MATERIALS SCIENCE AND TECHNOLOGY

AMMIN - Functional surfaces and device fabrication via laser material processing

Funded By	Politecnico di TORINO [P.iva/CF:00518460019]
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Context of the research activity	The work of the thesis will focus on the study of laser material processing techniques for the realization of functional surfaces (e.g. superhydrophobic/philic, nanostructured) and devices (e.g. sensors, photonic chips).
Objectives	Laser processing of materials is a fast growing topic in industrial processes driven by the industry requirements. An active field is the laser processing of materials by ultra-short pulses (having durations ranging from nano-seconds to picoseconds and femtoseconds). This technique allows for ultra-precise machining of all types of materials: i.e. polymers, metals and ceramics. Moreover, adjusting the power and the pulse characteristics, it is possible to go beyond the mere possibility of milling and drilling. Indeed, by laser processing of surface one can create micro- and nano-texture. These characteristics make the subject a wide field of experimentation with industrial application as a focus in the field of functional surfaces and device fabrication. The candidate should be very motivated, able to work autonomously and in a team. We look for a candidate interested in all the aspects of the research, from the more fundamental ones like laser-matter interaction to the more applied like the potential industrial and scientific applications.
Skills and competencies for the development of the activity	A strong background in materials scinece/engineering is required. Good data analysis skills, experience on thermal aspects of propagation in materials and former participation in industrial projects is preferred. Knowledge of a programming language like Python, Matlab, C++ and Labview is an added value.