

Low-cost CdTe nanowire preparation for improved solar cells. (Mentor: Erik Menke) One of the major research focuses for materials science in the last ten years has been to lower the cost of photovoltaic cells while maintaining a reasonably high efficiency. Nanomaterials have the potential to address this goal by lowering cost (by using less material, for instance) of solar cells, as well as increasing their overall efficiency through size-dependent physical phenomena. For instance, metallic nanowires and nanoparticles have been shown to increase light absorption in solar cells due to plasmonic effects, coaxial nanowires have been shown to have increased photon conversion efficiencies over thin-film solar cells due to the minimization of recombination events, and evenly spaced semiconductor nanowires have been shown to increase light absorption over thin-film solar cells by increasing light trapping in the material. REU students will contribute to this growing body of research by utilizing the lithographically patterned electrochemical deposition process to prepare CdTe nanowires and measuring how the synthesis parameters (electrodeposition solution composition, deposition time and temperature, applied potential, etc.) affect the quality of the nanowires and their light absorption efficiency.