



PhD in INGEGNERIA DEI MATERIALI / MATERIALS ENGINEERING - 40th cycle

**THEMATIC Research Field: SYNTHESIS AND ADVANCED CHARACTERIZATION OF
COLLOIDAL NANOSTRUCTURES**

Monthly net income of PhDscholarship (max 36 months)

€ 1500.0

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**

In this PhD program we aim to synthesize and characterize colloidal nanocrystals made of multiple components, of which one is a metal halide. These materials are expected to have appealing applications in light emitting devices photocatalysis and light detection, which will also be targeted, depending on material development and specific properties. This project will be carried out a collaboration between Politecnico di Milano and the Italian Institute of Technology in Genova. This project is financed by ERC project "NEHA - Nanoscale Epitaxial Heterostructures Involving Metal Halides", funded by the Research Council Executive Agency within the ERC-2022-ADG program, Grant Agreement GA 101095974.

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

Advanced colloidal chemistry syntheses will be used to prepare the samples, based on hot injections approaches using air-free techniques. Extensive characterization will be performed using optical, structural, microscopic and spectroscopic techniques. Device fabrication and characterization tools will be linked to the specific material developed and related properties.

Educational objectives

Advanced colloidal chemistry syntheses will be used to prepare the samples, based on hot injections approaches using air-free techniques. Extensive characterization will be performed using optical, structural, microscopic and



	spectroscopic techniques. Device fabrication and characterization tools will be linked to the specific material developed and related properties.
Job opportunities	Research in academic and industrial environment
Composition of the research group	1 Full Professors 1 Associated Professors 14 Assistant Professors 10 PhD Students
Name of the research directors	Liberato Manna / Chiara Bertarelli

Contacts	
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https://nach.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)	1st year	2nd year	3rd year
	1000.0 € per student	1000.0 € per student	1000.0 € per student
max number of financial aid available: 2, given in order of merit (only for students with scholarship)..			

Scholarship Increase for a period abroad	
Amount monthly	750.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>Confidentiality: since this is a thematic scholarship, the management of Confidential Information, Results, and their publication should be subordinated to the restrictions agreed upon with the funding company. Upon acceptance of the scholarship, the beneficiary must sign a specific commitment.</p> <p>Individual budget for research (max 6.114,50 euros per student): 1st year: about 2.000 euro per student; 2nd year: about 2.000 euro per student; 3rd year: about 2.000 euro per student</p> <p>Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial of for activities of support to the teaching</p>



practice. The PhD student is encouraged to take part in these activities within the limits allowed by the regulation.

Computer and desk availability: individual or shared use computer and desk