Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Controlled Deposition of Nanocrystal Quantum Dots on Silicon Surfaces OLIVER SEITZ[1], HUE M. NGUYEN[2], DAMIEN AUREAU[3], AMANDEEP SRA[4], ANTON V. MALKO[5], YVES J. CHABAL[6], University of Texas at Dallas — Studying Forster resonant energy transfer (FRET) has constantly been a challenge because of the poor control in transferring nanocrystal quantum dots (NQDs) onto various substrates. This lack of control often resulted in formation of aggregates (3D growth), inhomogeneity, and poor adhesion. In this study, using self assembled monolayers (SAMs), dense monolayer of NQDs have been attached onto silicon substrate, with and without the presence of oxide interlayer, allowing investigating FRET effects via photoluminescence measurements. Such SAMs, directly attached to the silicon, via Si-C bonds, display an interface quality with low interface states. Moreover, the ability to be prepared with tunable thicknesses renders them ideal for FRET investigation. Such hybrid colloidal NQD/Silicon optoelectronic structures could potentially be attractive for both photovoltaic as well as light emitting applications.

[1]Department of Materials Science and Engineering
[2]Department of Physics
[3]Department of Materials Science and Engineering
[4]Department of Materials Science and Engineering
[5]Department of Physics
[6]Department of Materials Science and Engineering

Yves J. Chabal
Department of Materials Science and Engineering

Date submitted: 27 Nov 2010 Electronic form version 1.4