Prof. Fabrizio Giorgis

Fabrizio Giorgis is Associate Professor in Experimental Physics of Matter at the Applied Science and Technology Department (DISAT) of Polytechnic University of Torino, where he gives lectures on Applied Physics, Optics and Photonics and Nanotechnological Processes. DISAT Delegate for Applied Research and Technological Transfer.
Senior researcher at the Materials and Microsystems Laboratory (Chi-lab@PoliTo), with the role of coordinator of the Optical Spectroscopy Division. His research activity deals with: i) growth and characterization of silicon- and carbon-based materials, ii) fabrication and characterization of optical microcavities, photonic crystals and plasmonic nanostructures, iii) microfluidics and Micro Electro-Mechanical Systems (MEMS), iv) technological processes and optical characterizations dealing with semiconductors and biological assays. Most of his current research is devoted to optical spectroscopy (fluorescence, FTIR, Raman/SERS) and photonic sensing devoted to the analysis of proteins, peptides and microRNA in the frame of nanomedicine focused on early cancer diagnostics.
F. Giorgis is author and co-author of more than 200 scientific papers published on peer-reviewed international journals or presented to International Conferences and inventor of three patents on advanced sensors; referee of the most important journals concerning Physics of Condensed Matter and Physical Chemistry. He is involved as coordinator in national and international projects with academic institution, research centers and industries.

Abstract: Raman spectroscopy during the last decades is gaining more and more attention in analytical applications and can provide chemical fingerprints of cells, tissues and biofluids. In contrast to established analytical techniques, this vibrational spectroscopy provides label-free, non-destructive, chemically selective and spatially resolved analysis. Actually, the high chemical specificity merged with the ability to use advanced optical technologies in the visible or near-infrared spectral range have recently led to an increase in diagnostic applications of Raman spectroscopy. Several experimental setups can be optimized, from confocal microscopes for acquisition of three-dimensional spectral information up to optofluidic devices for direct use in clinical diagnostics. This presentation will provide the applications of the various Raman spectroscopy based techniques in the broad area of Nanomedicine, including veterinary applications, ranging from the use of nanomaterials, biosensing and therapeutics