



PhD in FISICA / PHYSICS - 41st cycle

THEMATIC Research Field: BROADBAND TWO-DIMENSIONAL ELECTRONIC SPECTROSCOPY

Monthly net income of PhDscholarship (max 36 months)

1350.0

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	Two-dimensional electronic spectroscopy (2DES) is a powerful ultrafast spectroscopy technique providing the maximum amount of information on the third-order nonlinear optical response of a system, simultaneously maximizing temporal and spectral resolution. The goal of this PhD thesis is the development of a broadband 2DES setup in partially collinear pump-probe configuration. The system will be driven by a high repetition rate (100 kHz) Yb laser and will include the capability of phase cycling. The system will then be applied to the study of the non-equilibrium response of molecules and nanostructures.
Methods and techniques that will be developed and used to carry out the research	The PhD candidate will perform the following activities: 1) Development of a broadband non-collinear optical parametric amplifier (NOPA) working at 100 KHz; 2) Development of a 2DES setup pumped by the NOPA and using the TWINS birefringent interferometer; 3) Company (if possible – this text should be agreed with the funding company) and where the research work will be developed.
Educational objectives	The scholar will receive a multidisciplinary training in topics including nonlinear optics, ultrafast optical spectroscopy, nonlinear microscopy, and the ultrafast physics of biomolecules and condensed matter systems. He/she will have the opportunity to visit partner laboratories in Italy and abroad.
Job opportunities	Due to the multidisciplinary training in cutting edge



	techniques of optics and photonics as well as solid-state physics and nanoscience, the scholar will have excellent job opportunities in high-tech industries. In addition, he/she will be well positioned for an academic career.
Composition of the research group	2 Full Professors 3 Associated Professors 2 Assistant Professors 5 PhD Students
Name of the research directors	Prof. Giulio Cerullo; Prof. Dario Polli

Contacts	
giulio.cerullo@polimi.it; dario.polli@polimi.it.	

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad	
Amount monthly	675.0 €
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). Financial aid per PhD student per 3 years: max 5300,25.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: computer: individual use; desk: shared use	