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**Plasmon and Exciton Coupling and Purcell Enhancement** QUINTON RICE, MARIA VERONICA RIGO, Hampton University, RAFAL FUDALA, University of North Texas, HYOYEONG CHO, WAN-JOONG KIM, Electronics and Telecommunications Research Institute, RYAN RICH, University of North Texas, BAGHER TABIBI, Hampton University, ZYGMUNT GRYCZYNSKI, IGNACY GRYCZYNSKI, University of North Texas, WILLIAM YU, Louisiana State University, JAETAE SEO, Hampton University — The photoluminescence from plasmon-coupled exciton is of great interest for optoelectronic applications, because of the large quantum yield with localized field enhancement and reduced nonradiative transition. The Coulomb interaction through plasmon-exciton coupling results in the Purcell enhancement of quantum dots (QDs) in the vicinity of metal nanoparticles (MNPs). With plasmon-exciton coupling, the radiative and non-radiative decay rates and the coupling rates compete with each other. The coupling rate is closely related to the coupling distance between QDs and MNPs. The optimized coupling distance scales the re-excitation density of localized fields and the plasmon-exciton coupling rates. If the plasmon-exciton coupling rate is much faster than the radiative and non-radiative transitions of excitons, the re-excitations of excitons by the localized plasmonic field and the reduction of non-radiative transitions may occur. This presentation includes plasmon-exciton coupling dynamics, large enhancement and temporal properties of PL, and dipole-PL polarization fidelity of hybrid optical materials of plasmonic nanometals and excitonic semiconductor QDs. The work at Hampton University was supported by the National Science Foundation (NSF HRD-1137747), and Army Research Office (ARO W911NF-11-1-0177). The work at University of North Texas was supported by National Institutes of Health (NIH R01EB12003, and 5R21CA14897 (Z.G.)).

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