



PhD in FISICA / PHYSICS - 39th cycle

PNRR 118 PNRR Research Field: SPIN-BASED ENERGY EFFICIENT COMPUTING DEVICES

Monthly net income of PhDscholarship (max 36 months)
€ 1195.5
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	The usage of spin for computing and signal processing is still at its infancy. This PhD program deals with the investigation of low-power wave computing and neuromorphic computing strategies based on spin-waves and spin-orbital-charge interconversion. The research will focus on the investigation of physical phenomena and device architectures to be employed for energy-efficient information and signal processing.
Methods and techniques that will be developed and used to carry out the research	The adopted methodology is based on: <ul style="list-style-type: none"> - Micromagnetic simulations; - Thin films and multilayer growth/investigation; - Micro-nano fabrication; - Device characterization Experimental activities will be mainly carried out in Polifab (www.polifab.polimi.it).
Educational objectives	Development of interdisciplinary knowledge at the boundary between physics, microfabrication technology, computer science and electronics.
Job opportunities	This activity will be carried out in a group involved in the Joint Research Center of STM and Politecnico di Milano (STEAM), in strong connection with the world of MEMS development and production. This PhD will represent a solid basis for careers both in academia and in semiconductor industry.
Composition of the research group	1 Full Professors 3 Associated Professors 1 Assistant Professors 5 PhD Students



Name of the research directors	Riccardo Bertacco
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Contacts
<p>Prof. Riccardo Bertacco: riccardo.bertacco@polimi.it tel. 0039 02 2399 9663; https://www.fisi.polimi.it/en/people/bertacco http://nabis.fisi.polimi.it In collaboration with the staff of Polifab : www.polifab.polimi.it</p>

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	597.75 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	NA
By number of months at the company	0
Institution or company where the candidate will spend the period abroad (name and brief description)	- Dr. Philipp Pirro, Rheinland-Pfälzische Technische Universität, Kaiserslautern-Landau, Germany - Prof. Pietro Gambardella, ERTH Zurich
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>Educational activities: Educational activities (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences). Financial aid per PhD student per 3 years: max 4.872,90 euros per student.</p> <p>Teaching assistantship: There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations. The research will focus on the investigation of physical phenomena and device architectures to be employed for information and signal processing.</p> <p>Computer and Desk availability: individual use.</p>



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