

# Michelle J. Price

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## EDUCATION

**University of Michigan**                      *Ann Arbor, MI*    *2008-Present*  
Ph.D. Candidate, Applied Physics Program  
Dual Master's Student, Electrical Engineering and Computer Science

**Gustavus Adolphus College**                      *St. Peter, MN*    *2004-2008*  
B.A. in Physics    *Graduated Summa Cum Laude*  
B.A. in Political Science    Thesis: *The Politics of Pharmaceutical Crops*

## AWARDS & HONORS

2010	Office of Science Graduate Research Fellowship	<i>U. S. Dept. of Energy</i>
2010	Declined Graduate Research Fellowship	<i>National Science Foundation</i>
2010	Declined National Defense Science & Engineering Fellowship	<i>U. S. Dept. of Defense</i>
2009	Graham Environmental Sustainability Institute Fellowship	<i>University of Michigan</i>
2008	Rackham Merit Fellowship	<i>University of Michigan</i>
2008	Regents' Fellowship	<i>University of Michigan</i>
2007	Phi Beta Kappa National Honor Society, Eta of Minnesota Chapter	
2007	Pi Sigma Alpha National Honor Society in Political Science	
2007	Sigma Pi Sigma National Honor Society in Physics	
2007	Swanson Endowed Scholarship in Physics	<i>Gustavus Adolphus College</i>

## RESEARCH & EXPERIENCE

**Graduate Research**                      *Applied Physics Program, University of Michigan*    *2008-Present*

*Research Advisor: Prof. Stephen Maldonado*

- ◆ Sensitized p-GaP electrodes with organic dyes to investigate charge injection under depletion conditions and modeled the system using a unique 1D finite-difference simulation adapted from a solid-state modeling program. Experimental and simulation results indicated large internal quantum yields as a result of the electric field induced by a depletion layer within the GaP, allowing for greater flexibility in substrate quality and dye regeneration.
- ◆ Characterized charge transfer mechanisms at heterojunctions between n-type Si and a low-cost organic semiconductor. Low collection velocity at these interfaces resulted in light-harvesting advantages over metallic heterojunctions.
- ◆ Investigated rate-limiting bulk recombination in GaP electrodes due to the weak absorption of GaP relative to typical minority carrier diffusion lengths. Subsequently showed an order of magnitude increase in collection efficiency using GaP electrodes modified with high-aspect ratio surface architectures that allowed for shorter lateral diffusion paths of minority carriers.
- ◆ Assembled a calibrated, LabVIEW-automated spectral response system to measure quantum efficiency for devices at UV, visible and near-IR wavelengths.

**Undergraduate REU Research**                      *UCLA Physics & Astronomy Department*    *2007*

*Research Advisor: Prof. Katsushi Arisaka*

- ◆ Developed Monte Carlo simulations to predict the determination capability of the size and mass of particulate dark matter for various trial durations and detectors
- ◆ Trained another student to run simulations to accelerate project and meet publication deadlines

**Wind Research** *Gustavus Adolphus College Physics Department* 2007-2008

*Research Advisor: Prof. Charles Niederriter*

- ◆ Identified the optimal model, location and hub height for wind turbines in St. Peter from wind climate profiles and detailed local topographical information using WASP software.

**Teaching Experience** *Gustavus Adolphus College Physics Department* 2007-2008

*Reported to: Prof. Paul Saulnier*

- ◆ Teaching assistant for electromagnetism, electronics and introductory physics labs
- ◆ Tutor for introductory physics courses

**Bank Teller** *Wells Fargo & Company, Multiple MN Branches* 2004-2006

- ◆ Achieved recognition for successfully developing and implementing new methods to consistently surpass sales incentive goals and boost customer satisfaction
- ◆ Demonstrated leadership among peers in assisting in new employee training and consistently displaying a strong work ethic and positive attitude to maintain high office morale during a period of extensive employee turnover
- ◆ Consistently chosen to pioneer customer-interactive sales roles and manage compliance projects

### *PROFESSIONAL DEVELOPMENT & OUTREACH*

- ◆ Participated in the 2011 Michigan Green Technology Entrepreneurship Academy, a concentrated weeklong retreat focused on commercializing promising technologies
- ◆ Mentor many graduate and undergraduate students by assisting with lab techniques, scientific theory, preparation for qualifying exams, editing of manuscripts and written applications and feedback on presentation format, content and delivery
- ◆ Developed an interactive lesson plan related to the source and uses of alternative energy, then taught a 7<sup>th</sup> grade science class. Seneca Middle School, Macomb, MI 2009
- ◆ Volunteered at summer camps and events run by Michigan Women in Science and Engineering (WISE) for middle school students in 2009 and 2010

### *PUBLICATIONS & PRESENTATIONS*

- ◆ M. J. Price and S. Maldonado, "Dye-Sensitized Charge Injection Under Depletion Conditions: Efficient Light-Stimulated Hole Injection into p-GaP," *In Preparation*.
- ◆ J. M. Foley,\* M. J. Price,\* J. I. Feldblyum and S. Maldonado, "Analysis of the Operation of Thin Nanowire Photoelectrodes for Solar Energy Conversion," *Energy and Environmental Science*, *Submitted*.
- ◆ M. J. Price and S. Maldonado, "Comparison of majority carrier transfer velocities at Si/polymer and Si/metal photovoltaic heterojunctions," *Applied Physics Letters* **97** 083503 (2010).
- ◆ M. J. Price and S. Maldonado, "Macroporous n-GaP in Nonaqueous Regenerative Photoelectrochemical Cells," *Journal of Physical Chemistry C* **113** 28 (2009).
- ◆ K. Arisaka et. al., "XAX: A multi-ton, multi-target detection system for dark matter, double beta decay and pp solar neutrinos," *Astroparticle Physics* **31** 2 (2008).
- ◆ M. J. Price, "The Politics of Pharmaceutical Crops," *Pi Sigma Alpha Undergraduate Journal of Politics* **8** 2 (2008).
- ◆ M. J. Price and S. Maldonado, "Dye-Sensitized Charge Injection Under Depletion Conditions: Efficient Light-Stimulated Hole Injection into p-GaP," poster presentation at the SPIE Optics + Photonics Conference in San Diego, CA 2011.
- ◆ M. J. Price, "Enhanced Collection of Photogenerated Carriers Across Semiconductor Interfaces through Heterojunction Design," poster presentation at the Gordon Research Conference on Electrochemistry in Ventura, CA 2010.