Solar cells go thin and flimsy

Mr Deceglie with the dye-sensitized test cells.

The next generation of solar cells made out of plastics and microscopic crystals instead of silicon are taking shape at UQ (University of Queensland). UQ Master of Physics student Michael Deceglie is working on improving the stability and overall efficiency of solar cells.

Mr Deceglie is testing two new ways of making solar cells out of dye-sensitized solar cell and a combined nanocrystal polymer solar cell.

The dye-sensitized cells use dye molecules to inject electrons into a thin titanium dioxide film while the polymer cell is a thin film of plastic mixed with microscopic crystals that channel the charge through the cell.

Mr Deceglie said both methods could produce solar cells that had similar efficiencies to current silicon technology but were cheaper more flexible, easier to produce and more environmentally friendly.

“Since electrons don't move well in the polymers, we incorporate nanocrystals with the polymer to provide a pathway along which electrons can move to generate electrical current,” Mr Deceglie said.

“The dye-sensitzed device works in a manner similar to phosynthesis in plants.”

Mr Decegile joined UQ's Soft Condensed Matter Physics Group in July as one of 14 Americans granted a Fulbright postgraduate award scholarship.

He will study under Group leader Dr Paul Meredith on the scholarship worth about $30,000 including his study and travel allowance.

“I chose to work with Paul's group because they were doing work that I found very interesting and Paul was very enthusiastic about having me,” the 22-year-old from Taringa said.

“By travelling to Australia on this Fulbright, I am hoping to highlight the importance of transnational cooperation to meeting our energy needs in a sustainable way.”

Fellow UQ physics PhD students Paul Schwenn and David Blake are also helping with the solar cell project.

Source: University of Queensland