

# Scholarships Bank

<http://scholarshipsbank.com>

---

## PhD Studentships in Multiscale Models for Arrays of Microsystems, FEMTO-ST, France

<http://scholarshipsbank.com/phd-studentships-in-multiscale-models-for-arrays-of-microsystems-femto-st-france/>

Phd: Multiscale Models for Arrays of Microsystems

Research Area: [Applied Mathematics](#), [Mechanics](#), Scientific Computation

Required Background: Partial Differential Equations, Continuum Mechanics, Numerical Methods, Programming skill

Grant: Supported by the Region Council of Franche-Comté, [FRANCE](#)

Expected work: At FEMTO-ST, we are developing both new mathematical tools and a [software](#) dedicated to this new field of Arrays of Microsystems described hereafter. During the thesis, we aim at deriving general multi-scale multi-physical models able to cover large classes of these systems. The multi-scale mathematical methods will be rooted in recently developed techniques, as homogenization in strongly heterogeneous media for dynamical problems, our new wave two-scale convergence and two-scale convergence in periodic [electrical](#) networks. Part of mathematical modeling will be done in collaboration with the Laboratory of [Mathematics](#) at Besançon.

Arrays of Microsystems: Micro-fabrication techniques yield a large variety of devices used as sensors, as actuators or even as complete systems including sensors/actuators/control processing. In an increasing number of applications, there is an interest in designing networks of micro-systems (in a same chip) instead of single ones. They are made of a repetition of a same unit or of a parameterized unit.

We cite a number of micro-system arrays, some of them being fabricated in our institute: Cantilever Arrays (like for Atomic Force Microscope Arrays, with a large range of applications in nanosciences and nanotechnologies), Micro-mirror arrays, or Micro-lens arrays (used for beamers, adaptive telescopes, lithography masks, as well as for numerous optic filters for optic fibers or laser arrays), Coupled Resonator arrays, Acoustic Probes based on micro-fabricated transducers (operating thanks to a capacitive, or a piezoelectric or a magneto-strictive effect), Surface or Body Acoustic Waves devices (converting acoustic waves into electric signal and reciprocally, used in particular for phone cells), Photonic crystals or Phononic structures (for emission, transmission, amplification, detection, and modulation of wave light or acoustic waves), and Micro-membrane arrays (for pressure regulation or for sonography and other acoustic applications).

Contact and Technical Staff

Michel LENCZNER

FEMTO-ST, Frequency-Time Department

32, rue de l'Observatoire

25044 Besançon Cedex – FRANCE

email: [michel.lenczner\[at\]jutbm.fr](mailto:michel.lenczner@jutbm.fr)

Tél : 03 81 83 26 69 / 03 81 85 39 89

For more information please visit our website: <http://scholarshipsbank.com/phd-studentships-in-multiscale-models-for-arrays-of-microsystems-femto-st-france/>

Last updated: 18 June 2009