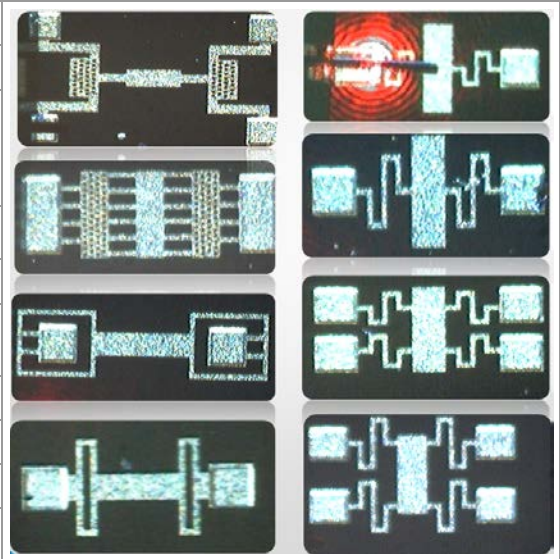


MICRO - NANO SYSTEMS LABORATORY

Contact details

Name	Micro – Nano Systems Laboratory
Acronym	MiNaS
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Areas of expertise

**Micro & Nano -systems
Micro & Nano -mechanics
Micro & Nano -tribology
MEMS & NEMS, Microstructures and materials
Adhesion, Friction, Fatigue, Reliability Design and Optimization**

Team

Prof. Dr. Eng. Marius Pustan, Prof. Dr. Eng. Corina Birleanu, Prof. Dr. Eng. Cristian Dudescu, Dr. Eng. Violeta Merie, Math. Florina Maria Rusu, Eng. Radu Chiorean

Representative projects

multiDOF, “Advanced Design of micromembranes with multiple degrees of freedom for optical MEMS applications”, PN-II-RU-TE-2014-4, (2015-2017)

ROBOGRIP, “Microgrippers as end-effectors with integrated sensors for microrobotics applications” MANUNET ERA-NET 2015 (2016-2018)

NARDEMS, “Nano mechanical and Nano tribological characterizations for reliability design of MEMS resonators”, PNII-RU-TE-2011, (2011-2014)

3SMVIB, “3 Scale modeling for robust-design of vibrating micro sensors”, FP7, (2012-2015)

REDEMS, “Reliability design of RF-MEMS switches for space applications, The Research, Development and Innovation Space Technology and Advanced Research”, Romanian Space Agency (STAR), (2012-2015)

MEMSMAT, “Tribomechanical Characterization of MEMS Materials for Space Applications under harsh environments”, Romanian Space Agency (STAR), (2013 – 2016)

MAC, “Advanced microsystems based on the micro-console made with MEMS techniques”, PN-II-72-2012/2008, (2008-2011)

Significant results

The most representative publications of the past 5 years:

1. Pustan M., Dudescu C., Birleanu C. "The effect of sensing area position on the mechanical response of mass-detecting cantilever sensor", *Microsystems Technologies*, 21 (9), 1827-1834, 2015.
2. Pustan M., Dudescu C., Birleanu C. "Nanomechanical and nanotribological characterization of a MEMS micromembrane supported by two folded hinges", *Analog Integrated Circuits and Signal Processing*, 82 (3), 627-635, 2015.
3. Voicu R., Pustan M., Birleanu C., Baracu A., Muller R. "Mechanical and tribological properties of thin films under changes of temperature conditions", *Surface and Coatings Technology*, 271, 48-56, 2015.
4. Rusu F., Pustan M., Birleanu C., Muller R., Voicu R., Baracu A. "Analysis of the surface effects on adhesion in MEMS structures", *J. Applied Surface Science*, 358 Part B, 634-640, 2015.
5. Merie V., Pustan M., Negrea G., Birleanu C. "Research on titanium nitride thin films deposited by reactive magnetron sputtering for MEMS applications", *J. Applied Surface Science*, 358 Part B, 525-532, 2015.
6. Birleanu C., Pustan M. "Analysis of the adhesion effect in RF-MEMS switches using atomic force microscope", *Analog Integrated Circuits and Signal Processing*, 82 (3), 571-581, 2015.
7. M. Pustan, C. Birleanu, C. Dudescu, J.-C. Golinval, "Dynamical behavior of smart MEMS in industrial applications", *Book - Smart sensors and MEMS for industrial applications*, chap. 12, 2013.
8. M. Pustan, C. Dudescu, C. Birleanu, Z. Rymuza "Nanomechanical studies and material characterization of metal/polymer bilayer cantilevers MEMS Structures", *International Journal of Materials Research*, 104 (4), 408-414, 2013.
9. M. Pustan, C. Birleanu, C. Dudescu, "Simulation and experimental analysis of thermo-mechanical behavior of microresonators under dynamic loading", *Microsystem Technologies*, 19 (6), 2013.

Significant solutions:

1. Development of a new method to estimate the stiffness of micro and nano -flexible structure by using atomic force microscope
2. Experimental determination of the energy dissipation in oscillating structure in order to increase the lifetime of vibrating sensors
3. Design-Fabrication-Testing of reliable mass-detection sensors
4. Design-Fabrication-Testing of micromembranes with high flexibility
5. Software development for lifetime estimation of vibrating MEMS structures
6. Advance nano-investigations of dental materials

Products and technologies:

1. Micromembrane from optical and RF applications
2. Paddle MEMS cantilevers for mass detection
3. Electrostatically actuated resonator
4. MEMS Software Development

The offer addressed to the economic environment

Research & development	<ul style="list-style-type: none"> - Micro and Nano - Systems - Micro and Nano - Tribology - Micro and Nano - Mechanics <p>Team members have great knowledge in: reliability design of micro and Nano systems, Nano /micro / macro tribological characterizations, experimental mechanics, material testing and numerical simulations. Due to a close collaboration with the productive sector, the research team is capable of collaboration with various industrial partners and research institutes. Already this laboratory is involved in collaborations with industrial partners, universities and research institutes from Romania, Belgium, Poland, Italy and France.</p>
Consulting	Consulting in any of the above mentioned fields can be done.
Training	The members of the team have a vast experience in the educational field (academics). Also, the team has experience in the development of the professional formation and reorientation trainings for engineers in the field of micro and Nano system design, advance testing at Micro & Nano devices.