

# WORKSHOPS AND SHORT COURSES - SUNDAY

Time: 08:30 – 17:50

Room: 731+732

## WS-03 (EuMC)

### Microwave Characterization and Modelling at Nano and Micro-Scale of Advanced Materials to Enhance Emerging Products Manufacturing

Chair: Kamel Haddadi<sup>1</sup>, Johannes Hoffmann<sup>2</sup>

<sup>1</sup>University of Lille, CNRS / IEMN, <sup>2</sup>METAS

On one hand, Manufacturing industry offers a large range of organic and inorganic based materials addressing numerous applications. The quality and performance of the final manufactured products depend strongly on their chemical/electrical/optical/mechanical properties at nanoscale as well as their arrangements at macroscale (amorphous, partially isomorph, hybrid/composite, multi-layered). On the other hand, microwave to mm-wave nondestructive testing and evaluation methods are well established for determining electrical properties of materials. A variety of methods including far to near field free-space, guided, resonant and scanning probe microscopy offers numerous solutions for Macro down to Nano scale characterization. In this context, the objective of this workshop is oriented towards RF to mm-wave techniques and related instruments dedicated to nondestructive evaluation applicable to wide range of emerging materials. This workshop is proposed in the frame of the H2020-NMBP-07-2017 MMAMA "Microwave Microscopy for Advanced and Efficient Materials Analysis and production" ([www.mmama.eu](http://www.mmama.eu)).



#### Programme

### MMAMA project objectives: Study of electrical properties of organic semiconductors and photovoltaic nanostructures using microwave characterization methods

David Moerman<sup>1</sup>, Olivier Douheret<sup>1</sup>, Pascal Viville<sup>1</sup>

<sup>1</sup>Materia Nova

### Dielectric resonator scanning of wafer - size surfaces at finer - than - head resolution

Malgorzata Celuch<sup>1</sup>

<sup>1</sup>QWED

### Quasi free-space TEM Material Measurements

Alireza Kazemipour<sup>1</sup>

<sup>1</sup>METAS

### Synthesis, Verification and Reproducibility of Microwave Design Materials

Christoph Baer<sup>1</sup>

<sup>1</sup>Ruhr University Bochum

### Wideband Electrostatic Force Microscopy (EFM): Broad Frequency Range with High Sensitivity

Georg Gramse<sup>1</sup>, Ferry Kienberger<sup>1</sup>

<sup>1</sup>Keysight Labs

### Tips and Calibration of Nearfield Scanning Microwave Microscopes

Johannes Hoffmann<sup>1</sup>

<sup>1</sup>METAS

### Microwave Microscopy based on GHz Surface Acoustic Waves on thin Film Materials

Luca Pierantoni<sup>1</sup>, Davide Mencarelli<sup>1</sup>, Andrea Di Donato<sup>1</sup>, Marco Farina<sup>1</sup>

<sup>1</sup>Universita Politecnica delle Marche

### FEM Solver for Drift-Diffusion Semiconductor Equations coupled with full Maxwell Electromagnetics

Arif Guengoer<sup>1</sup>

<sup>1</sup>ETHZ

### Combined Atomic, Microwave and Electron Microscope: A tool for Hybrid Characterization of Nanomaterials

Petr Polovodov<sup>1</sup>, Didier Theron<sup>2</sup>, Gilles Dambrine<sup>1</sup>, Kamel Haddadi<sup>1</sup>

<sup>1</sup>University of Lille, CNRS / IEMN, <sup>2</sup>CNRS / IEMN

### Integrated Fluorescence and Scanning Microwave Microscopy: Nano-Imaging with GHz on System With "Proof of Life

Zahra Nemati<sup>1</sup>, Jinfeng Li<sup>1</sup>, Peter Burke<sup>1</sup>

<sup>1</sup>UC Irvine