

The Future of Photovoltaics

Next Generation Materials and Devices in Engineering Physics at McMaster University

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Solar cells are an increasing component of the energy infrastructure of the developed world, and offer an excellent off-the-grid energy source for the developing world. A mature photovoltaics industry, supported by concerned consumer demand and government feed-in-tarrifs is centered around Silicon solar cells, comprising 85%+ of the total market. Silicon cells are for many reasons not an ideal choice, so much research is concerned with displacing them from their current market domination. This talk will provide a short introduction into the limitations of current commercial solar cell technologies and detail several of the research projects in this field ongoing in Engineering Physics, with emphasis on the presenter's own work. First, several potential alternative photovoltaic materials will be discussed, as to the state of the art and the challenges remaining. Second, potential solar cell designs which aim to utilize new physical processes in the capture of energy will be discussed as to their feasibility and future progress.