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Contact

Melissa Weber, Director of Communications
Phone: 320-589-6414, weberm@morris.umn.edu

Jenna Ray, Editor/Writer
Phone: 320-589-6068, jrray@morris.umn.edu

Schmidt and Koehn solar cell research published in *Macromolecules*

Summary: Their research focuses on creating more efficient renewable energy technology.

(April 14, 2011)-The undergraduate solar cell research of Jennifer Schmidt and Ryan Koehn, under the direction of Associate Professors of Chemistry Ted Pappenfus and Joe Alia, has been published in the recent issue of *Macromolecules*. Their research, [“PBC-DFT Applied to Donor−Acceptor Copolymers in Organic Solar Cells: Comparisons between Theoretical Methods and Experimental Data.”](#) funded by the University of Minnesota Initiative for Renewable Energy and the Environment (IREE), seeks to better understand the electronic properties of organic materials used in solar cells—emerging technology for solar energy conversion.

The student’s solar cell research focuses on creating better and more efficient renewable energy technology. Solar cells are currently comprised of silicon, which is a relatively heavy material. The students are researching novel polymers that can be deposited as a film in a solar cell instead of silicon. Polymers would be less expensive to produce and are thinner. Schmidt and Koehn are specifically researching the distinctions in energy capturing capacities between different polymers, by using methods in theoretical chemistry, to get an idea of which polymers would be most effective for an ideal design.

Schmidt and Koehn’s research also indirectly contributes to help making this emerging technology become commercially viable. Their research methods can be used in designing materials with the appropriate physical properties. Once these materials come to market, it would not only be a lighter, more efficient way to capture energy, it would be a money saving technology. Schmidt says, “It is plausible to imagine entire roofs on top of houses covered in a thin solar cell made from polymers.”

In addition to looking for ways to change the world of renewable energy, the students also gain personal benefits from the Morris research. “I feel like the opportunities to do research here are a great stepping stone for research I’d like to do in the future at graduate school,” says Koehn.

Professor Alia sees the research opportunities as an impactful part of a Morris education. “Long term, people who are students now will be responsible for developing the technology of the future and for educating the next generation of scientists after them,” he reflects.

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