



European Materials Research Society

2023 Spring Meeting May 29 | June 2

40th Anniversary

Congress & Exhibition Centre, Strasbourg, France

SYMPOSIUM T

Frontiers of in-situ materials characterization - from new instrumentation
and methods to imaging aided materials design

Symposium Organizers:

Jordi ARBIOL, ICREA & ICN2, Barcelona, Spain

Sara BALS, EMAT, University of Antwerp, Belgium

Maria Chiara SPADARO, ICN2, Barcelona, Spain

Milena HUGENSCHMIDT, EMAT, University of Antwerp, Belgium

systems for nanometrology
SURFACE
..... always sm@rter solutions

ThermoFisher
SCIENTIFIC

 **DENS**
solutions

Wednesday May 31

**T_P
Poster session**

Etoile (1st floor) - 4.30 p.m to 6.30 p.m

01_2611	Diffraction study on magnetic thin films for spintronics	HIMANSHU Himanshu
02_2505	Hexagonal Close-packed Palladium Hydride in liquid cell TEM by Radiolysis Engineering	CHUN Dong Won
03_2564	Atomic structure of partially reduced nickelate films	YANG Chao
04_1300	Time-resolved TEM of nanomaterials with nanosecond electron pulses	PICHER Matthieu
05_1396	Development of a Surface-Modified Quartz Crystal Microbalance Technique to monitor Hydroxyapatite Film Growth in situ	MURPHY Brid
07_157	Engineering the magnetic properties of dual-phase high-carbon steel by controlling the microstructure(Developing a non-destructive method for microstructural characterization)	SARMADI Negin
08_68	Automatic and on-demand synthesis of AgAu alloy nanoboxes by PID control	BUI Hoang Khang
09_101	Diffraction-limited hyperspectral mid-infrared micro-ellipsometry	EBNER Alexander
10_105	A new compact SEM detector for Reflection Energy Loss Spectroscopy (REELS) and Elastic Peak Electron Spectroscopy (EPES) with imaging capability	STAIB Philippe
11_185	Temperature Effect on the Nucleation and Crystallization of Formamidinium-based perovskite	WANG Yunfan
12_187	Unraveling the Crystallization Process in Mixed Halide Wide Bandgap Perovskite by In-situ Dynamic Optical Probing	ZENG Zixin
13_242	In situ growth of cyclodextrin-based metal organic framework air filters for reusable SO ₂ adsorbent applications	KIM Jooran
14_510	Transmission electron microscopy and X-ray diffraction studies on tin antimony sulfide nanopowder	KHEMIRI Naoufel
15_655	Effects of electron beam irradiation in the all-inorganic halide perovskite, CsPbI ₃	BOSE Shaona

16_697	From Research to Development: Innovative multi-layer polypropylene-random pipes for heating-cooling systems with high dimensional stability	VOURLIAS Georgios
17_733	In-Operando Raman Spectroscopy during Electrochemical Ageing of Mn Oxide Thin Films in Aqueous Electrolytes	MACRELLI Andrea
18_793	Investigation of in-situ Scanning Electron Microscopy Technique for Microstructural Evolution of Li-ion Batteries	CHO Jiung
19_804	HERFD XAS study double-atom catalysts for the oxygen evolution electrocatalysis	LIAO Yen-Fa
20_884	Initial stages of crystals nucleation at the metal electrode – melt interface	STESYUK Tatyana
21_999	In-situ synchrotron X-ray diffraction analysis of pearlitic steel subjected to shear deformation	ALVES DA SILVA Carlos
22_1040	In-situ study of diameter control, composition and growth dynamics in Au-seeded GaSb nanowires	MARNAUZA Mikelis
23_1077	Unraveling the multilayer growth behavior of InGaAs nanowires using In-situ TEM	SJÖKVIST Robin
24_1283	In situ Transmission Electron Microscopy (TEM) study of the reduction of TiO ₂ to Ti _n O _{2n-1} magnéli phase	SCHMIDT Léon
26_1792	Electron beam effects on the oxidation of Cu nanoparticles in environmental scanning transmission electron microscopy	ZIASHAHABI Azin
27_1826	Electron microscopy investigations of nanostructures transformation under e-beam illumination	SPADARO Maria Chiara
28_2460	In situ (S)TEM characterization of bimetallic atomic cluster catalysts	BALALTA Deema

Tuesday May 30

T01

Liquid TEM, Batteries, and Fuel Cells

Chairperson(s) : ARBIOL Jordi - HUGENSCHMIDT Milena

Varsovie (Ground floor)

10:00	2308	INV	Accessing the radiation chemistry at nanomaterials/water interfaces using electron microscopy and spectroscopy	ABELLAN Patricia
10:30	1465		Understanding Zn Dendrite Growth in Different Aqueous Electrolytes by in situ liquid cell TEM	YUAN Yi
10:45	432		Understanding the role of the solid-electrolyte interphase in Li and Na batteries by operando transmission electron microscopy	ROBERTSON Alex
11:00	2397		In situ Raman spectroscopy to study phase transitions in La ₂ NiO _{4+d}	ADEEL RIAZ Adeel
11:15	2455		Shining a light on batteries: introducing a novel light scattering technique for the study of Li-ion dynamics and characterisation of battery electrode materials	LANGLEY Cathryn
11:30	639		In-situ TEM Observation of Phase Transformation of Materials at Nano Scale	HUANG Yizhong
11:45	2395		Characterizing Self-Assembled Nanoparticles in Liquid: Importance of Native environment for Electron Microscopy.	ARENAS ESTEBAN Daniel

Tuesday May 30

T02

3D techniques and Catalysts

Chairperson(s) : BALS Sara - SPADARO Maria Chiara

Varsovie (Ground floor)

13:30	2443	INV	Investigating nanoparticle restructuring and nanoparticle – support dynamics using advanced operando electron microscopy	JENKINSON Kellie
14:00	2596		In-Situ High-Temperature Gas and Vacuum 3D Electron Diffraction for Studying Structural Transformations upon Redox Reactions	VANDEMEULEBROUCKE Daphne
14:15	889		In situ transmission electron microscopy study on the restructuring of Au-Pd core-shell catalysts	PERXÉS I PERICH Marta

14:30	2464		Unraveling the diffusion at the atomic scale in 3D: heat-induced alloying in single-crystalline and pentatwinned Au@Ag nanoparticles.	MYCHINKO Mikhail
14:45	675		Operando proton-transfer-reaction time-of-flight mass spectrometry of carbon dioxide reduction electrocatalysis	REN Hangjuan

Tuesday May 30

T03

Structure-Property relations

Chairperson(s) : BALS Sara - SPADARO Maria Chiara

Varsovie (Ground floor)

15:00	2694	INV	Revealing Structure-Property Correlations in Memristive Devices	MOLINA-LUNA Leopoldo
15:30	2575		Mechanisms of deformation processes in NiTi shape memory alloys determined by in situ study of texture evolution combined with post mortem analysis of martensite variant microstructures in TEM.	SITTNER Petr
15:45	2281		Infrared imagery: an advanced tool to characterize in-situ nanomaterials	BELLETT Daniel

Tuesday May 30

T04

Nanostructured material investigation with TEM and X-ray-based methodology

Chairperson(s) : ARBIOL Jordi - HUGENSCHMIDT Milena

Varsovie (Ground floor)

16:30	500	INV	In-situ heating (scanning) transmission electron microscopy for exploring the thermal stability of a nanoscale complex solid solution thin film	ARBIOL Jordi
17:00	1116		Direct insight into the activation mechanism of Fe and Sb catalysts by operando TEM and XAS techniques	TRAORE Aliou Sadia
17:15	1742		Shedding lights on the birth of hybrid perovskites: a correlative study by In-Situ TEM and synchrotron based SAXS/WAXS	SIDHOUM Charles
17:30	824		In-situ study of Materials Performance and Structural Properties with high spatial resolution	DAVYDOK Anton

17:45	1507	Time-resolved cathodoluminescence spectroscopy of silicon nanoparticles	FIEDLER Saskia
18:00	1878	In-situ structural phase transition visualization and domain imaging in bulk NiO through dark field hard X-ray microscopy	RODRIGUEZ-LAMAS Raquel
18:15	129	Synthesis of functional metal in metal colloids for applications in catalysis and energy storage	DAENEKE Torben

Wednesday May 31

T05

Beam sensitive and 2D materials

Chairperson(s) : BALS Sara - SPADARO Maria Chiara

Varsovie (Ground floor)

10:00	2179	INV	Advances in In-Situ Electron Microscopy: From Growth of 2D Materials to the Thermoresponsive Behaviour of PNIPAM Colloids	VAN HUIS Marijn
10:30	289		Fully optical in-operando investigation of electrical switches in ambient conditions	SYMONOWICZ Joanna
10:45	1845		An insight into the mechanism of dealumination in zeolite: an in situ TEM study on the route of Al	GIRELLI CONSOLARO Valentina
11:00	2273		Direct insight into phase transition of boehmite coupling electron tomography with in-situ gas phase Transmission Electron Microscopy	SUDHEER Nivedita
11:15	2375		Real-time observation of molecular dynamics and chemical reactions in STEM	ZAMANI Reza
11:30	2739		Doping-induced assembly of conjugated polymer interpreted by in-situ TEM	LEE Eunji
11:45	1983		Impact of electron beam irradiation on Carbon Black Oxidation	WAHLQVIST David

Wednesday May 31

T06

Solar Cells and Photocatalysts

Chairperson(s) : BALS Sara - SPADARO Maria Chiara

Varsovie (Ground floor)

13:30	619	INV	Monitoring Structural dynamics Using In Situ Electron Microscopy	HANSEN Thomas Willum
14:00	399		Kelvin Probe Force Microscopy under variable illumination: a novel technique to unveil charge carrier dynamics in GaN	GONZÁLEZ-IZQUIERDO Palmerina
14:15	674		Operando FTIR investigation of surface species reactivity in the photocatalytic reduction of CO ₂ in vapour phase over Pt/TiO ₂	DANKAR Joudy

14:30	727		How can three-dimensional and multimodal X-ray microscopy reveal the impact of voids in CIGS solar cells?	FEVOLA Giovanni
14:45	1449		In-line quality control of perovskite photovoltaics by using intensity dependent photoluminescence	HACENE Benjamin

Wednesday May 31

T07

Heating and environmental TEM

Chairperson(s) : ARBIOL Jordi - HUGENSCHMIDT Milena

Varsovie (Ground floor)

15:00	309	INV	Operando TEM in catalysis research: Bridging the pressure gap	KOOYMAN Patricia
15:30	1286		High-Temperature Oxidation of Titanium Aluminium Nitride Coatings Visualized by Environmental Transmission Electron Microscopy	EK Martin
15:45	1133		In-situ TEM Observations of Interface Engineering between Ti and Ga ₂ O ₃	HSIEH Pingwen

Wednesday May 31

T08

Electron Microscopy and Micromechanics

Chairperson(s) : ARBIOL Jordi - HUGENSCHMIDT Milena

Varsovie (Ground floor)

16:30	1181	INV	Environmental Electron Tomography for material science	ROIBAN Lucian
17:00	260		Machine-learning-based, in-situ estimation of ceramic's microstructure upon the laser spot brightness during laser sintering	PENG Fei
17:15	736		Direct injection of coherent free-electron radiation into an optical fiber	LIEBTRAU Matthias
17:30	1797		Two Microscopes are better than One - in-situ Correlative Analysis by Combination of AFM and SEM	FRERICHS Hajo
17:45	1804		Nanoindentation material testing using SMART and SMART CUBES for non-ambient conditions	BEDORF Dennis

18:00

2346

In situ Extreme Micromechanics – Recent
Innovations and Prospects

WIDMER Remo

