# Plasmonic Metastructures and DNA-Assemblies for Optics and Photochemistry: the Origin of Chirality, the 2D World, and Hot Electrons

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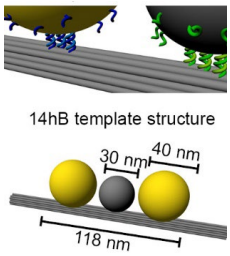
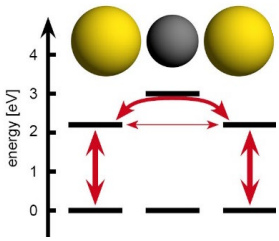
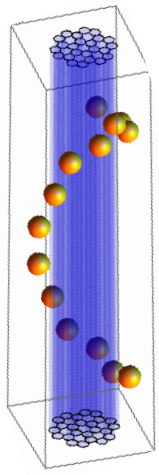
## Abstract

Plasmonic nanostructures and metamaterials are very efficient at the absorption and scattering of light. The studies to be presented in this talk concern special designs of hybrid nanostructures with electromagnetic hot spots, where the electromagnetic field becomes strongly enhanced and spatially concentrated. Overall, plasmonic nanostructures with hot spots demonstrate strongly amplified optical and energy-related effects, and this talk will review some of such phenomena. (1) Using nanoparticle arrays made of different metals, one can transfer plasmonic signals coherently and with minimal losses [1]. (2) Plasmonic hot spots efficiently generate energetic electrons, which can be used for photochemistry and photodetection [2,3,4]. (3) Nanostructures with small interparticle gaps can strongly enhance heat's optical generation and confine high photo-temperatures in small volumes [5,6,7]. (4) Colloidal nanocrystal assemblies and metastructures with plasmon resonances allow us to strongly enhance the chiral optical responses (circular dichroism) of biomolecules and to induce chiral photo-chemical effects [8,9,10,11].



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