



PhD in INGEGNERIA STRUTTURALE, SISMICA, GEOTECNICA / STRUCTURAL SEISMIC AND GEOTECHNICAL ENGINEERING - 39th cycle

THEMATIC Research Field: INNOVATIVE NUMERICAL SIMULATION OF MEMS

Monthly net income of PhDscholarship (max 36 months)
€ 1400.0
In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	<p>Micro- and Nano- Electro Mechanical Systems (MEMS, NEMS) studying, designing, testing and numerical modelling is quite demanding, since MEMS and NEMS are highly sophisticated devices, where electronics is coupled with mechanical parts, to create micro- and nano-sensors, micro- and nano-actuators, as well as micro-fluidic devices. MEMS are commonly used in automotive, aerospace and consumer-oriented engineering and are the key ingredient for the Internet of Things and Industry 4.0. Other fields are now taking advantage of these devices, like structural engineering, where MEMS start being used for monitoring and self-actuation and biomedical engineering. Strictly related to the field of MEMS are issues linked to micromechanics of materials and structures.</p> <p>www.mems.polimi.it</p>
Methods and techniques that will be developed and used to carry out the research	<p>MEMS-oriented research needs a highly multi-disciplinary approach and a deep knowledge of the fundamentals of physics, mechanics and electronics, as well as a certain familiarity with today's sophisticated techniques for numerical modelling and simulations.</p>
Educational objectives	<p>Since the proposed research project is highly multi-disciplinary, the candidate will have the opportunity to collaborate with a number of laboratories and research groups either in the Department of Civil and</p>



	groups either in the Department of Civil and Environmental Engineering or in other Departments of the Politecnico di Milano, in industries and in international research centers. He/she will acquire specialized knowledge on MEMS and their related research fields, like micromechanics and microfabrication.
Job opportunities	Direct employment in MEMS- and NEMS-research centers and industries in Europe and all-over the world. Job opportunities in other fields, where experts in multi-physics problems, micro-mechanics, testing and computational methods, advanced structural monitoring are requested.
Composition of the research group	3 Full Professors 3 Associated Professors 2 Assistant Professors 4 PhD Students
Name of the research directors	Frangi Attilio

Contacts

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 www.dica.polimi.it
 www.mems.polimi.it

Additional support - Financial aid per PhD student per year (gross amount)

Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad

Amount monthly	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Educational activities (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): The Ph.D. course supports the educational activities of its Ph.D. students with an additional funding equal to 10% of the scholarship, starting from the first year.

Teaching assistantship (availability of funding in recognition of support to teaching activities by



the PhD student): Ph.D. students are encouraged to apply, upon prior authorization, to the calls to support teaching activities at the undergraduate and Master levels at Politecnico, being paid for that. The teaching assistantship will be limited up to about 80 hours, maximum half of them devoted to teaching and classroom activities and the rest to support classworks and exams.

Computer availability and desk availability: Each Ph.D. student has his/her own computer for individual use. Each Ph.D. student has his/her own desk, cabinet and locker.