Computational nanoplasmonics: Success and challenges

Department of Physics & Astronomy, The University of Texas at San Antonio, TX 78249, USA. Although Plasmonics has emerged as a research field less than 20 years ago, a lot has been achieved from the experimental side but also from the theoretical point of view. Plasmonic nanoparticles and nanostructures of any size and any shape can now be synthesized or fabricated routinely and physical effects such as Surface-Enhanced Raman Scattering (SERS), Cathodoluminescence (CL), Electron Energy-Loss Spectroscopy (EELS), Second Harmonic Generation (SHG), plasmon-enhanced chemistry, or plasmonic heating can now be observed and used experimentally to design and guide the realization of future and novel nanotechnologies. Yet, computational plasmonics that complements, strengthens, and drives the experimental research faces its own challenges and also possess its own success stories. Here I will bring in perspective some of the most recent successful aspects of computational plasmonics in optical and electron spectroscopies (SERS, CL, EELS), photonic applications (optical nanoswitch), physics of hybrid systems (plasmon-exciton and plasmon-vibration interactions). I also will highlight several major challenges that remain and actively drive the plasmonic community to develop novel numerical tools and models.

Biography
Nicolas Large obtained a dual Ph.D. in 2011 in Nanophysics from the University of Toulouse, France and in Advanced Materials from the University of the Basque Country in San Sebastián, Spain, where he was co-supervised by Profs J. Aizpurua and A. Mlayah. He later worked as a postdoctoral researcher with Prof. P. Nordlander at Rice University in Houston (2012-2014), and in with Prof. G.C. Schatz at Northwestern University in Chicago area (2014-2016). He is currently an Assistant Professor of Physics at the University of Texas at San Antonio and has published over 30 papers in high impact journals.

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