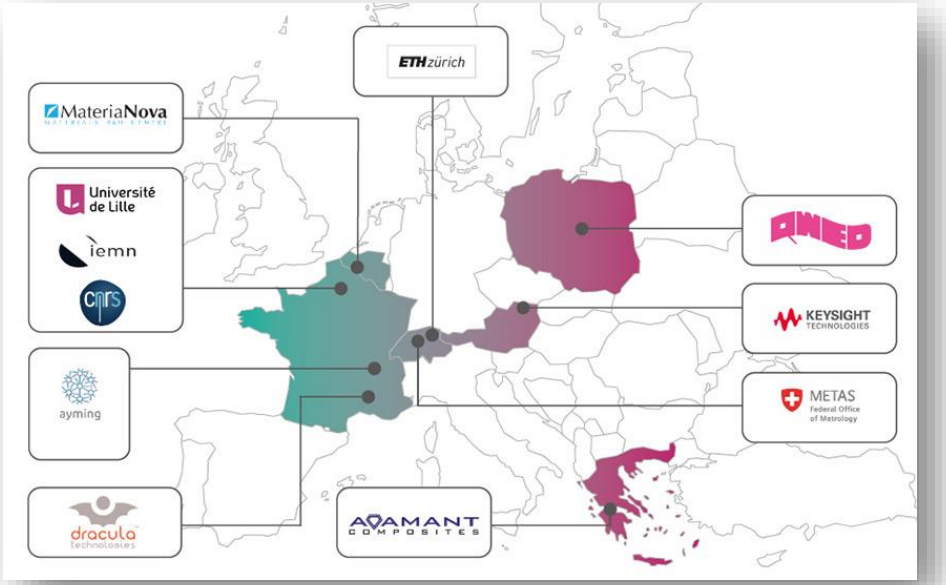
AN AMBITIOUS PROJECT

An ambitious project gathering a complementary Characterization / Modelling / Materials / Products set of European competences in the field of emerging energy products.

CONSORTIUM

9 Partners / 6 Countries / (FR, BE, CH, AT, PL, GR)



https://www.mmama.eu

MMAMA

MICROWAVE MICROSCOPY FOR ADVANCED AND EFFICIENT MATERIALS ANALYSIS AND PRODUCTION

The MMAMA project aims at enabling advanced material analysis and boosting its quality and production efficiency thanks to the GHz measurement and modelling platform in a wide community.

Second Year Results

This project has received funding from the European Union's Horizon 2020 Research and Innovation program under Grant Agreement N° 761036

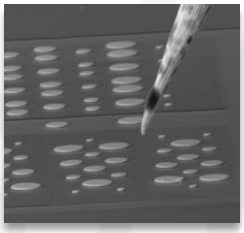
By the end of the second year of the project, the major results expected from the MMAMA project are now established, some of which are beyond the initial expectations.

MICROWAVE MULTI-SCALE DISRUPTIVE INSTRUMENTS

For the field of instrumental development, the project has several demonstrators.

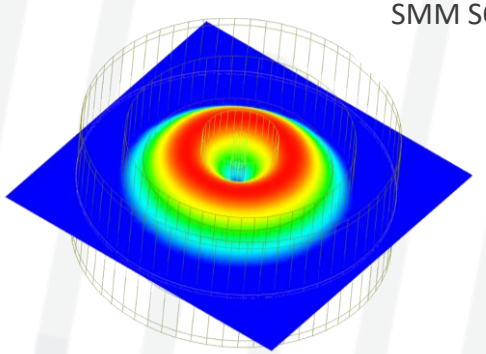
For nano-scale characterization, the project has a large panel of disruptive SMM technologies: an SMM/SEM in the frequency range 2-110 GHz; a tuning-fork SMM using coaxial probe in a vertical configuration and a wideband frequency AFM for kHz – 20 GHz electrical measurements.

Not initially scheduled, the development along impedance spectroscopy with large spectral range allows from bridging between low frequency characterisation methods with that of microwaves. For the macroscale characterization dedicated to production lines, MMAMA has validated several microwave imager technologies such as dielectric resonator coupled with 2D scanner; dielectric measurements with the probe kit and associated calibration solution and finally microwave free space imager.



MULTI-PHYSICS AND MULTI-SCALE MODELLING

A coupled solver that able to model semiconductor materials under electromagnetic excitation has been developed in order to simulate SMM with semiconductor materials. The semiconductor solver is based on Poisson-Drift-Diffusion equations, and provides very accurate modelling for semiconductors for SMM frequencies up to the millimetre-wave regime (80 GHz). Modelling problems of industrial relevance are currently focused on the enhanced modelling of dielectric resonator measurements.



ADVANCED MATERIALS FOR ENERGY APPLICATIONS

A large panel of organic semiconductors for photovoltaic (PV) applications at Dracula Technologies, integrated in a metal – insulator - semiconductor device architecture, fabricated by Materia Nova have been successfully investigated by impedance spectroscopy and SMM techniques. Carbon µ-fiber based composite materials, elaborated by Adamant Composites are characterized by SMM and C-AFM microscopes.

OPEN ENVIRONMENT AND DEVELOPMENT OF STANDARD OPERATING PROCEDURES

The open innovation environment consists of a simply accessible platform (www.mmama.eu/open-innovation-platform) with several levels of access for public, stakeholders and partners. Additionally, a Zenodo community has been started (zenodo.org/communities/mmama-h2020).

Concerning pre-normative nanometrology, Standard Operating Procedures (SOPs) on SMM, coaxial probe and dielectric resonators have been implemented. First workshop on SMM SOP has been held at EuMW 2019 conference. A second workshop is planned in conjunction with MIKON 2020 conference in May 2020. Moreover, a round robin with the SMM SOP has been initiated.