

NSF REU Site Sensors Research Team Submits Two Papers

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Caption: Sensors fellow Marie Cosgrove-Davies smiles as she applies voltage across a holographic polymer-dispersed liquid crystal sample and examines its response on a computer monitor.

Before she came to Drexel University for the NSF-sponsored REU Site Sensors: From Design to Implementation in Summer 2006, Marie Cosgrove-Davies was not sure if she wanted to invest the time and effort necessary to obtain a graduate degree. After just a few weeks into the summer program, Marie was conducting research that has led to two papers being submitted for publication in peer-reviewed journals. The experience swayed Marie's decision to eventually pursue a research-focused graduate degree.

Marie had just completed her sophomore year at Swarthmore College when she was accepted into the Sensors program. Under the guidance of Dr. Adam Fontecchio, Assistant Professor of Electrical and Computer Engineering (ECE), and ECE Ph.D. student Anna Fox, Marie researched light transmission through stacked holographic polymer-dispersed liquid crystals (H-PDLCs). H-PDLCs are electrically switchable thin films that can be used as filters, lenses, or other optical elements. Marie specifically examined the effect that stacking several of the films together had on the quality of light transmission through the stack of films. This research could potentially lead to electrically switchable filters and lenses that would be especially useful in spectrometers and in satellite image filtering.

The research that Marie performed, along with Dr. Fontecchio and his graduate student, Anna, has been detailed in two papers submitted for publication in two different peer-reviewed scientific journals. One paper has been submitted to *Applied Optics* and is

currently under review. Another paper is scheduled to be submitted in Summer 2007 to *Applied Physics Letters*. Marie collected a significant amount of the data that is presented in both papers and appears as a co-author.

Marie did not have experience in her research topic before she came to Drexel, but was thrilled that faculty and graduate students were so eager to help her understand her topic. "I did a bit of reading on my topic before I came to Drexel, but my grounding in optics was only very basic," Marie says. "Happily, Dr. Fontecchio, Anna, and everyone else on the research team were very good at explaining to me how my topic worked and in helping me find papers that would further educate me on my topic," she adds.

Upon completion of the Sensors program, Marie developed a newfound interest in research at the graduate level. She has said the following about her experience with Sensors: "I really enjoyed my research and the experience of working with a research group. After I graduate from Swarthmore College, I plan to enter the Peace Corps for two years, then perhaps pursue a graduate degree. My experience with the Sensors program certainly swayed me towards graduate work."