

Nanostructured and Multi-Functional Polymer-Based Materials and Nanocomposites NANOFUN-POLY

**Coordinator: Prof. Jose M. Kenny, Italian Consortium for Science and Technology of Materials (INSTM)
NoE FP 6 - priority 3, NMP**

NANOFUN-POLY joins forces of 25 partners from European countries, and combines knowledge and expertise from chemistry, physics, and engineering, covering experimental and applied aspects of materials science (www.NANOFUN.NET).



The research areas of excellence of NANOFUN-POLY network are:

Area 1. Polymer Chemistry: new monomers; new precursors (copolymers, dendrimers, hyperbranched polymers, microgels, nanoclusters); polymerisation routes - chain polymerisation, polycondensation, free radical and radical polymerisation, sol-gel, etc.; and formulation.

Area 2. Polymer Processing: intelligent and integrated processing; environmentally friendly processing techniques; processing nanocomposites; coatings; patterning of polymer surfaces.

Area 3. Nanostructure-Property Relationships: new techniques of nanoscale characterization; rheology at different scales; molecular modelling and related simulation techniques.

Area 4. Applications: mechanical systems; functional coatings; membranes; optical and electrical devices; bioactivity

The specific applications of the POLYMERIC MATERIALS in the MICRO-NANOTECHNOLOGY field are: Sensors and biosensors; Nanomaterials/ nanostructures with various application in medicine and environment; Optoelectronics based on polymers and composite materials; Field emission devices with carbon nanoparticles embeded in polymeric films; Microwave devices; Photolithographic polymers; Polymers with functional properties: conductive, semiconductors dielectrics, optical active, photosensitive, photocromics, sensitive, magnetics, field emission, biodegradable, biocompatible, hydrophylic, organometalics, etc.; Polymeric films as support for nanoparticles; Protective polymers.

Romanian Partners:

- NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN MICROTECHNOLOGIES IMT-BUCHAREST General Manager: Prof. Dan Dascalu (dascalu@imt.ro), Project coordinator: Dr. Irina Kleps (irinak@imt.ro);
- NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT FOR ISOTOPIC AND MOLECULAR TECHNOLOGIES (Group of the Conductive polymers), Cluj-Napoca; General Manager: Dr. Mircea Bogdan; Project coordinator: Dr. Rodica Turcu (turcu@s3.itim-cj.ro)

Design for Micro & Nano Manufacture PATENT (Packaging, Test and Reliability Engineering in Micro & Nanosystem Technologies)

**Coordinator - University of Lancaster, UK; Dr. A Richardson (A.Richardson@Lancaster.ac.uk)
NoE FP 6 - priority 2, IST**

PATENT is a reactive initiative that will attempt to realise the vision of providing innovators whether they be members of small companies, universities or multinationals a "predictable" route from M&NT based product concept to product. This will be achieved by realising in the medium to long-term a new concurrent engineering or Design for Micromanufacture Methodology (DfMM) methodology for M&NT-based products that provides designers with the means to design for performance, testability, robustness and dependability competitively, whatever the operating environment. To achieve this vision, major technical challenges need to be solved that are both technically difficult and require workable cross-disciplinary teams. PATENT will address these challenges by:

- Providing experts with the incentive and resources to cooperate in solving key technical challenges in the fields of modelling and simulation, test engineering, reliability engineering and package engineering.
- Encourage cooperation across these fields and application domains to help realise a new DfMM methodology for M&NT based products.
- Realising critical mass of expertise through the formation of a "virtual institute" across Europe that develops, coordinates and delivers training programs for internal staff and the community.

PATENT participants:

- Coordinator - University of Lancaster, UK
- University of Bremen, Germany
- IMEC, Leuven, Belgium
- Universite Paris-sud, Orsay
- LIRMM, Montpellier, France
- University College Cork, Cork, Ireland
- QinetiQ Sensors and Electronics, Malvern,
- National Institute for Microtechnologies Bucharest, Romania,
- System Level Integration Limited, Scotland
- 4M2C, Berlin
- Fraunhofer Institute for Reliability and Microintegration IZM, Berlin
- Fraunhofer-Gesellschaft e.V.- Dresden
- LAAS - Paul Sabatier University, Toulouse
- Katholieke Universiteit Leuven, Belgium
- Budapest University of Technology & Economics
- THALES, Paris
- Heriot Watt University, Edinburgh, UK,
- Council for the Central Laboratory of the Research Councils, UK,
- Dipartimento di Ingegneria Strutturale. Politecnico di Milano, Italy
- Fraunhofer Institute for Reliability and Microintegration Munich, Germany
- Warsaw University of Technology, Poland
- Centre Spatial de Liege, Belgium
- IXL University Bordeaux 1
- MESA Research Institute, Twente

