



PhD in FISICA / PHYSICS - 39th cycle

THEMATIC Research Field: NANO MATERIALS FOR THE NEW GENERATION HUMAN MACHINE INTERFACE.

Monthly net income of PhDscholarship (max 36 months)

€ 1300.0

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

Evolution in human-machine interface requires the use of bio-compatible, bio-mimetics and functional materials, with high performance also in terms of durability and robustness, and the understanding of complex interface mechanisms taking place between the abiotic and biotic realms. The proposed activity concerns the characterization of nano-materials (nanoparticles, molecular aggregates, fibrillis) that can be used to develop interfaces; the study of interface model systems; the realization of hybrid systems. The project has broad implications in the world of robotics and life science. In particular, they could lead to revolutionary applications in fields such as prostheses (see the retinal prosthesis developed by our laboratory <https://www.novavido.it/it/>), the treatment of paralyzed patients or patients who have undergone amputations and soft robotics.

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

Spectroscopy: steady state absorption and emission; time resolved photoluminescence and pump-probe. Spettro-electro-chemistry. 3D bio printing, other deposition techniques for fabricating hybrid samples. Electrophysiology on cell-lines.

Educational objectives

The topic is highly interdisciplinary. The main outcome is a trans-disciplinary language and the understanding of multi-scales problems, while keeping a photophysics solid base.

Job opportunities

Academic; Research institutes; Bio Tech R&D; Bio



	photonics companies
Composition of the research group	1 Full Professors 0 Associated Professors 7 Assistant Professors 8 PhD Students
Name of the research directors	Guglielmo Lanzani

Contacts
guglielmo.lanzani@polimi.it; silvia.matti@iit.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	650.0 €
By number of months	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 5.300,25 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.</p> <p>Computer and Desk availability: individual use.</p>