POLITECNICO DI MILANO

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

THEMATIC Research Field: FOOD WASTE PROCESSING FOR BIOBASED COMPOSITES

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 proposed PhD project aims to develop a new class of sustainable materials through an innovative supply chain to produce bio-composites. These materials are obtained by recovering food waste and are combined with low-environmental-impact process technologies to realize complex structures for different applications, including closed loop agritech applications.
Methods and techniques that will be developed and used to carry out the research	The proposed PhD project is **experimental** in nature and will be conducted within the framework of the **"From Trash to Treasure" (FT2T) Research Project**, financed by the Lombardy Region. The selected candidate will be trained in the main techniques for **material extraction from food waste** and the preparation of **bio-composites** utilizing both traditional and advanced processing technologies. This comprehensive training will equip the student with critical skills in the field of **sustainable materials development.** The student's responsibilities will specifically include the **physico-chemical, structural, and functional characterization** of the developed materials and any resulting prototypes. This detailed analysis is crucial for validating the innovative materials platform, which aims to achieve high percentages of bio-based content and valorized organic by-products, as stipulated by the FT2T project objectives.
Educational objectives	1. Learn the principles of design and characterization of

	biobased composites 2. Implement closed and open loop circular economy strategies on materials design
Job opportunities	The PhD unlocks high-demand roles. Graduates typically become R&D Scientists/Managers in industries prioritizing sustainable materials (e.g., design, packaging), specializing in new formulation and process optimization. Other paths include Circular Economy Consultants providing strategic advice, or joining Academia/Research Centers and Start-ups focused on green technology innovation. This profile is key to driving the ecological transition in manufacturing and engineering firms.
Composition of the research group	4 Full Professors 4 Associated Professors 2 Assistant Professors 6 PhD Students
Name of the research directors	Proff. Luigi De Nardo, Andrea Fiorati

Contacts
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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	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Confidentiality: since this is a thematic scholarship, the management of Confidential Information, Results and their publication is subordinate to the restrictions agreed upon with the funding company. Upon acceptance of the scholarship, the beneficiary may sign a specific commitment. **Educational activities** (funding for participation in courses, summer schools, workshops and conferences) - financial aid per year:

1st year: around 1.900 euros
2nd year: around 1.900 euros
3rd year: around 1.900 euros

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.