

PhD in Materials Science and Technology

Research Title: Polymer nanocomposites based on chemically functionalized graphene-related materials

Funded by	Politecnico di Torino
-----------	-----------------------

Supervisor	Alberto Fina (alberto.fina@polito.it)
------------	---

Contact	Polito, DISAT department http://www.disat.polito.it/
---------	--

Context of the research activity	<p>Significant research attention is currently focused on the chemical processing and functional applications of graphene-related materials to create nanocomposites. Target applications will be, for example, in the areas of electronics, low temperature heat exchangers, EMI shielding, gas barrier, drug release etc.</p> <p>Therefore, the development of techniques to disperse graphene-related materials into different thermoplastic polymers is of utmost interest</p>
----------------------------------	--

Objectives	<p>This PhD program addresses fundamental and applied research for the exploitation of graphene-related materials into nanocomposites. In particular, thermal and electrical conductivities are targeted. This PhD programme is closely related to ongoing activities in the supervisor's research group in the field of chemical functionalization of graphene-related materials</p> <p>The main research objectives of this PhD thesis includes:</p> <ul style="list-style-type: none">• Selection, research and development of functionalized graphene-related materials, aimed at obtaining optimal dispersions in polymers and engineering of thermal contact within the percolation network made of graphene related materials.• Research, development and design of dispersing methods for graphene-related materials into polymers. Different dispersion strategies are envisaged, including mixing in solution blending, melt blending, polymerization during melt blending.• Characterization of thermal, electrical, mechanical and functional properties of the prepared nanocomposites
------------	---

Skills and competencies for the development of the activity	<p>Candidates should have a strong chemistry background and high motivation to learn through advanced research.</p> <p>Expertise in chemical synthesis and/or polymer synthesis, polymer characterization and/or nanocomposite preparation is required.</p> <p>Practical attitude for the lab activities and problem solving skills are also appreciated</p>
--	--