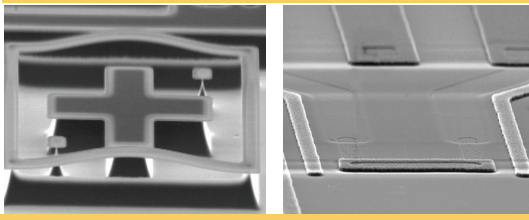


Nano Toolshop Ltd. SME, Bulgaria

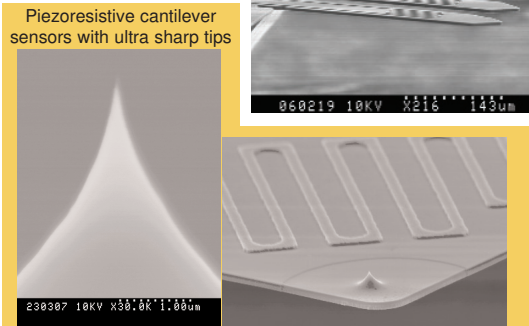


NTS proposal/ interest

Competence in MEMS technology



Piezoresistive cantilever sensors and sensor array for chemical and biochemical recognition



Piezoresistive cantilever sensors with ultra sharp tips

NTS proposal/ interest

**NMP-2007-1.2-2 Equipment and methods for nanotechnology:** Having expertise in development and prototype manufacturing of advanced MEMS devices, NTS will contribute development of new analytical and control systems, operating in nano-scale with enhanced sensitivity and resolution, by introducing of new application specific sensors, as well as new functionalization techniques and consumables. NTS is interested in fast assessment of existing/newly proposed methods in respect to their practical relevance, within the project cooperation.

**NMP-2007-1.2-4 Coordination in nanometrology:** NTS will provide novel nano-probe techniques based on recently developed methods, able to measure multiple nano-scale characteristics with enhanced resolution, simultaneously.

**NMP-2007-1.3-1:** Specific, easy-to-use portable devices for measurement and analysis

Providing application specific self-sensing, self-actuated cantilever sensors for measurement/recognition of complex characteristics, NTS will contribute innovation process of new portable measuring and analytical devices. NTS is looking for cooperation in development of portable devices using novel/modified sensors with significantly improved parameters and performance. Small smart stand-alone low-powered and wire-less systems for hazard monitoring, are of special interest.

**NMP-2007-2.1-3:** Characterisation of nanostructured materials  
Development of new parallel SPM techniques, based on cantilever sensors and capable to measure more than one characteristic, simultaneously. Company is interested in standardization of functionalization methods and techniques.

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Department of Microelectronics, Faculty of EE & IT, Slovak University of Technology in Bratislava, Slovakia

Proposal/Interest

Staff members of the Microelectronics Dept of the STU FEI are interested and ready to use their expertise, skills and knowledge either within ICT and NMP objectives specified in FP7 themes or within any other R&D collaboration.

**Our proposal:** The main objective is to develop new materials and technologies for the fabrication of miniature, intelligent, low power consumption gas sensing microsystems.

The research and development of novel gas sensitive nanomaterials and sophisticated GaAs based micro-electro-thermo-mechanical systems with low thermal conductivity.

Modeling and simulations of mechanical and thermal properties for monolithic integrated gas sensing microsystem.

**Potential areas for collaboration:** thin film technology (nanotechnology) and microsystem technology for gas micromachined sensors.

**Potential promoting from partners:** analysis, testing, quantification of gas sensor structures in controlled atmospheres in gas mixing stations.

**ASIC design:** ♦ using EUROPRACTICE, focused mainly on testing and design for testability; ♦ On-chip supply current monitoring (IDDQ, Idtd – co-inventor of 2 EU/US patents) for VLSI digital systems. Optimized for submicrometer structures; ♦ Artificial neural networks to test analogue, mixed-signal ICs and microsystems. ANN are optimized also using DSP pre-processing; ♦ Some RF and microwave IC designs were carried out.

**Modeling and simulation:** ♦ 2 (3)D modeling and simulation of processes, structures and devices using mainly TCAD. Extensively used for electrical and thermal properties of smart power devices (including UIS, ESD); ♦ Models definition (SPICE like), parameters extraction (based also on measurement); **E-learning** <http://ec.elf.stuba.sk/moodle/course/>; Animated highly interactive courses on semiconductor materials, devices and circuits developed. English version under preparation. **Contact: Prof. Daniel Donoval, email: [daniel.donoval@stuba.sk](mailto:daniel.donoval@stuba.sk)**

Competence/Resources

**Gas microsensors based on surface modified semiconducting NiO thin films** development of technology for gas microsensors based on surface modified semiconducting NiO films.

The sensor chips (3x3 mm<sup>2</sup> sized) are mounted as suspended devices onto standard TO-8 packages. The Pt-modified NiO sensors show high responses and sensitivities to very low concentration (500 ÷ 5000 ppm) of hydrogen in air.

We are able to produce gas sensor structures and in collaboration with suitable small enterprise also readout electronic circuit including application software.

In present we are developing a new generation of monolithic integrated gas sensing sophisticated micro-electro-thermo-mechanical systems on GaAs on a chip.

