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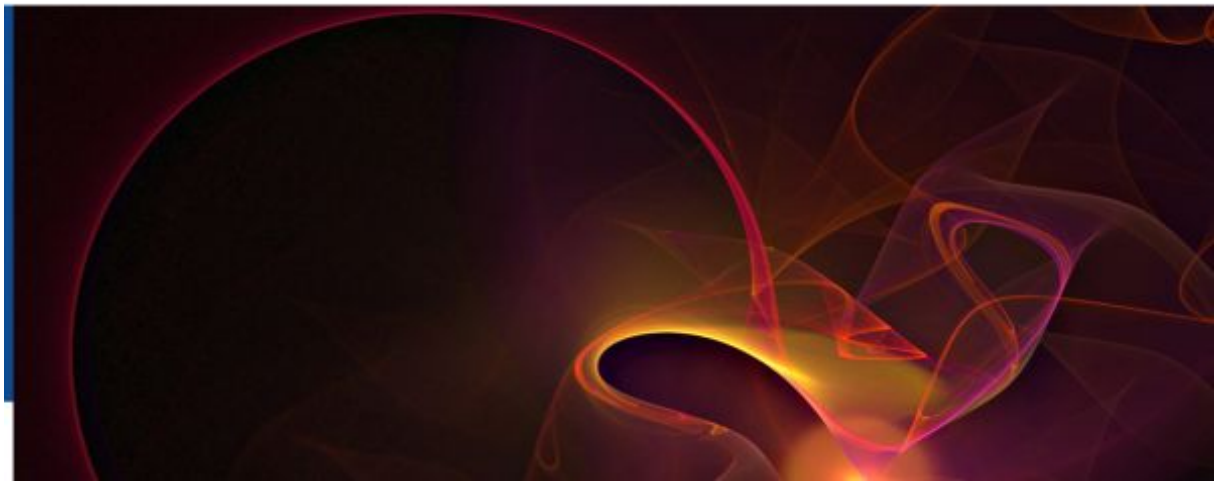
graphene nanostructures

IVÁN SILVEIRO FLORES

Advisor: F. Javier García de Abajo



PhD Thesis Defense IVAN SILVEIRO 'Plasmonic Response of Graphene Nanostructures'

IVAN SILVEIRO

May 25, 2016

Wednesday, May 25, 11:30. Facultad de Optica y Optometria, Universidad de Santiago de Compostela

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Nanophotonics Theory

ICFO-The Institute of Photonic Sciences

Doped graphene has attracted an enormous interest due to its extraordinary optoelectronic properties useful for nanophotonics. Specifically, its bidimensional nature and singular atomic structure are translated into an unconventional linear dispersion relation. Thus, when nanostructures of graphene are illuminated, the excited plasmons (collective oscillations of conduction electrons) possess salient features like high tunability and degree of

confinement, enhancement of the electromagnetic fields, strong nonlocalities and nonlinearities...

In this thesis, we realize an in-depth study of the plasmonic response of doped graphene under different novel conditions. We focus on the theoretical concepts that could be useful for the present a general electrostatic scaling law in order find the graphene plasmon frequencies, we study the effects of inhomogeneous distributions of doping, we account for the substantial quantum-nonlocal and nonlinear effects over graphene plasmons, and finally, we present a new molecular sensing technique including graphene.

Wednesday, May 25, 11:30. Facultad de Optica y Optometria, Universidad de Santiago de Compostela

Thesis Director: Prof. Dr. Javier Garcia de Abajo