

Abstract Submitted  
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**Quantum Plasmonics: Electron transfer processes** PETER NORDLANDER, Rice University — Plasmon energies can be tuned across the spectrum by simply changing the geometrical shape of a nanostructure. Plasmons can efficiently capture incident light and focus it to nanometer sized hotspots which can enhance electronic and vibrational excitations in nearby structures.[1] Another important but still relatively unexplored property of plasmons, is that they can be efficient sources of hot energetic electrons which can transfer into nearby structures and induce a variety of processes. This process is a quantum mechanical effect: the decay of plasmon quanta into electron-hole pairs. I will discuss how plasmon induced hot electrons can be used in various applications: such as to induce chemical reactions in molecules physisorbed on a nanoparticle surface;[2] to inject electrons directly into the conduction band of a nearby substrate;[3] and to induce local doping of a nearby graphene sheet.[4] References [1] N.J. Halas *et al.*, Adv. Mat. 24(2012)4842 [2] R. Huschka *et al.*, JACS 133(2011)12247; S. Mukherjee *et al.* TBP 2012 [3] M. W. Knight *et al.*, Science 332(2011)702, Z.Y. Fang *et al.*, NL 12(2012)3808 [4] Z.Y. Fang *et al.*, ACS Nano 6(2012)10.1021/nn304028b

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