

## Study of Electrophoretic Deposition of ZnO Nanoparticles onto Silicon Substrates and Testing Performance of ZnO/p-Si

The electrophoretic deposition of zinc oxide (ZnO) nanoscale thin films is important to a number of research areas including biosensors, photophilic dye-sensitized solar cells, optoelectronic devices, and thin film transistors. In this talk, we will discuss our use of ZnO nanoparticle-based thin films, synthesized and grown at room temperature and deposited via electrophoretic deposition (EPD), on p-doped silicon substrates. Our experimentation plan includes using scanning electron microscopy to assess surface morphology as well as current-voltage characterization of ZnO/p-Si heterojunctions to study device performance potential. We will discuss our results in reference to our hypothesis that the concentration of ZnO nanoparticles in the electrolytic solution is a primary factor in the attainment of enhanced flatness of ZnO thin films necessary for device development. This work represents a potential opportunity for the integration of this method of deposition into applications where ZnO contributes to the reliability, affordability, and increased sensitivity needed for the next generation of nanoscale devices and systems.