



PARTNER PRESENTATION AND INTEREST IN HORIZON EUROPE PARTICIPATION



The National Institute for Research and Development in Microtechnologies (IMT), Laboratory of Microsystems for Environmental and Biomedical Applications Organization type: Research Institute

Short description of the organization:

IMT Bucharest is a non-budgetary public research unit, established in 1993 and supervised by the Romanian Ministry of Research, Innovation and Digitalization since 1996 when it became a national institute. Being an internationally competitive organization, IMT has been involved in world class research in the fields of micro- and nanoelectronic components and systems, including smart sensors, micro- and nanotechnology for biomedical applications, integrated devices, systems and platforms, portable self-powered devices for medical monitoring, multichannel probes for bio-signal acquisition, and CAD of electromechanical microstructures. In terms of integrated systems IMT has also seen success in the implementation of implantable electrodes, neural interfaces, Wi-Fi communication, biocompatible materials. IMT employs 200 people with differing expertise in the fields of electronics, computer science, physics, chemistry, and biology. The institute is structured in 4 R&D centers, grouping 11 laboratories specialized in the following areas: Microsystems for biomedical and environmental applications; Nanobiotechnology; Molecular nanotechnology; Micro-nano photonics; Micromachined structures, microwave circuits and devices; Simulation, modelling, micro-and nano-fluidics; Reliability. More info at www.imt.ro.

Expertise:

The Laboratory of Microsystems for Environmental and Biomedical Applications (Head Dr. Carmen Moldovan), has been working for over 15 years on the development of biomaterials, formulations, biomarkers, sensors, transducers, implantable electrodes and microfluidic chips and systems (e.g organ on chip) for both biomedical and environmental applications. Some recent applications developed in the lab include sensors for the quantification of glucose in saliva, platforms for the early detection of myocardial infarct and the development of electrodes for an advanced arm prosthesis, energy harvesting devices for civil infrastructure security, aerospace or automotive applications, as well as a series of nanoelectronic sensors for monitoring of gases, water, and food, as well as the effect of their degradation on human health. Our team includes electrical engineers, physicists, biochemists and electrochemists, with a broad range of expertise covering aspects of design, simulation, experimental development, fabrication, testing and characterization.

Short CV of contact person:

George Muscalu, scientific researcher, graduated in Electronics and Telecommunications, from University "Politehnica" of Bucharest, holds a Master degree in Microsystems and he is a PhD student on piezoelectric energy harvester devices. Since 2014, when he joined the Laboratory for Microsystems in Biomedical and Environmental Applications at IMT-Bucharest, he was involved in the fabrication and testing of various MEMS devices like energy harvesters, supercapacitors or pesticides and gas sensors. Regarding the energy harvesters, his main focus was to integrate different thin film piezoelectric materials as AlN, AlScN, ZnO NWs, KNN or PZT with silicon technologies for device fabrication. The main focus was on civil infrastructure security, aerospace and automotive applications. George is/was involved in more than 7 EU projects and more of 10 National projects and his scientific activity was published in more than 13 papers (<https://www.scopus.com/authid/detail.uri?authorId=57156384700>).



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Calls of interest:

HORIZON-CL4-2023-RESILIENCE-01-33: Smart sensors for the Electronic Appliances market (RIA)

IMT will use its expertise in the development and manufacturing of smart sensors to develop sensor technologies based on novel substrates for the monitoring of pesticides on the food delivered to the EU population. The sensors could be integrated with a PoC platform.

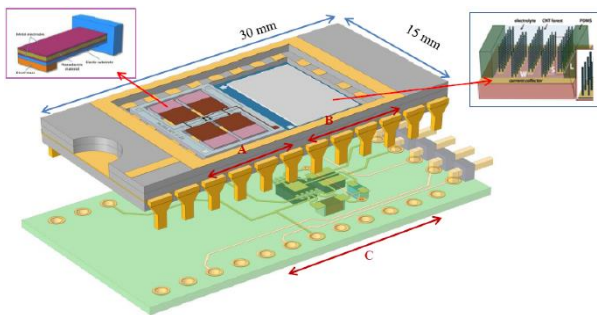
HORIZON-CL4-2023-DIGITAL-EMERGING-01-11: Low TRL research in microelectronics and integration technologies for industrial solutions (RIA)

IMT will use its expertise in the development and manufacturing of energy harvesting systems for ultra-low energy consumption. The focus will be on developing new materials and their integration with our current technology.

HORIZON-CL4-2024-SPACE-01-73: Space technologies for European non-dependence and competitiveness

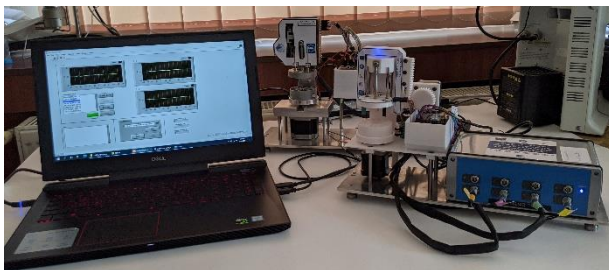
IMT will use its expertise in the development and manufacturing of materials and sensors for aerospace applications in order to reduce the dependence on technologies and capabilities from outside EU.

Previous EU funded projects:



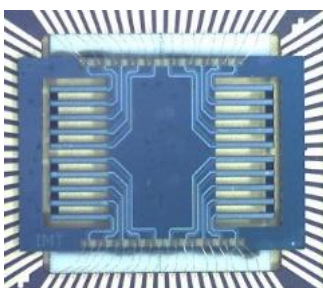
SmartEnergy (2021 – 2023)

M-ERA.NET H2020 project which will develop a high-efficiency, scalable and reconfigurable energy source through the integration of a piezoelectric energy harvester (A), an electronic circuit for signal rectifier from the energy harvester (C) and a supercapacitor for energy storage (B). The new energy source is dedicated for ultra-low-power sensors and it could replace conventional energy sources (batteries).



ORGANOPEST (2018 – 2020)

National project funded under the TGE-PLAT POC/77/08.09.2016 call. ORGANOPEST is an integrated and automated system for the detection of pesticides. The result consists in the testing and validation of the integrated system for detection of organophosphorus and organochlorine pesticides.



SENSIS-ICT (May 2019 – May 2021)

National project targeting the development of an piezoelectric energy micro-harvester for powering up sensors and portable microsystems.

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