



Partners

1 Microphotonics Laboratory IMT-Bucharest Optoelectronics Research
1 Centre "Politehnica" University, Bucharest

Coordinator:

Dr. ing. Dana Cristea IMT-Bucharest
(email: danac@imt.ro)

Financed by: RELANSIN - Project No. 993 (2001-2003)

Mission

1 to create a centre of excellence in the field of the development of micro- and nano-photonics and MOEMS
1 to create a centre of education in the field of microphotonics

Expression of Interest: EOI-FP6.2002 - P O E M: Network of Excellence- Photonic and Opto-Electronic Microdevices

Main partners: Koç University - Turkey; Univ. of Twente -The Netherlands; Univ. of Trento - Italy; Univ. of Glasgow - UK; Univ. of Wuppertal - Germany; Sheffield Univ. - UK; Academy of Science - Czech Republic

Facilities

- soft ware simulator for photonic circuits and structures, photonic band-gap materials and devices, micro-optical elements based on based on FDTD method,
- modeling software for semiconductor heterostructures
- technological facilities for non-standard processes

Expertise in:

- 1 modelling and simulation of micro and nano optoelectronic and photonic devices
- 1 Design, modelling, fabrication and characterization of optoelectronic integrated circuits and MOEMS
- 1 Development of components for photonic integrated circuits (waveguides, interferometers, couplers, and special photodetectors) based on different materials (silica, SiON, organic and polymeric materials)
- 1 micromachining technologies for MOEMS

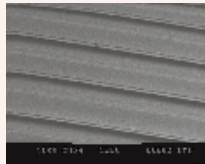
International co-operation

Development of micro-electro-mechanical systems (MOEMS) based on integrated optics and silicon micromachining - Bilateral research program with Open University of Athens, Department of Optical, Athens, Greece

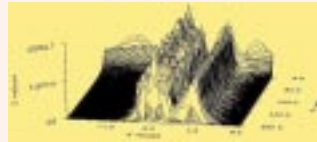
Silicon-based integrated optics and MOEMS - Inter-academic co-operation with Laboratoire de Physique des Composants a Semiconducteurs - CNRS, ENSERG, Grenoble, France

Microphotonic components obtained using anisotropic etching of <111>-oriented Si wafers

Si and Si₃N₄/SiO₂ /Si -rib waveguide for optical communication or interconnects in the range 1.3 - 1.55 mm



SEM image



3D electric field distribution of the TE modes



Photonic integrated circuit composed of photodetectors coupled to waveguides



MSM photodetector based on poly-Si thin layers integrable with optical waveguides



SiO₂ diaphragms for Fabry-Perot interferometers

Publications (2000-2002)

- 1 Materials Science & Engineering B, Vol. B74 (2000), pp 89-95
- 1 Microelectronic Engineering, Vol. 51-52, pp 393-400, 2000.
- 1 Materials Science in Semiconductor Processing, vol. nr. 5/6 (2000).
- 1 Thin Solid Films, vol. 383/1-2, 2001, pp. 284-286
- 1 Optical Materials, vol. 17/1-2, 2001, pp. 201-205.
- 1 Sensors and actuators A99 (2002), pp. 92-97

CHARACTERIZATION OF MATERIALS AND STRUCTURES FOR MICRO AND NANOENGINEERING RESEARCH LABORATORIES NETWORK - MINAMATNET

Contact persons: Acad. Dan Dascalu (dascalu@imt.ro);
Dr. Raluca Müller (ralucam@imt.ro)

MINAMAT-NET is a national Romanian network set-up in October 2001 and co-ordinated by IMT-Bucharest, which groups 8 partners ("Costin D. Nenitescu" Foundation, National Institute for Research and Development for Materials Physics, National Institute for Research and Development for Lasers, Plasma and Radiation, Institute for Nuclear Research, Institute of Physical Chemistry, "I.G. Murgulescu" of the Romanian Academy, University of Bucharest, Faculty of Physics, Advanced Research and Development Institute for Electrical Engineering). The laboratories involved have complementary equipments and expertise in the field of characterization of materials and microstructures for micro and nanoengineering. The activity of the network is supported by the project No.77

(2001-2004) from the Romanian National Programme MATNANTECH.

The main objective of the network is to promote a multidisciplinary research and develop new characterization services related to the characterization of materials, micro and nanostructures.

The main activities of the network are:

- a co-operation in microphysical and chemical characterization, new phenomena and new principles, new characterization techniques, functional characterization, development of dedicated microstructures for specific characterization - lab on a chip, characterization of new materials - nanomaterials;
- teaching activities (lab for students, stages, tutorials, courses), training by research;
- exchange of information with potential users;
- access to the EXIRANET services: data base

In its first year of activity the network identified the partners' resources, organized courses etc.

CESME - CENTRE OF SERVICES, TRAINING, AND CONSULTANCE IN MICROENGINEERING

MATNANTECH Project No. 30/2001 (2001-2004), coordinated by the National Institute for Research and Development in Microtechnologies (IMT-Bucharest), with partners from industry and academia.

The main scope of the CESME project is to increase the range of services of the consortium, as well as to stimulate the interests of

users (in micro-electro-mechanical systems and microelectronics) in order to increase the professional competitiveness and to facilitate the access to fabrication.

The consortium is offering: training, assistance and consultancy in: microfabrication; microphysical characterization; - CAD and simulation for MOEMS and microfluidic microsystems; design and simulation in microelectronics; RF-MEMS design and simulation; design in microphotonics; testing and improving reliability.