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BIO

Andrea received the master's degree in Physics in 1999 at the University of Firenze with a nonlinear optic and electron spectroscopy thesis, and then he perfected his knowledge in atomic physics at European LENS laboratory. He completed his Ph.D. in Physics in 2004 applying the optical Brillouin spectroscopy to the investigation of the generalized dynamic of the soft matter at the University of L'Aquila where he largely contributed to the development of the highest performances Raman-Brillouin spectrometer for visible and UV radiation existing at that moment.

From 2004 to 2009, he had post-doc and research fellowship positions at the Universities of L'Aquila, Roma La Sapienza, and Roma 3, becoming expert in Brillouin scattering, inelastic x-ray scattering, photon-correlation, and Raman spectroscopies, focusing to the role of order and disorder, and how the structural relaxations influence the dynamics and macroscopic properties of materials. He developed advanced skills in applied optics and automation designing and engineering new spectroscopy instrumentation. In 2010, he gained a research position at INRiM in Torino where he co-developed two successful optical interferometers with 10 pm resolution.

In 2011, Andrea joined the nanostructure department of IIT in Genova investigating the physics of heterostructures, carbon-based materials, and plasmonic devices. At that time he developed a novel hot-electron plasmonic assisted Scanning Probe Microscope for the study of solid-state and biologically inspired systems at the nanoscale.

Since 2014, Andrea has a senior Research Scientist position at KAUST University (Saudi Arabia) where he collaborated to the realization of an advanced bio-physic lab. Here, aside from large area nanostructured SERS plasmonic substrates, he has developed multi spectroscopy SPM instruments to probe simultaneously chemical, structural and charge transport properties at the nanoscale. Extreme local field enhancement and confinement provided by surface plasmon polaritons compression at the apex of a nanostructured metal tip make possible the synergic phenomena: the generation of an hot plasmonic carriers source and an intense hot spot at nanoscale size. With the technique have been investigated, among others, graphene, heterostructures of MoS_2/SnO, AlGaN quantum wells, mXenes devices, novel polymers for organic electrochemical transistors, numerous 2D and 3D organic-inorganic metal halide perovskites, and several samples of biological origin.