

## Allegato A PROGETTO Scienza senza Frontiere – Brasile

### Name of the doctoral program

Meccanica

Full degree  Cotutelle

### Title of the research activity

Design and reliability of MEMS and vibration harvesters

### Short description of the research activity

The "Design and reliability of microsystems and MEMS" group develops a research activity focused on the study, desing and characterization of microsystems and micro sensors. Special attention is given to the development of new technologies for the project and the characterization of MEMS microsystems.

The research activity has been theoretically approached both with analytical and numerical methods and through the experimental methods and laboratory tests. Particular attention is dedicated to applied research, industrial collaborations and cooperative projects with other universities.

Main research topics and methods:

- Analysis of finite elements models of microsensors and microactuators for the simulation of the static and dynamic behaviour in presence of electrostatic coupling and geometrical nonlinearities.
- Experimental validation of the dynamic and vibratory behaviour of MEMS (Micro Electro-Mechanical Systems) electrostatically actuated through experimental measures with optical, laser and interferometrical systems

PhD thesis are available in the following subjects:

- Experimental validation of the electrostatic behaviour of **MEMS microsensors**. Microsystem reliability analysis, design and realization of structures for testing new MEMS device.
- Study and design of **Vibration Energy Harvesting** micro and meso scaled. Energy harvesters for power supply of wireless autonomous microsensors in vehcile and industrial system monitoring.

### Scientific responsible (name, surname, role)

Aurelio Somà , Professor

Email: [aurelio.soma@polito.it](mailto:aurelio.soma@polito.it)

### Number of vacancies for XXVIII cycle (begin January 2013)

3 (three)

### Specific requirements (experiences, skills)

Dynamics, Multibody , MEMS, Finite element models, use of experimental devices, Matlab.

### Website of the research group (if any)

[http://www.dimec.polito.it/en/research/research\\_groups/design\\_and\\_reliability\\_of\\_microsystems\\_and\\_mems](http://www.dimec.polito.it/en/research/research_groups/design_and_reliability_of_microsystems_and_mems)