

ANNEX 3

IMT and European cooperation

Early start

IMT-the Institute of Microtechnology was founded in 1993, being the first institute with this profile in Eastern Europe. Since 1994, microtechnologies (i.e. microsystem technologies, or MST) have been included in EU programmes.

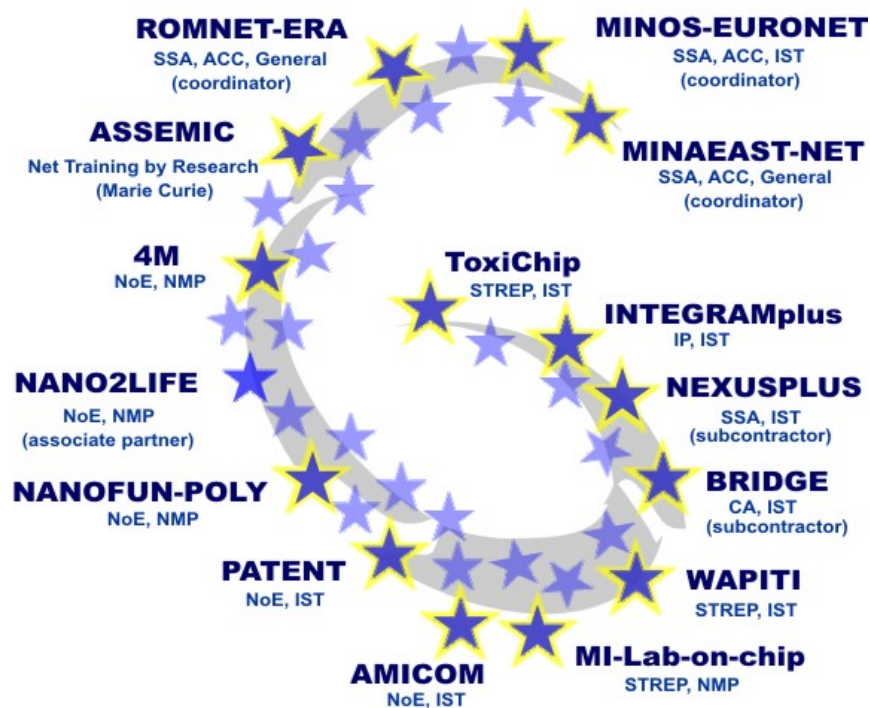
IMT was coordinating the European consortium of the MEMSWAVE project (1998-2001), the first European project coordinated by a country outside EU to be nominated for the Descartes Prize (the best European R&D project).

By that time (one decade ago) IMT had, however, a very poor infrastructure and suffered a lot from brain drain.

Gaining resources and experience of cooperation

The fast development taking place during the last decade was possible due to:

- the existence of MATNANTECH, a national R&D programme called “*New materials, micro- and nanotechnologies*”, and other national programmes involving topics related to the micro- and nanotechnologies;
- participation to European programmes, as illustrated below by the participation in FP 6.



A list of the FP 6 projects graphically illustrated above can be found in **Annex I** hereinafter.

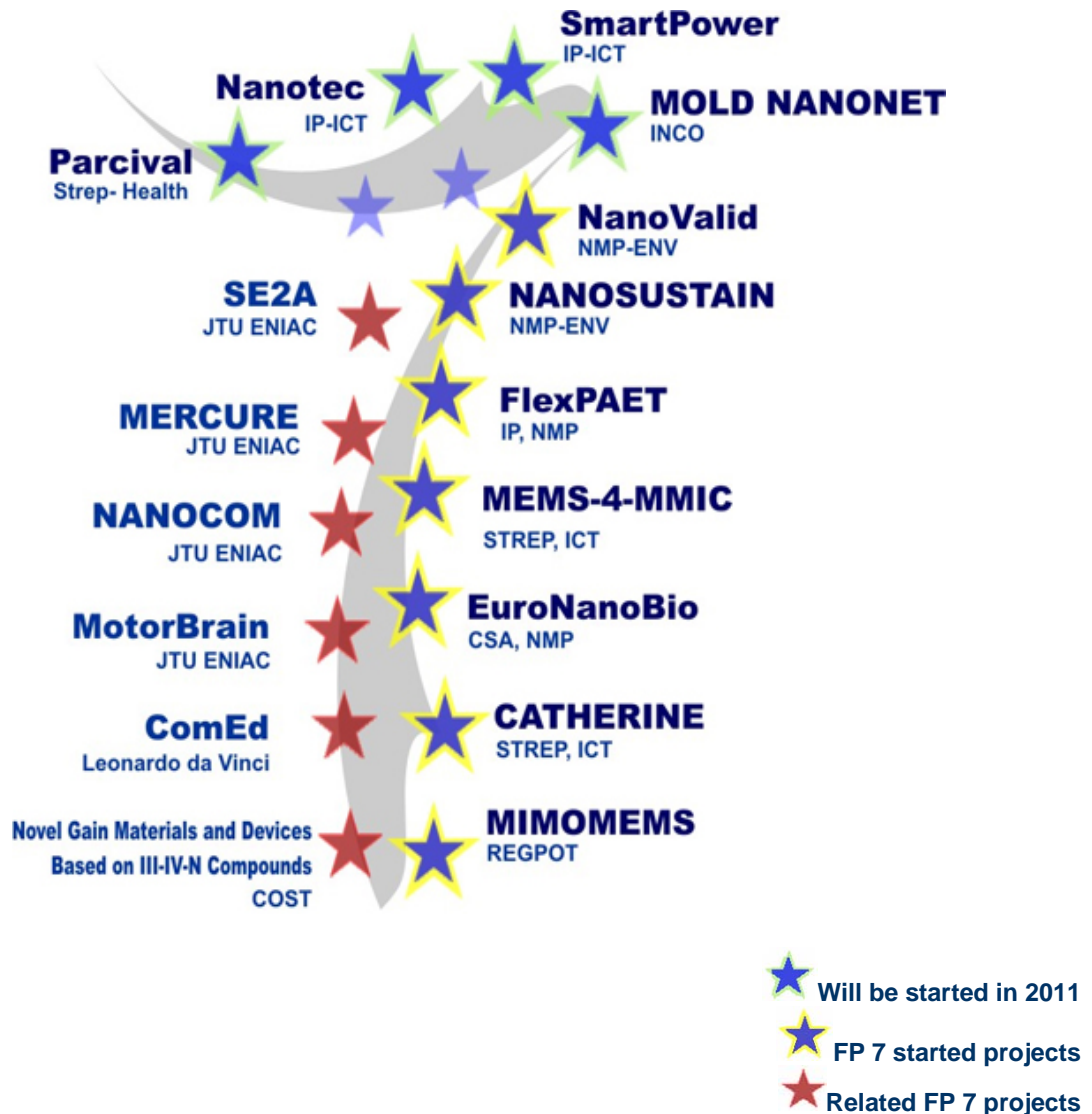
The main results of this period of development are:

- a new experimental infrastructure (about 7 millions euro invested in equipments and infrastructure 2006-2009)
- stabilization of scientific personnel.

Consolidating the position of IMT. A strategy for the future

The last period (2008-2011) can be characterized by:

- an even *stronger participation to European cooperation, with a diversification of projects*, from an European centre of excellence (MIMOMEMS) in FP7-REGPOT, to projects financed from public-private partnerships (ENIAC-JU, in nanoelectronics); the most important European projects in FP7 and related programmes are indicated in the figure below:



(a more complete list of project, with details, is presented in **Annex II** hereinafter);

- o an experimental facility open to cooperation in research, education, innovation (the “knowledge triangle”), i.e. IMT-MINAFAB (*IMT centre for Micro-and NAnoFabrication*) inaugurated in 2009; a substantial upgrading (2010-2013) by using structural funding, through the CENASIC project (an R&D centre devoted to carbon-based nanomaterials, unique in Europe);
- o investing in *human resources* (FP7 and structural funding); reintegrating Romanian researchers specialized abroad;
- o developing cooperation with *multinational companies* active in Romania (Honeywell Romania, Infineon Technologies Romania).

The present structure of IMT (since December 1st, 2010) incorporates the newest developments in Europe, as the integration of technologies or the innovative potential of materials. The visibility of IMT at the European scale is synthetically illustrated in **Annex III** hereinafter (milestones in the last seven years).

The experience of IMT in cooperation in European programmes (factors facilitating success)

- An early start in FP6 (where Eastern countries have had a “political” support);
- Credibility derived from previous participations;
- A certain stability of profile and policy;
- Openness for cooperation, irrespective of the immediate interest;
- Strong cooperation with certain key partners, playing a “pivotal” role in new proposals;
- Specific competences, required in certain calls;
- Powerful experimental infrastructure (in FP7);
- Financing in national programmes of specific sub-domains, correlated with FP6, FP7 priorities;
- Networking at the national scale (increasing the interest for Romania in general);
- Appropriate tools for dissemination of information (electronic tools, printed material).

Annex I: Participation of IMT-Bucharest in FP6 projects

FP6 projects coordinated by IMT-BUCHAREST

1. ROMNET-ERA ROManian Inventory and NETworking for Integration in ERA (www.romnet.net).

The ROMNET- ERA proposal addresses three strategic objectives of the ACC SSA General call, with the main emphasis on networking between the high quality research centers. The activities concentrate on Romania, preparing its integration in ERA. Restructuring for integration in ERA will be the only realistic chance of the Romanian research to become competitive. The project consortium has the competence and the authority to address the local scientific community and has the full support of national authorities. The important target groups at the national level are: high-quality research centers, and innovative SMEs. Identifying, screening and networking of research groups (from three separate research systems: national R&D institutes, university research centers, research units of the Romanian Academy) will be focused on some priorities of FP 6, catalyzing the participation to EU projects.

Coordinator: Acad. Dan Dascalu (dan.dascalu@imt.ro)

2. MINAEAST-NET "Micro and Nanotechnologies going EAST through NETworking" - (www.minaeast.net)

A project financed by the European Commission (2004-2006) focused on networking in Eastern Europe (new member states and candidate countries for EU). Information is disseminated through the web page and Bulletin of Micro and Nanotechnologies (www.imt.ro/mnt).

Coordinator: Acad. Dan Dascalu (dan.dascalu@imt.ro)

3. MINOS-EURONET "Micro-NanOSystems EUROpean NETwork pursuing the integration of NMS and ACC in ERA"- (www.minos-euro.net).

A project financed by the European Commission (2005-2008). MINO-EURONET is devoted to stimulating, encouraging and facilitating the participation of New Member States (NMS) and the Associated Candidate Countries (ACC) in the activities of IST. The proposal has a pan-European focus on one strategic objective in IST, namely micro- and nanosystems. In strictly conformity with the call, the proposal is addressing the following objectives: (1) Revealing and promoting the research competences from NMS and ACC, namely competences which are relevant for the development of the field of micro-nanosystems at the European scale; (2) Facilitating the participation of NMS and ACC organisations to EU programmes and other activities in the field of micro-nanosystems; (3) Performing extensive networking at the pan-European scale in the field of micro-nanosystems.

Coordinator: Acad. Dan Dascalu (dan.dascalu@imt.ro)

FP6 projects- IMT-Bucharest- partner

1. **AMICOM-Advanced MEMS for RF and Millimeter Wave Communications** (2004-2007)
NoE, IST, Project No. 507352
Coordinator: LAAS-CNRS Toulouse (France)
IMT role: partner - Dr. Alexandru Muller (alexandru.muller@imt.ro)
Project site: <http://www.amicom.info/>
2. **ASSEMIC-Advanced Handling and Assembly in Microtechnology** (2004-2007)
Marie Curie Research Training Network , MOBILITY, Project No. 504826
Coordinator: Institut fur Mikro-und Feinwerktechnik, Technische University Wien (IMFT) (Austria)
IMT role: partner - Dr. Raluca Muller (raluca.muller@imt.ro)
3. **4M-Multi-Material Micro Manufacture: Technologies and Applications** (2004-2009)
NoE, NMP, Project No.500274
Coordinator: Cardiff University (UK)
IMT role: partner - Dr. Carmen Moldovan (carmen.moldovan@imt.ro)
Project site: <http://www.4m-net.org/>
4. **NANO2LIFE-A network for bringing NANOTEchnologies TO LIFE** (2004-2008)
NoE, NMP, Project No. 500057
Coordinator: CEA (France)
IMT role: partner - Dr. Irina Kleps (irina.kleps@imt.ro)
Project site: <http://www.nano2life.org>
5. **NANOFUN-POLY-Nanostructured and Multi-Functional Polymer-Based Materials and Nanocomposites** (2004-2008)
NoE, NMP, Project No. 500361
Coordinator: Italian Consortium for Science and Technology of Materials (INSTM) (Italy)
IMT role: partner - Dr. Irina Kleps (irina.kleps@imt.ro)
Project site: <http://www.nanofun-poly.com>
6. **PATENT DfMM-Design for Micro & Nano Manufacture (Packaging, Test and Reliability Engineering in Micro & Nanosystem Technologies)** (2004-2008)
NoE, IST, Project No. 507255
Coordinator - University of Lancaster (UK)
IMT role: partner - Dr. Marius Bazu (marius.bazu@imt.ro)
Project site: <http://www.patent-dfmm.org>
7. **WAPITI-Waferbonding and Active Passive Integration Technology and Implementation** (2004-2007)
STREP, IST, Project No. 004073
Coordinator - Fraunhofer Institute for Telecommunications, Heinrich Hertz-Institut (Germany)
IMT role: partner - Dr. Dana Cristea (dana.cristea@imt.ro)
8. **MI-lab on chip-Lab-On-A-Chip Implementation of Production Processes for New Molecular Imaging Agents** (2005-2008)
STREP, NMP, Project No. 516984
Coordinator: TRASIS SA (Belgium)
IMT role: partner - Dr. Oana Nedelcu (oana.nedelcu@imt.ro)
9. **NEXUSPLUS-NEXUS-Supporting IP's and NOE's ensuring SME representation and introducing NAS partners** (2004-2008)
SSA, IST, Project No. 507293
IMT role: partner - Dr. Carmen Moldovan (carmen.moldovan@imt.ro)
Project site: <http://www.nexus-mems.com/>
10. **BRIDGE-Europractice - coordination of proactive NAS interaction and an awareness dissemination and exploitation bridge** (2004-2008)
CA, IST, Project No. 507307
Coordinator: Rutherford Appleton Laboratory (UK)
IMT role: partner, subcontractor - Dr. Carmen Moldovan (carmen.moldovan@imt.ro)
Project site: http://www.te.rl.ac.uk/europractice_com/partners/bridge.html

11. **INTEGRAMplus-Multi-domain platforms for integrated micro-nano technology systems** (2006-2008)

SA, IST, Project No. 027540

Coordinator: QinetiQ Ltd (UK)

IMT role: partner - Dr. Carmen Moldovan (carmen.moldovan@imt.ro)

Project site: <http://www.integramplus.com/>

12. **ToxiChip-Development of a toxin screening multi-parameter on-line biochip system** (2006-2009)

STREP, IST, Project No. 027900

Coordinator - Tyndall National Institute (Ireland)

IMT role: partner - Dr. Carmen Moldovan (carmen.moldovan@imt.ro)

Project site: <http://www.toxichip.org>

Annex II: Participation of IMT-Bucharest in FP7 projects, and in related European programmes

FP7 projects coordinated by IMT-BUCHAREST

1. **MIMOMEMS-European Centre of Excellence in Microwave, Millimetre Wave and Optical Devices, based on Micro-Electro-Mechanical Systems for Advanced Communication Systems and Sensors** (2008-2011)

REGPOT, Project No. 202897

Contact: Dr. Alexandru Muller (alexandru.muller@imt.ro)

Project web site: <http://www.imt.ro/mimomems>

FP7 projects- IMT-Bucharest- partner

2. **SMARTPOWER-Smart integration of GaN & SiC high power electronics for industrial and RF applications** (2011 – 2014)

ICT, Collaborative Project, Project No. 288801

Coordinator: Thales SA - Thales Research & Technology (France)

IMT role: partner - Dr. Alexandru Muller (alexandru.muller@imt.ro)

3. **NANOTEC-Nanostructured materials and RF-MEMS RFIC/MMIC technologies for highly adaptive and reliable RF systems** (2011 – 2014)

Coordinator: Thales SA - Thales Research & Technology (France)

IMT role: partner - Dr. Alexandru Muller (alexandru.muller@imt.ro)

4. **PARCIVAL-Partner Network for a Clinically Validated Multi-Analyte Lab-on-a-Chip Platform** (2011-2014)

STREP, HEALTH, Collaborative Project, Project No. 278090

Coordinator: PathoFinder BV (The Netherlands)

IMT role: partner - Dr. Carmen Moldovan (carmen.moldovan@imt.ro)

5. **NanoValid-Development of reference methods for hazard identification, risk assessment and LCA of engineered nanomaterials** (2011-2015)

NMP, Large-scale integrating Collaborative Project, Project No. 263147

Coordinator NordMiljö AB (NOMI) (Sweden)

IMT role: partner - Dr. Mihaela Miu (mihaela.miu@imt.ro)

6. **MOLD NANONET-Enhancing the capacities of the ELIRI Research Institute in applied research to enable the integration of Moldova in the European Research Area on the basis of scientific excellence** (2011-2014)

INCO, Support Actions, Project No. 294953

IMT role: partner - Dr. Mircea Dragoman (mircea.dragoman@imt.ro)

7. **NANOSUSTAIN-Development of sustainable solutions for nanotechnology-based products based on hazard characterization and LCA** (2010-2013)

NMP, Small or medium-scale focused research project, Project No. 247989

Coordinator: NordMiljö AB (NOMI) (Sweden)

IMT role: partner - Prof. Dan Dascalu, (dan.dascalu@imt.ro)

Project site: <http://www.nanosustain.eu/>

8. **EuroNanoBio-European scale infrastructure in NanoBiotechnology** (2009-2010)

NMP, Support Actions, Project No. 231654

Coordinator: CEA (France)

IMT role: partner - Prof. Dan Dascalu (dan.dascalu@imt.ro)

9. **MEMS-4-MMIC-Enabling MEMS-MMIC technology for cost-effective multifunctional RF-system integration** (2008-2011)

ICT, Collaborative Project, Project No. 224101

Coordinator: IMST GmbH (Germany)

IMT role: partner - Dr. Dan Neculoiu (dan.neculoiu@imt.ro)

Project site: <http://www.mems4mmic.com>

10. **CATHERINE-Carbon nAnotube Technology for High-speed nExt-geneRation nano-InterconNEcts** (2008-2011)

ICT, Collaborative Project, Project No. 216215

Coordinator: Consorzio Sapienza Innovazione (Italy)

IMT role: partner - Dr. Adrian Dinescu (adrian.dinescu@imt.ro)

11. **FlexPAET-Flexible Patterning of Complex Micro Structures using Adaptive Embossing Technology** (2008-2010)

NMP, Large-scale integrating Collaborative Project, Project No. 214018

Coordinator: Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V. Fraunhofer Institut für Produktionstechnologie (IPT) (Germany)

IMT role: partner - Dr. Dana Cristea (dana.cristea@imt.ro)

Related FP 7 projects

Participation in JTU ENIAC:

1. **SE2A-Nanoelectronics for Safe, Fuel Efficient and Environment Friendly Automotive Solution** (2009-2012)

ENIAC- 2008-1, Project No. 120009

Coordinator: NXP Semiconductor Netherlands BV (The Netherlands)

IMT role: partner - Dr. Alexandru Muller (alexandru.muller@imt.ro)

Project site: <http://www.eniac-se2a.com/>

2. **MERCURE-Micro and Nano Technologies based on wide band gap materials for future transmitting receiving and sensing systems** (2010-2013)

ENIAC- 2009-2, Project No. 120220

Coordinator: Thales Research and Technology (France)

IMT role; partner - Dr. Alexandru Muller (alexandru.muller@imt.ro)

Project site: <http://www.project-mercure.com/>

3. **NANOCOM-Reconfigurable Microsystem Based on Wide Band Gap Materials, Miniaturized and Nanostructured RF-MEMS** (2011-2014)

ENIAC-2010-3

Coordinator Thales Research and Technology (France)

IMT role: partner - Dr. Alexandru Muller (alexandru.muller@imt.ro).

4. **MotorBrain-Nanoelectronics for Electric Vehicle Intelligent Failsafe Drive Train** (2011-2014)

ENIAC-2010-3

Coordinator: Infineon AG (Germany)

IMT role: partner - Dr. Gabriel Moagar-Poladian (gabriel.moagar@imt.ro).

COST projects

1. **Novel Gain Materials and Devices Based on III-V-N Compounds** (2009-2012)

Contract: Action MP0805,

Coordinator: University of Essex (UK)

IMT role: partner - Dr. Alexandru Muller (alexandru.muller@imt.ro)

Leonardo da Vinci projects

1. **ComEd-Development of competences of educational staff by integrating operational tasks into measures of vocational training and further education** (2008-2010)

Leonardo da Vinci, Project No. DE/08/LLP-LdV/TO/147174

Coordinator: BWAW Thüringen GmbH, (Germany)

IMT role: partner - Dr. Raluca Muller (raluca.muller@imt.ro)

Project site: www.comed-project.eu

MNT ERA-NET projects

1. **DNASIP-A “system-in-a-microfluidic package” approach for focused diagnostic DNA microchips** (2008-2010)

Coordinator: Université catholique de Louvain, Belgium

IMT role: partner - Dr. Monica Simion (monica.simion@imt.ro)

2. **NANOCAFE-Nanostructural carbonaceous films for cold emitters** (2009-2011)

MNT ERA-NET Call 2009

Coordinator: Industrial Institute of Electronics (Poland)

IMT role: partner - Phys. Florea Craciunoiu (florea.craciunoiu@imt.ro)

3. **MULTINANOWIRES-Multifunctional Zinc oxide-based nanostructures: from materials to a new generation of devices** (2010-2012)

MNT ERA-NET Call 2009

Coordinator: CEMIMAT/I3N,FCT-UNL (Portugal)

IMT role: partner - Dr. Alexandru Muller (alexandru.muller@imt.ro)

4. **MEMIS-MEMS Based Millimetrewave Imaging System** (2010-2012)

MNT ERA-NET Call 2009

Coordinator: LAAS Toulouse (France)

IMT role: partner - Dr. Alexandru Muller (alexandru.muller@imt.ro)

5. **PESTIPLAT- Integrated Platform for Pesticides Detection** (2010-2013)

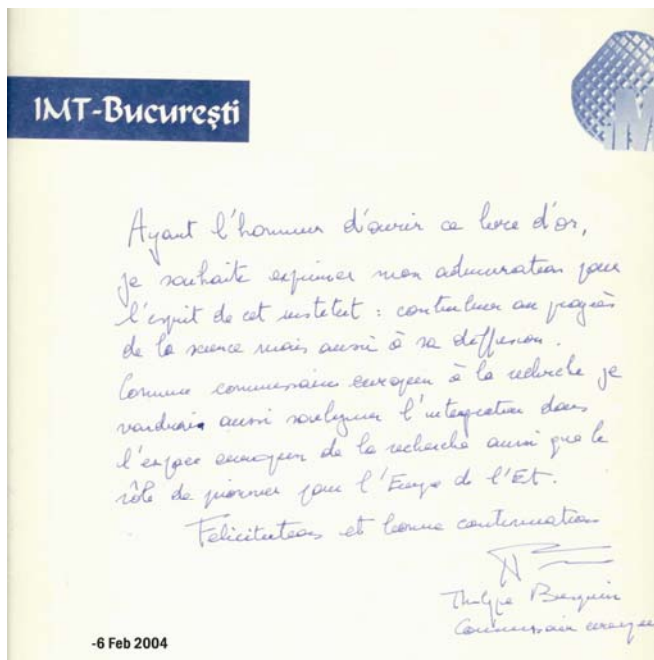
MNT ERA-NET Call 2010

Coordinator: IMT-Bucharest - Dr. Carmen Moldovan, (carmen.moldovan@imt.ro)

Annex III: Milestones: the last seven years

2004: A visit to remember: Mr. PHILIPPE BUSQUIN, the European Commissioner for Research, in IMT.
 (IMT-Bucharest on 6th of February 2004)

The Commissioner appreciated IMT as:
 "... a pioneer of integration in ERA in Eastern Europe".



Dr. Alexandru Muller, nominated for the Descartes Prize (2002), is presenting to the Commissioner the newest results in RF-MEMS obtained with partners which founded AMICOM (NoE financed by FP 6).

2011: Innovation Union Competitiveness report of EC

From the Annex Country profile Romania

TABLE 5 RO - Romania - Most active organisations in terms of EC contribution granted to the FP7 research projects

Legal Name	Number of Participations	% of all RO grant holders	EC contribution (M euro)	% of total EC contribution to RO grant holders
Universitatea Politehnica Din Bucuresti (UPB)	30	5.58%	6.93	9.58%
Institutul de Chimie Macromoleculara Petru Poni (ICMPP)	7	1.30%	3.54	4.89%
Universitatea Tehnica Cluj-Napoca (UTC)	16	2.97%	2.77	3.82%
Primaria Municipiului Iasi (IASI)	1	0.19%	2.38	3.29%
Institutul National de Cercetaredezvoltare Pentru Microtehnologie (IMT)	6	1.12%	1.98	2.73%

