



## PhD in FISICA / PHYSICS - 38th cycle

**THEMATIC Research Field: MATERIALS AND DEVICES FOR NEAR AND MID-INFRARED PHOTONICS**

**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**

The detection of near and mid-infrared radiation is extremely relevant in material recognition, sensing and imaging. Most of the devices available nowadays for industrial, biomedical and scientific applications are based on compound semiconductors, however, such material systems suffer from a less mature technology, as compared to Si, which complicates the integration with the read-out circuit and increases production costs. Solutions compatible with Si-based technology are, therefore, highly desirable. The availability of Si-compatible materials enabling the fabrication of near and mid-infrared detectors, waveguides and modulators would therefore greatly increase the number of applications profiting from infrared devices. The objective of the research refers to the project PRIN 2020 ¿RETINA n. 2020P8WE5S¿ funded by MUR.

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

The research will focus on the spectroscopic characterization of semiconducting thin films and nanostructures by means of Fourier-transformed infrared spectroscopy (FTIR), photoluminescence (PL) and photocurrent (PC) measurements.

**Educational objectives**

Knowledge of the infrared optical properties of semiconducting thin films and nanostructures, experimental determination of optical constants in the infrared region, numerical modelling of light propagation/absorption in semiconductor microstructures.



<b>Job opportunities</b>	R & D in semiconductor industries and academic institutions.
<b>Composition of the research group</b>	0 Full Professors 2 Associated Professors 1 Assistant Professors 2 PhD Students
<b>Name of the research directors</b>	Jacopo Frigerio; Paolo Biagioni; Giovanni Isella

<b>Contacts</b>	
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<b>Additional support - Financial aid per PhD student per year (gross amount)</b>	
<b>Housing - Foreign Students</b>	--
<b>Housing - Out-of-town residents (more than 80Km out of Milano)</b>	--

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	625.0 €
<b>By number of months</b>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>	
<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 5.095,96 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 availability: individual use Desk availability: individual use</p>	