



European Materials Research Society

2025 Spring Meeting

May 26 – 30 | Strasbourg Convention Centre

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SYMPOSIUM N

Advanced doping strategies, defect states and electronic structure
of functional oxides

Oral sessions : MADRID 1 – GROUND FLOOR

Poster sessions : ETOILE – FIRST FLOOR

Symposium Organizers:

Anke WEIDENKAFF, Technical University of Darmstadt, Institute of Materials Science, Fraunhofer Research Institution for Materials Recycling and Resource Strategies, Germany

Jurij KORUZA, Graz University of Technology, Austria

Nicola PERRY, Science & Engineering, University of Illinois Urbana-Champaign, USA

Toshio KAMIYA, Laboratory for Materials and Structures, Tokyo Institute of Technology, Japan

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Monday May 26

N01 Fermi Level Engineering

Chairperson(s): KORUZA Jurij

WEIDENKAFF Anke

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08:45	781	Analysis of doping by X-ray photoelectron spectroscopy as the basis for Fermi level engineering of oxide electroceramics KLEIN Andreas (Invited)
09:15	1097	XPS study of mixed conducting Ba(Co,Fe)O3-δ LIU Yue
09:30	817	Probing workfunction and band energy alignment at the ZnO/CoPc hybrid interface: impact of CoPc thickness and fluorination AKBARI NIA Sakineh
09:45	1057	Analysis of the Fe ^{2+/3+} Charge Transition Level in Fe-doped perovskite oxides CHAOUDHARY Savita

Monday May 26

N02 Defect Modeling

Chairperson(s): DE SOUZA Roger

KORUZA Jurij

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10:30	2948	Oxide Cathodes for Lithium and Sodium Batteries: Exploring Redox and Dopant Effects on the Nano Scale ISLAM Saiful (Invited)
11:00	541	Oxide-ion transport at low and high electric fields in brownmillerite Sr ₂ Fe ₂ O ₅ and perovskite SrFeO _{2.5} : a molecular dynamics study AMBAUM Sonja
11:15	1988	Cationic substitutions by transition metal atoms in SrTiO ₃ : first-principles simulations RUSEVICH Leonid
11:30	2390	Theory of Doping and Defects in Complex-Oxide Semiconductors JANOTTI Anderson (Invited)

Monday May 26

N03 Defect Engineering I

Chairperson(s): JEONG Jae kyeong

WEIDENKAFF Anke

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14:15	210	Electron Glass Phase with Resilient Zhang-Rice Singlets in LiCu ₃ O ₃ CONSIGLIO Armando
14:30	543	Magnetization reversal and linear magnetoelectricity in M ₄ Nb ₂ O ₉ ; impact of substitutions at the M site MAIGNAN Antoine
14:45	1382	Carrier transition is superior to lattice defects in regulating electromagnetic property of LaCrO ₃ -based perovskite YANG Junjie
15:00	509	Advancing Calcium Cobaltite Ceramics: Dual Spark-Plasma Texturing and Electrospun Nanoribbons for Superior Thermoelectric Performance FELDHOFF Armin (Invited)
15:30	750	Synthesis of Multi-alloyed Perovskite Oxynitride Nanoparticles Towards Sustainable High Entropy Thermoelectric Materials MOORE Simon
15:45	2433	Green preparation of in-situ nonmetal doped ZnO-based hybrid materials for solar driven photocatalysis and energy storage applications KUMAR Susheel

Monday May 26

N04 Defect Engineering in Devices

Chairperson(s): KORUZA Jurij

SIOL Sebastian

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16:30	1732	Crystallographic Structure Engineering in Indium Gallium Oxide Thin-Film Transistors: Enhanced DIBL Immunity and Performance for Next-Generation Memory Applications JEONG Jae Kyeong (Invited)
17:00	204	Layered Ga Passivation for Highly Stable and Reliable ZnO Thin-Film Transistors Towards Low Power Consumption Displays BUKKE Ravindra Naik
17:15	1651	Investigation of the interface effect into ZnO-based nanostructures decorated with size-selected Au nanoclusters LENTINI CAMPALLEGIO Claudio
17:30	2244	The Role of Oxygen Vacancies in Sputtered Molybdenum Oxide Ultra-Thin Films for High-Efficiency Energy Devices LA MANNA Salvatore

Tuesday May 27

N05 Defect Engineering II

Chairperson(s): BUCHER Edith

KORUZA Jurij

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08:45	443	Evolution of the material properties of Zr-doped ceria LUBOMIRSKY Igor (Invited)
09:45	2583	Impact of sintering temperature on the functional properties of Sm/Ta co-doped Bi4Ti3O12 piezoceramics PALIWAL Dr. Srishti

Tuesday May 27

N06 Defect Engineering for Catalysis

Chairperson(s): LUBOMIRSKY Igor

WEIDENKAFF Anke

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10:30	1270	Doping strategies to tune electrocatalytic properties in AA'B2O5+ δ layered-type perovskites GARCÍA-MARTÍN Susana (Invited)
11:00	1185	Self-doping of Ru pyrochlore electrocatalytic materials LÓPEZ VERGARA Adrián
11:15	2095	Topochemical Reaction Strategies for Modifying Structural–Optical Properties of Indate-Based Oxides for Suitable Photocatalysis PERWEEN Shama
11:30	1396	Investigating the electronic structure of doped SrTiO ₃ and BaTiO ₃ single crystals for the oxygen evolution reaction NEUMANN Marie Charlotte
11:45	2024	Oxidation rate enhancement by interrupting O ₂ supply during Si dry oxidation on Si(001) surfaces TSUDA Yasutaka

Tuesday May 27

N07 Defect Engineering in Thin Films

Chairperson(s): KORUZA Jurij

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14:15	1613	Functional ceramics for solid oxide fuel and electrolysis cells: achievements and perspectives BUCHER Edith (Invited)
14:45	2029	Chemical State Analysis for the Accelerated Development of Semiconducting and Insulating Thin Film Materials SIOL Sebastian (Invited)
15:15	236	Optimized Antimony-Doped Tin Oxide Thin Films with Enhanced Electrical Properties deposited via scalable Aerosol-Assisted Chemical Vapour Deposition RAMZAN Iqra
15:30	2895	Technology tuning aspects of the nickel oxide preparation and doping by metalorganic aerosol deposition for electrochromic applications VATAVU Sergiu
15:45	15	Lead doping's effects on the optical and structural properties of ZnO nanoparticles made by the sol-gel process DEJENE Francis

Tuesday May 27

N08 Defect Engineering in Battery Materials

Chairperson(s): ISLAM Saiful

KORUZA Jurij

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16:30	461	Exploring Catalytic Potential: Novel Applications and Post-Processing Methods for LiCoO ₂ SEHIRLIOGLU Alp (Invited)
17:00	1842	Complementary Doping and Coating Strategy for High-Performance Single-Crystalline NMC Li-Ion Cathodes DWIPUTRA Endy Nugroho
17:15	2362	Investigating the effect of Cobalt and Iron doping on high entropy spinel oxides as a bifunctional electrocatalyst for rechargeable zinc-air batteries GEYIKCI Uygur
17:30	2595	Doping strategies leading to hexagonal MoO ₃ -based high performance eco-friendly Al-ion batteries Díaz-Guerra Carlos
17:45	3023	Electrochemical performance of La0.75Sr0.3Mn1-xNixO3 electrocatalysts in aprotic Lithium-air battery SAJEEV Sandra

Wednesday May 28

N09 Defect Engineering in Mixed Ionic-Electronic Conductors

Chairperson(s): FELDHOFF Armin

WEIDENKAFF Anke

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08:45	1483	The mix and the match: compositional complexity in $\text{Ba}_2\text{In}_2\text{O}_5$ PERVERSI Giuditta (Invited)
09:15	2590	Tailoring the Properties of $\text{Ba}_2\text{In}_2\text{O}_5$ for Advanced Functional Applications XIAO Xingxing
09:30	3130	Cationic substitution in the $\text{La}_{0.65}\text{Sr}_{0.4}\text{Fe}_{0.8-x}\text{Mn}_{0.2}\text{O}_{3-\delta}$ system: an X-ray diffraction and TEM study NATALI SORA Isabella
09:45	1462	Enhancing the Hydrogen Tolerance of $\text{La}_{0.6}\text{Ca}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$ Oxygen Transport Membranes with the Substitution of 10% Mn at the B site for Plasma Assisted CO_2 Conversion RASHID Aasir

Wednesday May 28

N10 Anionic Doping

Chairperson(s): GARCÍA-MARTÍN Susana

WEIDENKAFF Anke

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10:30	642	Mixed-Anion Approaches to Structural and Electronic Tuning in Functional Materials KAGEYAMA Hiroshi (Invited)
11:00	1663	Optical and electrical characterisation of $\text{BaTi}(\text{O},\text{N})_3$ oxynitrides as photoabsorbers BARROSO Margarida
11:15	769	An approach for developing synthesis strategies and mechanisms of perovskites with complex anion composition by Fermi level engineering CLEMENS Oliver (Invited)

Wednesday May 28

NP03 Poster Session

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13:45	01_1328	Enhancing IGZO Contact Resistance via Source/Drain Metal Oxide Formation MIN Juseong
13:45	02_1333	Quantitative analysis of defect states in In-based amorphous oxide semiconductors via differential reflectance transient spectroscopy GO Jinyoung
13:45	03_1516	Influence of Eu-doping in Barium Titanates LÓPEZ VERGARA Adrián
13:45	04_1999	Structural Asymmetry and Photocatalytic Activity in Bi-Doped Pyrochlores KUMAR Adarsh
13:45	05_2027	UV persistent luminescence of Bi-doped LiYGeO_4 : comparison between bulk and microparticles Carvalho Maria
13:45	06_2044	LaCoO_3 epitaxial thin films for advanced thermoelectric applications ZHU Tongwei
13:45	07_206	Observation of polarons and intervalence charge transfer in MoO_3 -x nanostructures via defect engineering NITHARWAL Ravindra Kumar
13:45	08_215	Dual Functionality in Cr-doped $\text{Ba}_2\text{In}_2\text{O}_5$ WIDENMEYER Marc
13:45	09_2214	Structural characterization of undoped and doped $\beta\text{-Ga}_2\text{O}_3$ crystals: Comparative analysis of (001) and (-201) orientations Yilmaz Selen Nur
13:45	10_2257	Development of Hafnium Carbide for Hard Metal Cutting Tools REDDY Raghu C
13:45	11_2273	Doping stability of Y in BaCeO_3 and BaZrO_3 using ab-initio thermodynamics KIM Jong-Yoon
13:45	12_2281	Functional properties of non-stoichiometric lead-free $0.94(\text{Na}_{1/2}\text{Bi}_{1/2})\text{TiO}_3\text{-}0.06\text{BaTiO}_3$ piezoceramics PARHI Chinmay Chandan
13:45	13_237	Transparent Conductive Fluorine and Titanium Co-doped Zinc Oxide Films via Aerosol Assisted Chemical Vapour Deposition RAMZAN Iqra
13:45	14_2491	Point defects in (N, Mg)-doped copper oxide thin films deposited by radio-frequency magnetron sputtering Nguyen Ngoc Duy

13:45	15_2827	Oxygen vacancy interaction with grain boundaries in SrTiO ₃ and BaTiO ₃ : Insights from atomistic simulations using machine learning interatomic potentials Serour Mahmoud
13:45	16_286	Studies on the effect of sintering temperature on structural, microstructural, and dielectric properties of multi-cations spinel high entropy oxide MISHRA Rajesh K.
13:45	17_2960	Surface investigation of non-stoichiometric doped indium and gallium oxide thin films NISTOR Magdalena
13:45	18_331	Metal–Insulator Transition via Ion Irradiation in Epitaxial La _{0.75} Pr _{0.3} MnO _{3-δ} Thin Films ZHOU Shengqiang
13:45	19_354	Interface engineering for minimizing trapped charge density in β-Ga ₂ O ₃ Schottky barrier diodes for high-performance power devices KUMAR Mukesh
13:45	20_42	The Effect of Multielement Doping in Tungstic Acids Synthesized via Submerged Photosynthesis for All Solar Energy Utilization LIN Hsueh-I
13:45	21_766	Investigation nickel oxide (NiO) thin films deposition mechanism for using a novel deposition method, “Electrostatic Spray Deposition (ESD)” and its application to efficient energy conversion ABBAS Md Fysol Ibna
13:45	22_810	Fermi-Level Pinning by Oxygen Interstitials in Ba ₂ In ₂ O ₅ ? Insights from Ab-initio Defect Chemistry Calculations SCIOTTO Rachele
13:45	23_834	Understanding the Behaviour of Hole States for Copper Substitutionals in MgO MORGAN Liam
13:45	24_965	Plasmon-free Surface-Enhanced Raman Scattering with Ultrahigh Enhancement Factors via Coupled Resonance in Ni-Doped Sub-Stoichiometric Tungsten Oxide Nanoflowers GHOSAL Sirsendu

Thursday May 29
N12 Grain Boundary Engineering
Chairperson(s): ATTFIELD J. paul
KORUZA Jurij

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08:45	1594	The Exsolution Phenomenon in Perovskite Oxides: Why does it happen? And how? DE SOUZA Roger (Invited)
09:15	1202	Influence of defect chemistry on grain boundaries in CaTiO ₃ THEIS Lukas

09:30	1698	The effect of doping on the reduction-induced structural change of LaMnO ₃ +δ JOSEPH Linda
09:45	2507	A defect chemical perspective on grain-boundary corrosion in urania: A case study of the 5[310][001] grain boundary WOLF Matthew

Thursday May 29
N13 Doping Strategies for Optical Properties
Chairperson(s): WEIDENKAFF Anke
ZHOU Shengqiang

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10:30	1429	Cation doping and order in complex high pressure perovskites ATTFIELD J. Paul (Invited)
11:00	1272	Exploring LiYGeO ₄ :Bi ³⁺ as a Long-Lasting, Self-Sustained UV Luminescent Emitter PROENÇA Inês
11:15	1340	Broad-band emitting Cr ³⁺ doped MgGa ₂ O ₄ for NIR-LED applications THEKKE PARAYIL Reshmi
11:30	1694	MgZnO nanoparticles as the electron injection and charge control layer for performance improvement of quantum dot light emitting diodes YU Hsin-Chieh
11:45	2835	Smart Pr ³⁺ -activated Ca ₃ Ga ₂ Ge ₃ O ₁₂ Phosphor for Persistent Luminescence and X-ray Imaging Applications and Multi-modal Luminescence via Er ³⁺ /Yb ₃₊ Codoping ANNU Annu

Thursday May 29
N14 Doping & Defect Engineering
Chairperson(s): KORUZA Jurij
WEIDENKAFF Anke

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13:45	2665	Co-doping Effects in BaTiO ₃ DICKEY Elizabeth (Invited)
14:15	2799	Defect Compensation for Bi and N acceptors in β-Ga ₂ O ₃ TON-THAT Cuong
14:30	2477	Defect Structures in Materials: Insights through EPR Spectroscopy ERDEM Emre (Invited)
15:00	330	Defect engineering for oxide thin films by ion irradiation ZHOU Shengqiang (Invited)