

## Audrey M. Bowen

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### EDUCATION:

*University of Illinois at Urbana-Champaign* 8/05-Present  
Ph.D. Candidate, Materials Chemistry  
Research Advisor: Prof. Ralph G. Nuzzo

*Cornell University* 8/01-5/05  
B.S., Materials Science & Engineering  
Research Advisor: Prof. George G. Malliaras

### RESEARCH EXPERIENCE:

*University of Illinois at Urbana-Champaign* 3/06-Present  
*Dept. of Chemistry, Urbana, IL*  
Graduate Research Assistant  
Advisor: Prof. Ralph G. Nuzzo

- Currently developing a toolbox of non-planar and 3-D patterning protocols that interface soft lithography and traditional photolithography
- Studying various aspects of rate-dependent delamination for more precise and quantitative understanding of the switching between adhesion and release of patterned metal films to and from an elastomeric stamp (for transfer printing applications)

*University of Illinois at Urbana-Champaign* 9/05-1/06  
*Dept. of Materials Science & Engineering, Urbana, IL*  
Graduate Research Assistant  
Advisor: Prof. Jianjun Cheng

- Synthesized and patterned (via capillary force lithography) a protein-resistant co-polymer for cell and protein patterning applications
- Responsible for building and maintaining new laboratory devoted to biological materials; maintained cell cultures; advised undergraduate student (non-viral gene delivery project)

*Intel Corporation* Summer 2005  
*Components Research, Hillsboro, OR*  
Graduate Technical Intern

- Copper Electropolish Chemistry: Characterized three-component electropolish solutions in order to identify the effect of each component on copper removal rate
- KLA Nanopics Atomic Force Profiler: Oversaw tool installation and calibration; provided training and technical support for engineers; demonstrated capability of new tool to reliably measure recess in small lines; performed tool matching with existing microfabrication tools in order to verify accuracy of measurements

*Cornell University* 5/03-5/05  
*Dept. of Materials Science & Engineering, Ithaca, NY*  
Undergraduate Research Assistant  
Advisor: Prof. George G. Malliaras

- Organic Photovoltaics: Studied various material and processing combinations in pursuit of solution-processed organic photovoltaic devices based on pentacene and fullerene derivatives
- Dye-Sensitized Metal Oxide/Polymer Photovoltaics: Investigated the problem of low power conversion efficiency in photovoltaic devices; optimized the interface of dye-sensitized titania and polypyrrole by utilizing the technique of in-situ vapor phase polymerization
- Senior Thesis (Completed 5/05): "Pentacene Derivatives for use in Small Molecule Based Photovoltaic Devices"

Intel Corporation  
Components Research, Hillsboro, OR  
Undergraduate Technical Intern

Summer 2004

- Investigated methods to improve insertion loss at the butt-coupled interface of a laser and optical waveguide
- Fabricated and tested optical waveguide fiber-to-chip coupling structures; met goal of obtaining less than 1dB loss over coupling distance less than 1mm; suggested more effective test structures for future experimentation

### TEACHING EXPERIENCE:

University of Illinois at Urbana-Champaign  
Dept. of Chemistry, Urbana, IL  
Dept. of Materials Science & Engineering, Urbana, IL  
Graduate Teaching Assistant

- CHEM 104: General Chemistry II, Dr. Christian Ray (1/07-5/07)
- CHEM 101: Introductory Chemistry, An-Phong Le (8/06-12/06)
- MATSE 450: Introduction to Polymer Science & Engineering, Prof. Paul Braun (1/06-5/06)
- MATSE 308: Materials Laboratory II, Prof. Jian Ku Shang (1/06-5/06)

Cornell University  
Dept. of Materials Science & Engineering, Ithaca, NY  
Undergraduate Teaching Assistant

- MS&E 312: Junior Laboratory, Prof. Christopher Ober (1/05-5/05)
- MS&E 111: Nanotechnology, Prof. Emmanuel Giannelis (8/03-12/03, 8/04-12/04)

### PUBLICATIONS:

A.M. Bowen, R.G. Nuzzo, "Fabrication of flexible binary amplitude masks for patterning on highly curved surfaces," *Adv. Func. Mater.*, *accepted*.

J.H. Han, A. Bowen, T.N. Andryushchenko, R.P. Chalupa, A.E. Miller, H.S. Simka, K.C. Cadien, S. Shankar, "Effects of viscosity-dependent diffusion in the analysis of rotating disk electrode data," *J. Appl. Electrochem.* 38, 1-5 (2008).

X. Feng, M.A. Meitl, A.M. Bowen, Y. Huang, R.G. Nuzzo, J.A. Rogers, "Competing Fracture in Kinetically Controlled Transfer Printing," *Langmuir* 23, 12555-12560 (2007).

M.T. Lloyd, A.C. Mayer, A.S. Tayi, A.M. Bowen, T.G. Kasen, D.J. Herman, D.A. Mourey, J.E. Anthony, G.G. Malliaras, "Photovoltaic cells from a soluble pentacene derivative," *Org. Electron.* 7, 243-248 (2006).

K. Cadien, M. Reshotko, B. Block, A. Bowen, D. Kencke, P. Davids, "Challenges for on-chip optical interconnects," *Proc. SPIE Int. Soc. Opt. Eng.* 5370, 133-143 (2005).

### PRESENTATIONS:

"Fabrication of flexible photomasks for patterning on non-planar surfaces," A.M. Bowen, R.G. Nuzzo; Materials Research Society Spring Meeting, April 2009, San Francisco, CA.

### SELECTED HONORS/MEMBERSHIPS:

Materials Research Society, Spring 2009 - present  
Cornell Engineering Alumni Association, Spring 2005-present  
Cornell Alumni Admissions Ambassador Network, Spring 2007- present  
Incomplete List of Teachers Ranked as Excellent by Their Students (UIUC) Fall 2006 & Spring 2007  
Donald W. Hamer Graduate Fellow (Dept of Materials Science & Engineering, UIUC), 2005-2006

ASM Twin Tier Chapter Scholarship (Ithaca, NY), Spring 2005  
Learning Initiatives for Future Engineers Undergraduate Research Grant (Cornell), Spring 2005  
Cornell Engineering Dean's List (each semester), Spring 2003 – Spring 2005  
Toyota Community Scholar (1 of 2 in Oregon, 1 of 100 in US; for leadership, academic  
excellence, and significant community service contributions), 2001-2005  
Robert C. Byrd Honors Scholar, U.S. Dept. of Education, 2001-2005