-Site Deficiency and B-Site Substitution Synergies in NdBa-Based Double Perovskites for High-Performance IT-SOC Electrodes

17:15 – 17:30 Z. Chen – Laser-Anchored Ruthenium in a Protective TiN-TiO₂ Matrix for Highly Stable Acidic Oxygen Evolution

17:30 – 17:45 I. Shtablavyi – Influence of synthesis conditions on the surface morphology and phase composition of Al-Cu-Ni alloys obtained by selective laser melting



17:45 – 18:00 S. Amatori – The CECOMECE project: CEria-based COmpounds as effective catalyst for electrochemical cells

18:00 – 18:15 Break

Session 2. Chair: B. Bochentyn

18:15 – 18:30 K. Kujawska – Surface modification of Ni-YSZ anodes to improve the stability of biogas-fed SOFC

18:30 – 18:45 A. Sikorski – Macromolecules in a solvent of varying quality. Monte Carlo computer simulations

18:45 – 19:00 B. Venhryn – Effect of FeCl_3 activation modification on the change in the porous structure of nanoporous biocarbon

19:00 – 19:15 Y. Wang – Identifying the effect of doping and cooling rate on presence of ordered and disordered phases in Mn-based rocksalt-type cathode materials for Li-ion batteries

19:15 – 19:30 J. Winiarski – DFT-based screening of $\text{REBa}_{1-x}\text{Sr}_x\text{Co}_{2-2y}\text{Cu}_{2y}\text{O}_{5+\delta}$ candidate air electrode materials for solid oxide fuel cells and electrolyzers

19:30 – 19:45 M. Czudec – Determining the influence of Ag and Ni phases on the thermoelectric characteristics of multicomponent oxide composites

19:45 – 20:00 B. Fu – Niobium modification of 9-series Ni-rich NCA cathode materials for lithium-ion batteries: An LSTM model for degradation prediction

20:00 – 20:15 M. Venhryn - High-Efficiency Terahertz Radiation Modulator Based On Single-Crystalline Germanium

20:15 – 20:30 J. Zdankiewicz – Ceramic–polymer composites for 3D–printed catalytic sieve converting gaseous stream into useful fuels for SOFC

20:30 – 20:45 K. Wojciechowski – A few words on systems exhibiting a negative Poisson's ratio

Day 2, Saturday, 6 December 2025

Session 3. Chair: A. Witkowska

10:00 – 10:15 P. Duniec – Overview of quantum technologies and their availability for science

10:15 – 10:30 J. Dziedzic – Biochemistry and electrochemistry from first principles using ONETEP



10:30 – 10:45 F. Bagnoli – Synchronization and control of Lorenz systems

10:45 – 11:00 M. Dudek – The effect of the presence of a microwave magnetic field on the magnetic ordering of a ferromagnetic material

11:00 – 11:15 L. Amir – Density Functional Theory Study on the Photovoltaic Properties of End-Capped Acceptor-Modified Phenylsulfonyl Carbazole Materials for Solar Cells

11:15 – 11:30 P. Szatan – Simulations of chemical vapor deposition of a graphene layer on a copper substrate

11:30 – 11:45 A. Rani – Low-Temperature (60°C) Synthesis of Sodium-Doped Triazine/Heptazine g-C₃N₄/Bi₂S₃ Heterostructures for High-Performance Supercapacitors

11:45 – 12:00 K. Hałagan – Quantum Chemical and Biological Insights into Redox Activity of Metallacarborane Complexes in Cancer Cells

12:00 – 12:15 I. Kindrat – Optical Spectroscopy of the Tb-doped and Tb-Ag-co-doped Lithium Tetraborate Glasses

12:15 – 12:30 Break

Session 4. Chair: T. Miruszewski

12:30 – 12:45 S. Muzaffar – Performance of Cu-Ag Thin Film Catalysts Deposited by Thermal Evaporation for CO₂ Reduction in Flow cell system

12:45 – 13:00 B. Padlyak – Spectroscopy and optically stimulated luminescence of the β -irradiated Li₂B₄O₇:Cu,Eu glass

13:00 – 13:15 I. Shcherba – Valence-Variable Rare-Earth Systems: Candidates for Next-Generation Adaptive Materials

13:15 – 13:30 J. Narojczyk – Systematic study of altering elastic properties of the f.c.c. hard sphere crystal containing different nanolayer-nanochannel inclusions composed of aperiodic phase of hard dumbbells

13:30 – 13:45 K. V. Tretiakov – Magneto-hydrodynamic self-assembly versus a new criterion for forming non-equilibrium self-organization structures

13:45 – 14:00 J. N. Grima - Cornish – Can auxetics be both functional and beautiful?

14:00 – 14:15 E. Bajada – New Auxetic Perforated Sheets Based on the ‘Rotating Squares’ Model

14:15 – 14:30 J. N. Grima – Better Sports Safety Gear Through the Use of Auxetics

14:30 J. Rybicki/T.Miruszewski – Closing Remarks & Summary of the Conference