

PhD in INGEGNERIA DEI MATERIALI / MATERIALS ENGINEERING - 41st cycle

THEMATIC Research Field: SMART POLYMERIC MATERIALS FOR ADVANCED AND SUSTAINABLE MANUFACTURING

Monthly net income of PhDscholarship (max 36 months)

1400.0

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 main focus of the research project is on smart polymeric materials for advanced and sustainable manufacturing. The primary objective of this work is to design, develop and characterize novel polymeric systems, also biobased, to be used as smart, reversible, safe-and-sustainable-by-design polymers for use in the field of advanced and circular manufacturing. Such new polymeric systems will enable the extension of the service life of parts and components in a variety of sectors, including fiber-reinforced composites, structural and non- structural adhesives, industrial protective coatings. This research aims to open up new opportunities within the circular economy of polymeric materials for advanced applications, by prolonging their life-time, improving their end-of-life management and increasing their sustainability.
Methods and techniques that will be developed and used to carry out the research	Design and development of reversible polymeric systems, also resorting to biobased monomers, oligomers and precursors; design and development of suitable experimental and theoretical approaches to assess the reversibility of such polymers; chemical-physical, morphological, structural and functional characterization of the developed polymeric materials; functional characterization of such reversible polymers as matrix materials for fiber-reinforced composites, structural and non-structural adhesives, and coating systems. The

POLITECNICO DI MILANO



	non-structural adhesives, and coating systems. The research project is carried out within the framework of two Horizon EU funded projects, in which the research group is actively engaged: "RECREATE – Recycling technologies for circular reuse and remanufacturing of fiber-reinforced composite materials" (Grant agreement ID: 101058756) and "ECORES WIND – Novel circular resin development for composite structures in wind energy applications" (Grant agreement ID: 101148066). The PhD student will be expected to take part in the activities foreseen in both projects and to actively interact with all the projects partners, according to specific experimentation needs.
Educational objectives	The PhD student will acquire new knowledge and skills in materials development, characterization, structure- property- relationships, with a major focus on reversible polymers. The development of soft skills (e.g., team working, public speaking, project management) will also be fostered.
Job opportunities	Job opportunities Potential professional career pathways may be envisaged in the fields of: development, processing and recycling of polymeric and composite materials for various market sectors; industrial research and development; strategic consultancy.
Composition of the research group	2 Full Professors 3 Associated Professors 6 Assistant Professors 4 PhD Students
Name of the research directors	Proff Stefano Turri and Gianmarco Griffini

Contacts		
Telephone: +39 02 2399 3252 / 3213 Email: stefano.turri@polimi.it / gianmarco.griffini@polimi.it		
Web-pages of the research group: https://www.cmic.polimi.it/ricerca/elenco-gruppi-di- ricerca/chiplab/		

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

POLITECNICO DI MILANO



Housing - Out-of-town residents	
---------------------------------	--

Scholarship Increase for a period abroad		
Amount monthly	700.0 €	
By number of months	6	

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Educational activities (funding for participation in courses, summer schools, workshops and conferences) - financial aid per PhD student per year:

1st year: around 1.900 euros per student

2nd year: around 1.900 euros per student

3rd year: around 1.900 euros per student

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