Hayk Harutyunyan
Distinguished Postdoc

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Ph.D., Applied Physics, University of Pisa

Research Summary:

During my PhD studies I have mainly worked on the excited state dynamics of individual carbon nanotubes. Combining confocal microscopy with time-resolved photoluminescence measurements we were able to simultaneously characterize spectral and dynamical properties of carbon nanotubes' emission on the single "molecule" level. As a postdoc at the Institute of Optics, University of Rochester my research focused on nonlinear optical properties of materials at reduced dimensions. Most recently, we have developed the concept of nonlinear optical antennas and have worked on the design principles of such devices.

Selected Recent Publications:

H. Harutyunyan, G. Volpe, R. Quidant, L. Novotny, "Enhancing the nonlinear optical response using multifrequency resonant gold-nanowire antennas", *Phys. Rev. Lett*. 108, 217403 (2012).

H. Harutyunyan, G. Volpe, L. Novotny, "Nonlinear optical antennas", book chapter in *"Optical Antennas"*, M. Agio & A. Alù (Eds), Cambridge University Press, (2012) ISBN:9781107014145.

H. Harutyunyan, S. Palomba, J. Renger, R. Quidant, L. Novotny, "Nonlinear dark-field microscopy", *Nano Lett*. 10, 5076, (2010).
Highlighted in Nature Nanotechnology 6, 5 (2011) and Nature Photonics 5, 69, (2011).

H. Harutyunyan, T. Gokus, A. A. Green, M. C. Hersam, M. Allegrini, A. Hartschuh, "Defect induced photoluminescence from dark excitonic states in individual single-walled carbon nanotubes", *Nano Lett.*, 9, 2010 (2009).