IMT Bucharest
Main profile and achievements

IMT (Institute of Microtechnology) was set up in July 1993, being **the first with this profile in Eastern Europe.** In December 1996, IMT merged with the Research Institute for Electronic Components (ICCE) in order to establish the National Institute for R&D in Microtechnologies (IMT Bucharest).

The present field of activity of IMT-Bucharest is **micro and nanotechnologies**. The main research domain are: **RF-MEMS, photonics, nano-bio-technologies, including microsensors and micro-nanofluidics**.

The institute is coordinated by the **Ministry of National Education**, acting basically as an autonomous, nonprofit research company. As far as the participation to national and European projects is concerned, the institute is assimilated to a public research institution.

IMT Bucharest became visible at the national level, especially by coordinating various projects financed from the National Programmes. Between 2003 and 2012, the institute was involved in more than 25 European projects in FP6 and FP7, as well as in other categories of EU projects from COST Leonardo, ERANET, ENIAC (Joint Technology Initiative in Nanoelectronics) etc. The Report on Innovation (EC, 2011), *ranks IMT the first among more than 40 national R&D institutes*, as participation to EC is concerned. IMT hosts the **European Centre of Excellence in RF and Opto MEMS** (financed by EC, 2008-2011) and the **Centre for Nanotechnologies, CNT-IMT** (under the aegis of the Romanian Academy).

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The new **Research Centre for Integrated Systems Nanotechnologies and Carbon Based Nanomaterials CENASIC**.

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National Institute for R&D for Microtechnologies –
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A technological platform for integration of Key Enabling Technologies

provided by IMT-MINAFAB (www.imt.ro/MINAFAB)

IMT-MINAFAB

IMT centre for MIcro- and **NAno-FABrication (IMT-MINAFAB) was the first "open" research infrastructure in this field from Eastern Europe** (2009), providing access for research, education and industry, as clearly explained on the web page www.imt.ro/MINAFAB. Micro- and nanofabrication includes computer-aided simulation and design, mask fabrication, nanostructuring, physical characterization etc. The best results obtained are related to micro-nanosystems.

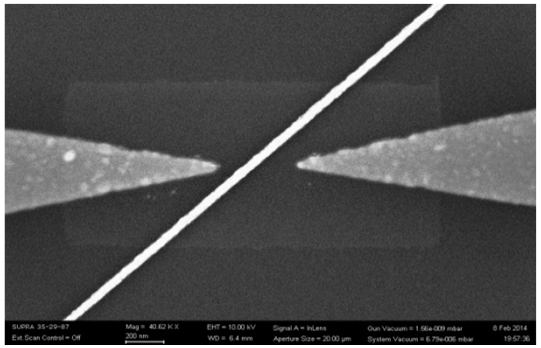
IMT is maintaining a regional advantage, because in 2013 it was the only **organization from Eastern Europe** selected to participate in EUMINAfab 2, a proposal for a network of "advanced nanofabrication", to be financed in "Horizon 2020".

In EUMINAfab2 IMT is offering Laser Lithography (2D and 3D patterning), Electron Beam Lithography (down to 20 nm), thin film technology (PECVD/LPCVD), plasma etching (RIE/DRIE), micro-nanoprinting, on wafer RF characterization up to 110 GHz, spectroscopy (FT-IR, Raman, fluorescence), X-ray metrology, reliability testing. What is essential behind the participation of IMT in a proposal aiming at "integration and opening of essential European infrastructures", it is the scientific expertise of researchers operating most of the complex equipments.

Integrating KETs

A technological platform for the integration of Key Enabling Technologies. This research infrastructure enabled IMT to extend its R&D capabilities, leading to participation in more demanding international projects (FP7, ENIAC) and to new contacts and collaborations with multinational companies operating in Romania (Honeywell, Infineon) and with other leading international partners. The main results achieved by IMT are in the field of the ***micro-nanoelectronics*** (more specifically micro-nanosystems) and ***photonics***, two of the **Key Enabling Technologies** (KETs). A new investment of 6 Meuro in the CENASIC centre (to be finalized in April 2015 will allow IMT to extend its existing capabilities in ***nanotechnologies*** and ***advanced materials***, another two KETs.

The strategic goal of IMT is to become a technological platform for integration of KETs, which is an important direction of development within EU programme for RDI, "Horizon 2020".



SEM photo of a ballistic FET based on a graphene monolayer, with an oblique gate.

CENASIC

The Research Centre for Integrated Systems Nanotechnologies and Carbon Based Nanomaterials (CENASIC) is a project devoted to the development of new technologies based on: **graphene, SiC and nanocrystalline diamond.** CENASIC provides an investment of 6.23 Meuro in building, facilities and equipment **(to be fully implemented until April 2015)**. The newly constructed 1000 sqm building, is organized in 4 levels: class 1000, 200sqm clean room (ground floor), technical level, 2 levels for labs and offices.

The 8 **experimental laboratories** (new or reinforced) are: Lab for Processing of Carbon based Nanomaterials and Nanostructures; Lab for Thermal Processes; Lab for Graphene Technology; Lab for Chemistry of Hybrid Interfaces; Lab for Thin Layer Spectrometry; Lab for Electro-mechanical Processes and Sample Preparation; Lab for Electromechanical Testing & Reliability; Laboratory for Simulation and design for carbon-based MEMS/NEMS.

The **key equipments** within the CENASIC are:

- Multiprocess Furnace System,
- Molecular Beam Epitaxy (MBE),
- Plasma Enhanced Chemical Vapor Deposition,
- Atomic Layer Deposition tool,
- RF Magnetron Sputtering.