

### **Research Description**

The photovoltaic effect is the direct conversion of incident light into electricity by a pn or p-i-n semiconductor junction device. Photons with energies greater than the energy bandgap of the semiconductor are absorbed, promoting electrons from the VB to CB, leaving a corresponding number of holes in the VB. If the electron-hole pairs are generated within the depletion region, the electrical field in depletion region separates them. Max power can be delivered to the load when its impedance matches that of illuminated device. Most PV products are in large-scale power generation, which is expensive due to large amount of Si used. We are trying to fabricate micro solar cells under concentrators using our transfer technique. The concentrators can concentrate sunlight on each ribbon, so very low density of semiconductor is needed in our design. Moreover we can make 3D multi-junction solar cells by transfer another kind of semiconductor with higher energy band-gap on top of the lower band-gap semiconductor to absorb more light. My work is focused on the fabrication of such microstructured semiconductor and application to the large-area devices.