University of Pavia

Ph.D. School of Electrical and Electronics Engineering and Computer Science

SEMINAR

Terahertz Time Domain Spectroscopy

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Aula Seminari ex Dipartimento di Elettronica, floor D

During the last two decades, the generation of broadband terahertz (THz) pulses has become a particularly active research area, owing to potential applications in various fields, including Biology, Physics, Chemistry, and Material Science.
In fact, THz waves, with a frequency ranging from 0.1 to 10 THz, (i) can penetrate and image inside plastics, semiconductor wafers, fabrics, and most dielectric materials that may be opaque to visible light, (ii) have low photon energies that do not cause harmful photoionization in biological tissue, and (iii) exhibit strong dispersion, as well as absorption for numerous molecules.
In this talk, I will introduce the most common techniques for generating and detecting broadband THz pulses and I will show some applications in imaging and spectroscopy. Furthermore, I will present some recent results on THz nonlinear spectroscopy and on the characterization of metallic nanoantennas resonating at these frequencies.

Luca Razzari received both his M.Sc (2001) and Ph.D (2004) degrees in Electronic Engineering from the University of Pavia. From 2005 to 2006, he was a postdoctoral researcher in the Optical Spectroscopy Group (Institute for Complex Systems, C.N.R.) in Rome. From 2006 to 2010, he was first a postdoctoral researcher (Marie Curie fellow) and then a research associate in the Ultrafast Optical Processing Group at INRS-EMT, Quebec, Canada. In October 2010, he joined the Nanostructures Group at the Italian Institute of Technology. His current research interests include terahertz linear and nonlinear spectroscopy, integration of nonlinear optical functions for optical signal processing, and THz nanoplasmonics.

Organizer	**Ph.D. Coordinator**
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