



Cooperation in industry-oriented research in an enlarged Europe



Info- and brokerage event in new technologies and materials

(FP7/2007: NMP/ICT)



Calls (topics) of Interest for 2007 on ICT and NMP:

- ▶ ICT-2007.3.1: Next-Generation Nanoelectronics Components and Electronics;
- ▶ ICT-2007.3.6: Micro/nanosystems
- ▶ NMP-2007-4.0-3 Multifunctional materials for future vehicles

IMT-Bucharest

Simulation Modeling and Computer Aided Design Laboratory

Contact Person:
Dr. Raluca Muller (ralucam@imt.ro)

Experience in European projects 2003-2006

- MI-Lab-on-chip—STREP – NM, Contract 516984 (2005-2007) Contact: Oana Nedelcu (oanan@imt.ro)
- PATENT-DfMM ("Design for Micro and Nano Manufacture") – FP6 IST NoE- Contract .507255 (2004-2007), (5 grants in WP2-Modelling and Simulation) Catalin Tibeica (catalint@imt.ro); Victor Moagar – Poladian (victorm@imt.ro), Irina Codreanu (irinac@imt.ro)
- ASSEMIC Marie Curie RTN- Contract 504826 (2004-2007); Contact: Raluca Müller (ralucam@imt.ro)

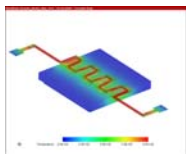
Competence resources

▶ **Main expertise area:** CAD using FEM, FVM, BEM: structural, mechanical, thermal, electric and magnetic field analysis, coupled field analysis; design development and optimization of MEMS, MOEMS components and devices, simulation and design of microfluidic components for biomedical applications; neural networks; nanostructures; conceiving and modelling of novel optoelectronic devices

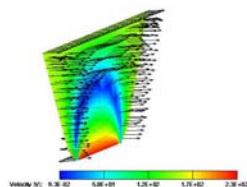
▶ **Simulation and modeling** activities oriented to collaborative research projects, education (short courses, seminars, workshops) and consulting (design/optimization).

Facilities:

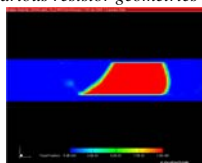
- Simulation software **COVENTORWARE 2006** (Mask Design, Process Editor, 3D construction and mesh; modeling for technological processes/optimizations)
- Finite element method software **ANSYS**
- Programming tool **MatLab 7.0**
- Multiprocessor workstation**
- Training room** equipped with a computer network, used also for design and simulation with specific software packages



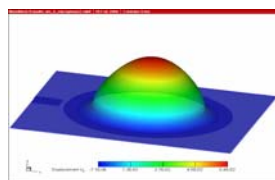
Electrothermal heating: simulation for various resistor geometries



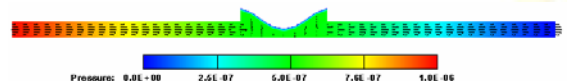
Velocity distribution in a microchannel



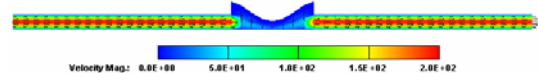
Simulation of droplet transport under an applied voltage of 60V



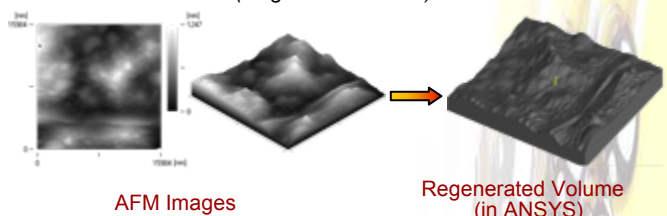
Displacement of a membrane of a capacitive microphone structure, under acoustic pressure (120 dB) (exaggerated displacement)



Pressure distribution along the channel and chamber (longitudinal section)



Velocity distribution along the channel and chamber (longitudinal section)



AFM Images

Regenerated Volume (in ANSYS)

Interest for cooperation

▶ advanced simulation, modeling and CAD for:

- micro- and nano devices (MEMS, NEMS)
- microfluidics (components: micro-pumps and microvalves; flow in microchannels: thermal flow, fluid mixing, thermal analysis, electro-kinetic); microfluidics for lab-on-chip
- materials (determination of material parameters using FEM);
- hard biological tissues
- optimization of specific technological processes

▶ application of simulation techniques to the Design for Manufacturing concept (DfM)

▶ training activities for Design and simulation of MEMS and microfluidic structures with CAD Techniques.

▶ technical support

Further info on-line Brokerage:

www.minos-euro.net/brokerage