



PhD in FISICA / PHYSICS - 39th cycle

THEMATIC Research Field: PHASE-NANOENGINEERED NANOSTRUCTURES FOR NANO-ELECTRONICS AND SPINTRONICS

Monthly net income of PhDscholarship (max 36 months)

€ 1250.0

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

Nanostructures are nanometric features obtained from thin film materials via nanofabrication processes, which possess markedly different properties from the bulk materials from which they are derived. The goal of this project is to combine conventional growth and nanofabrication methods such as optical and e-beam lithography, with thermal scanning probe lithography and direct laser writing, for obtaining novel electronic and magnetic properties in nanoelectronic and spintronic devices. The research activity is part of the H2020-ERC-2020-Stg: "Beyond Nanofabrication via nanoscale phase engineering of matter (B3YOND - GA 948225)"

Methods and techniques that will be developed and used to carry out the research

Growth of thin film multilayer structures via magnetron sputtering. Nanoscale surface characterization of the morphology, electric and magnetic properties via Scanning Probe Microscopy. Conventional Nanofabrication techniques, e.g. optical lithography, e-beam lithography, ion milling. Advanced Nanofabrication via thermal scanning probe lithography. Magnetic characterization via Kerr microscopy, vibrating sample magnetometer and synchrotron-based techniques. Electronic transport measurements: Magnetoconductance, Hall measurements. Cryogenic transport measurements in cryostat. Numerical methods: Micromagnetic simulations and Finite Elements Method simulation of electronic and thermal transport.

Educational objectives

Understanding of electronic transport and magnetism in



	nanostructured materials. Training in cleanroom techniques, nanoscale measurements, transport measurements and micro-nanofabrication methods. Participation and presentation in local and international workshops and conferences. Writing of scientific articles and proposals.
Job opportunities	Post-doc opportunities in academia both in Italy and abroad. R&D positions in companies, universities and research centers in Italy and abroad. Managerial positions in the field of innovation and technology.
Composition of the research group	0 Full Professors 1 Associated Professors 2 Assistant Professors 4 PhD Students
Name of the research directors	Edoardo Albisetti, Daniela Petti

Contacts

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PhyND group. <https://phynd.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	625.0 €
By number of months	6

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

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 5.096 euros per student.

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.



Computer and desk availability: individual use