



"Cooperation in nanotehnologies at the national level - experience of IMT"

Prof. D. Dascalu,
General Director of IMT-Bucharest



Key points related to IMT

- Field of R&D: Convergent technologies (micro-**nano**-bio)
- IMT as an open system
 - **Centre of nanotechnologies**
 - Nano-scale structuring and characterization
 - Multidisciplinary team
 - **IMT-MINAFAB**, a complex experimental infrastructure in micro- and nanotechnologies
 - Scientific networks (nucleating common labs etc.)
 - Companies (subsidiaries of important international companies in Romania, SMEs)
 - Education (M. Sc. and Ph.D. studies)



Participation in common projects with European partners

- Participation to more than 20 projects in FP6 and FP7
 - Coordinating 3 SSA on networking in micro- and nanotechnologies in Eastern Europe (2), Romania (1)
- Centre of excellence MIMOMEMS (RF and Opto MEMS), financed by EC (2008-2011)
- Other projects in ENIAC JU (2), ERA-NET, EUREKA, Leonardo etc.
- Associate European Laboratory (IMT/ANCS with LAAS/CNRS/France and FORTH/Heraklion/Greece)

NOTE: The participation of Romania European projects is comparatively strong in the “nano” field

- **“Building on European experience: nanoscience and nanotechnology”**, an workshop planned in Bucharest, on 3rd of February, 2010



Participation in national projects

- Coordination of about 30 research projects in nanotechnologies since 2005 (10% from the total number of projects in this field).
- Coordinator of 3 technological networks (2005-2008)
 - **RO-NANOMED** "Integrated Research Network Devoted to Nanobiotechnology for Health - Romanian Nanomedicine Network",
 - NanoBioLab
 - **NANOSCALE-CONV** "Network for Scientific Services for Structuring and Characterization at Nanometric Scale, with Applications in the Development of Convergent Technologies"
 - NanoScaleLab
 - **RTN-NANOEL** "Romanian Technological Network for integration in the European Platform for NANOElectronics (ENIAC)".
 - NanoScaleLab

Centre of excellence MIMOMES





MIMOMEMS



Sharing the equipments with
other laboratories

Center for Nanotechnologies (CNT) under the aegis of Romanian Academy an interdisciplinary group, involving a few RTD laboratories

The Centre for Nanotechnologies was represented before 2009 by a single “Laboratory for Nanotechnology” functioning as a Centre for Excellence for under the aegis of the Romanian Academy. Now the Centre joined the activity of the following laboratories:

- Laboratory of Nanotechnology
- Laboratory for Nanoscale structuring and characterization
- Laboratory for Molecular nanotechnology
- Dip pen nanolithography Laboratory
- Laboratory for Scientific services

The **main specific activities** of the centre consist in:

- Correlation on R&D activities and services of the laboratories involved, also offering technical and financial support
- Dissemination of the common offer towards potential partners and beneficiaries outside IMT-Bucharest

The laboratories offer state of the art facilities/ equipments concentrated in technological area in the form of experimental laboratories. Details www.imt.ro/CNT.



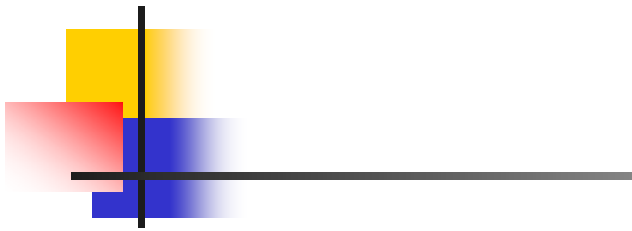


Centre of nanotechnologies: starting from **NanoScaleLab**
(emerging from a technological network)



Again expanding the
NanoScaleLab





Centre of nanotechnologies:
Another start from **NanoBioLab**

IMT support centre for Micro- and NAnoFABrication (IMT-MINAFAB)

IMT-MINAFAB is an interface created by IMT - Bucharest in order to fully exploit its tangible and intangible assets in micro- and nanotechnologies (clean-room facility, equipments, human resources, partners and clients). The so-called "fabrication centre" is in fact a complex technological platform including also CAD tools, characterization equipments, a mask shop, a reliability lab. The fabrication itself, whenever necessary, is accompanied by specific testing and design, as shown in the following examples:

- (i) the COVENTOR software package for modeling and simulation of microsystems provides design verification, as well as the direct input data for mask fabrication;*
- (ii) the on-wafer RF testing allows immediate testing of experimental RF components;*
- (iii) the nano-plotter and microarray scanner (NanoBioLab, in a clean room area) allows on-chip controlled deposition of biological molecules etc.*

Mission statement.

The micro- and nanofabrication centre from IMT-Bucharest will provide a platform of interaction devoted to multidisciplinary research and education-by-research, as well as to innovation and knowledge transfer to industry. As far as innovation is concerned, IMT-MINAFAB allows development of experimental models and prototypes, but also can support small scale production.

Although at the moment all resources are provided by IMT, MINAFAB plans to become a platform for sharing resources with partners, as well as the central place of a national network for knowledge and technology transfer in micro- and nanotechnologies.



Clean room: the mask shop





Clean room:
technological area



ROMANIAN NETWORK for Micro-and NANO FABRICATION

Network of experimental facilities in micro- and nanotechnologies

romnet-minafab@imt.ro

ROMNET – MINAFAB is the ROMANIAN NETWORK for Micro and NANO FABRICATION (www.imt.ro/MINAFAB/ROMNET). Just launched, in May 2009, this network consists of three Romanian institutes of research and development located in Bucharest:

- **National Institute of Research and Development in Microtechnologies (IMT-Bucharest)**

www.imt.ro

- **National Institute of Research and Development for Mechatronics and Measurement Technique (INCDMTM)-** www.incdmtm.ro

- **National Institute of Research and Development in Electrical Engineering (ICPE-CA)** www.icpe-ca.ro

All three institutes benefited recently from important investments in new equipments and they have a significant experience in cooperating with industry as well. As can be seen from this leaflet, these three partners are complementary, and their cooperation is increasing both the visibility for industry and the „critical mass” for complex projects.

ROMNET-MINAFAB orientation towards industry is targeting not only Romanian innovative SMEs, but also cooperation with foreign companies, some of them with subsidiaries in Romania.



Final

- Using the experience of European cooperation within the national R&D projects;
- Providing an experimental platform for interdisciplinary research
- Interaction with industry and with education;