

# Matthew E. Stewart

Materials Research Laboratory  
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## Objective

A research position in a national or government lab.

## Education

**Ph.D., Chemistry** (Analytical) expected March 2008  
University of Illinois Urbana, IL

- Pursuing Doctorate
- Professor Ralph Nuzzo, Advisor
- GPA: 4.0

**B.S., Chemistry** (ACS-certified) 2002  
Wittenberg University Springfield, OH

- *Summa cum laude*, Departmental Honors, Dean's List, University Honors
- GPA: 4.0

## Expertise and Skills

### Instrumental Methods

- Microscopy: Optical, Fluorescence, Scanning Electron.
- Fabrication methods: Photolithography, Soft and Nanoimprint Lithography, Metal Deposition, Dry and Wet Etching.
- Surface analytical methods: AFM, STM, XPS, Ellipsometry, Profilometry, ATR-FTIR.
- Standard analytical methods: GCMS, AAS, TGA, IR, HPLC, UV-VIS, Liquid and Solid-State NMR.

### Computer Skills

- General: MS Office, Freehand, MathCad.
- Data analysis software: SigmaPlot, IgorPro, Peakfit, Matlab.
- Chemistry software: Titan, Spartan, HyperChem Lite
- Image analysis software: ImagePro, Adobe Photoshop, Nanoscope, Magnafire.

### Other

- Class 100 Clean Room Use.
- Dry Atmosphere Glove Box and Schlenk Line Use.
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## Work Experience

University of Illinois Urbana, IL  
**Research Assistant**, Professor Ralph Nuzzo 2004-present

- Investigated the use of quasi-3D plasmonic crystals for sensing biomolecular surface interactions.
- Used PDMS microfluidic devices and surface modification procedures to pattern surfaces with protein gradients using the depletion effect.
- Examined effects of component materials and adhesion proteins on neuron growth and development in microfluidic devices (collaboration with Dr. Martha Gillette).

**Teaching Assistant**, Dr. Angela Cannon 2003

- Taught 3 laboratory sections of general chemistry (30 students/section).

**Chemistry Learning Center Tutor**, Ani Agrawal Spring 2004

- Tutored all chemistry subjects for 10 hours a week during Spring semester.

**Teaching Assistant**, Dr. Alexander Scheeline

Fall 2004

- Taught 2 laboratory sections of Advanced Analytical Chemistry.
- Graded full lab reports and held office hours.

**Work Experience (continued)**

Givaudan

Cincinnati, OH

**Summer Position**, Bill Prinz

2003

- Worked in the Savory Division with other Flavor Development Chemists to create and improve flavors and yeast mixtures for food companies.
- Tested production lots against standards for quality control purposes.

University of Michigan

Ann Arbor, MI

**Research Assistant**, Professor Marc Johnson

2002

- Synthesized molybdenum alkylidyne complexes for triple bond metathesis.

**NSF-REU Research Assistant**, Assistant Professor Larry Beck

Summer 2001

- Performed solid-state synthesis of zeolites.
- Investigated loading of p-aminobenzoic acid in zeolite ZSM-5 by solid-state NMR.

Wittenberg University

Springfield, OH

**Student Research**, Professor Marc Ellison

2000-2002

- Studied methods of producing high-quality STM tips.
- Investigated the attachment of organic monolayers to silicon.
- Analyzed silicon surface modification by STS and ATR-IR spectroscopy.
- Examined the kinetics of laser induced oxidation of HOPG.

**Awards and Honors**

University of Illinois

- Jay and Ann Schenck Endowment Fund Fellowship in Chemistry 2006-2007
- Beck Fellowship in Chemistry 2005-2006
- Robert F. Carr Fellowship in Chemistry 2004-2005
- Roger Adams Fellowship in Chemistry 2003-2004
- Ranked as Excellent on the "Incomplete List of Teachers" Fall 2003

University of Michigan

- IGERT Fellowship in Chemistry 2002-2003

Wittenberg University

- Outstanding Senior Chemistry Award 2002
- Wittenberg University Scholars Scholarship 2002
- American Chemical Society Organic Chemistry Award 2001
- Ezra Keller Scholarship 2001
- Wittenberg Research Fellowship 2001
- James T. Gregory Award: Potential in Chemical Research 2001
- McGregor Fellowship Summer Research Grant 2000
- General Chemistry Award 1999

**Presentations**

University of Michigan

- Ohio-Michigan NSF-REU Research Poster Session 2001  
Wittenberg University
- Senior Seminar: REU Research 2002
- Wittenberg University Research Symposium 2001
- Central Ohio Undergraduate Research Symposium 2000
- Wittenberg University Student Research Session 2000

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**Publications**

Stewart, M.; Mack, N.; Malyarchuk, V.; Lee, T.W.; Gray, S.; Nuzzo, R.; & Rogers, J.;  
“Single and Multi-channel Biosensing Using 3D Plasmonic Crystals Fabricated by Soft UV  
Nanoimprint Lithography.” Submitted to *PNAS*.

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**References**

Available upon request