Abstract Submitted
for the TSF10 Meeting of
The American Physical Society

Er^{3+}:Y_2O_3 Fluorescence Enhancement through Energy Transfer to Plasmonic Nanoparticles NATHAN RAY, University of Texas San Antonio — Rare earth (RE) and noble metal (NM) hetero-nanostructures hold promise for many unique and robust applications. The overlap of the Er^{3+} $^4H_{5/2}$ fluorescence manifold with the extinction spectra of the Au surface plasmons can give rise to energy transfer between Er^{3+} (donor) and plasmonic Au (acceptor). In the limit of high efficiency energy transfer, the intensity of emission from the Er^{3+}/Au hetero-nanostructure becomes significantly more intense than the emission of Er^{3+} alone. The quantum efficiency of the combined system, in the limit of high energy transfer, is dependent on only the scattering quantum efficiency of the Au nanoparticles. Additionally, this enhancement is a function of the quantity of gold attached. Here, we report and discuss the synthesis and spectroscopic properties of colloidal hetero-nanostructures based on a radiating plasmon model of surface plasmon coupled emission. This research was supported by the National Science Foundation PREM Grant No. DMR-0934218.

Nathan Ray
University of Texas San Antonio

Date submitted: 23 Sep 2010 Electronic form version 1.4