



PhD in FISICA / PHYSICS - 39th cycle

PARTENARIATO PNRR Research Field: INNOVATIVE DIAGNOSTIC APPROACHES BASED ON TIME DOMAIN DIFFUSE OPTICS FOR CHRONIC HEART AND LUNG DISEASES (ANTHEM)

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

Time-domain diffuse optics offers unique opportunities for the non-invasive probing of deep tissues, providing the estimate of tissue composition and microstructure-related parameters, potentially useful for *in vivo* diagnostics and monitoring. The PhD project is part of the national project ANTHEM (AdvaNced Technologies for Human-centrEd Medicine – **CUP B53C22006720001** – Project code: **PNC0000003**) and aims at the development, performance assessment, and test *in vivo* of a portable instrument for the monitoring/diagnosis of cardiovascular and/or lung diseases by means of broadband time domain diffuse optical spectroscopy.

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

The PhD candidate will be involved in all steps needed for the development, validation, and real use of innovative photonics instrumentation for next-generation biomedical diagnostics. He/she will familiarize with pulsed laser sources, time domain detectors, time-correlated single photon counting, models and data analysis derived from the radiative transport equation, international protocols for performance assessment, design of *in vivo* measurement protocols.

Educational objectives

The main educational objectives are:
1) to consolidate the student's background in physics of matter and photonics;
2) to develop experimental know-how on photonics devices and biomedical optics;



	3) achieve soft skills, in particular in the communication of experimental research activities.
Job opportunities	The candidate will be exposed both to the rapidly growing field of health technologies and to the innovative world of photonics with strong multidisciplinary attitude, favoring job opportunities in high-tech industries and medical centers. Furthermore, he/she will gain experience for a potential future career in the academia or in research centers.
Composition of the research group	4 Full Professors 5 Associated Professors 3 Assistant Professors 10 PhD Students
Name of the research directors	Paola Taroni

Contacts
paola.taroni@polimi.it https://www.fisi.polimi.it/en/research/research_structures/research_lines/50400

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

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): financial aid per PhD student per 3 years: max 4.872,90 euros per student. Teaching assistantship: Various forms of financial aid for teaching support activities are available. The PhD student is encouraged to take part in those activities within the limits allowed by the regulations. Computer and desk availability:



Computer availability: individual use*Desk availability:* shared use.