

Photovoltaic technology is a very important component of renewable energy source. Solar cells with concentrators are higher efficiency, lower cost photovoltaic devices. My work is a part of an integrated collaborative project focused on the micro-solar cell array with optical concentrating system. There are materials issue, optical design, soft lithography, and system integration involved. A silica nanoparticle reinforced polymer matrix as the material with optics that fit to the micro solar cell design have shown advantage in cell performance. Currently I am working on a non-tracking solar energy light trapping scheme based on photonic crystal structure and nanoparticles that is compatible with the microsolar cell design.