



SUCCESS STORY

A group of young researchers of the Valahia University of Targoviste stood out among exhibitors International Fair of Research, Innovation and Inventics PRO INVENT, Cluj-Napoca in March 2013, obtaining Grand Prix, the highest distinction of the event. The expectations were exceeded, our researchers also winning in recognition the Romanian Inventors Forum silver medal.

The invention appreciated by the judges with highest distinction at PRO INVENT Fair is called **Magneto-piezo actuator for micromanipulation** and consists of a manipulation system for fragile objects ranging between 10 and 50 micrometers, a scale finer than the diameter of a human hair itself. The potential applications are in the field of micro-technologies and advanced biomedical applications.

The principle is based on a hybrid drive, a combination of the electro-magnetic and piezoelectric forming a microgripper with two arms, each of two degrees of freedom. The in-plane microgripper actuation (tightening direction) is generated in a magnetic field, the movement being governed by compliant joints. The second degree of freedom is based on the piezoelectric effect, yielding the second bending movement in a vertical, transverse direction with respect to the former, magnetically-determined, direction of movement. The advantage of the proposed design consists in its simplicity (small number of components, integrated structure, reliability), micrometric precision positioning, working area, possibility to be fitted with displacement sensors for closed-loop control of the microgripper opening.

The innovation leads the technical capacity of the system to very precisely align the microgripper end effectors in the xOy plan (the system offsetting the static and gravity effects and also the manufacturing tolerances).

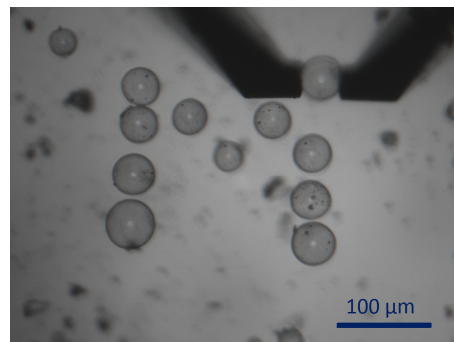
The demonstrator was conducted under the National Research and Development Project Young teams called "Advanced devices for micro and nanoscale manipulation and characterization (ADMAN)", run by Ioan Alexandru Ivan, associate professor at the Faculty of Electrical Engineering, Electronics and IT - Valahia University of Targoviste. The application team consisted of university lecturer PhD. Mihai

Ardeleanu and teaching assistant PhD. Veronica Despa, both affiliated to the Faculty of Mechanical and Materials Engineering. Some remarkable involvement is also acknowledged to the master students Valentin Gurgu and Giorgian Ionita from the Faculty of Electrical Engineering, Electronics and IT, who took a great deal of work related to the implementation of the demonstrator.

The success is due to the recent years sustained collaboration of Ioan Alexandru Ivan with the R&D Institute Femto-ST in Besançon, France. Over the time, the University has signed numerous cooperation agreements with French



universities and institutes, which issued in the development of several partnership doctoral theses of high scientific level. Other collaborations were related in parallel with the National Institute for Research and Development in Mechatronics and Measurement Technique (INCDMTM) in Bucharest, Professor Gheorghe Gheorghe.



The researchers from Valahia University will soon benefit from a new European-funded research institute, the Institute of Scientific and Technological Research Multidisciplinary Valahia University of Targoviste (ICSTM-UVT). The building is on the last stages of finishing and equipping with high performance laboratory equipment co-funded through a large European Regional Development Fund project.