

## Julie S. Biteen

Assistant Professor of Chemistry  
Assistant Professor, by courtesy, of Biophysics

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### ACADEMIC TRAINING

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- Stanford University, Stanford, CA** 2007-November 2009  
Postdoctoral Scholar, *Specialty in superresolution imaging in live bacterial cells*  
Research Advisor: W. E. Moerner (Chemistry)
- California Institute of Technology, Pasadena, CA** 2006  
Ph.D. Chemistry; *Specialty in silicon nanocrystal optoelectronics and metal plasmonics*  
Research Advisors: Harry Atwater (Applied Physics) and Nathan Lewis (Chemistry)
- California Institute of Technology, Pasadena, CA** 2003  
M.S. Applied Physics, GPA 3.85
- Princeton University, Princeton, NJ** 2001  
A.B. Chemistry with Highest Honors, GPA 3.92

### PROFESSIONAL EXPERIENCE

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- Assistant Professor, University of Michigan** January 2010 –  
- Assistant Professor, Department of Chemistry  
- Affiliated Faculty, Biophysics  
- Affiliated Faculty, Applied Physics  
- Affiliated Faculty, Program in Chemical Biology  
- Member, Michigan Nanotechnology Institute for Medicine and Biological Sciences
- Postdoctoral Scholar, Stanford University** 2006 – 2009  
(Advisor: W. E. Moerner)  
*Single-molecule imaging of biophysical processes in cells*
- Graduate Researcher, California Institute of Technology** 2002 – 2006  
(Advisors: H. A. Atwater and N. S. Lewis)  
*Silicon nanocrystal optoelectronics and metal nanoparticle plasmonics*

## **HONORS, AWARDS AND FELLOWSHIPS**

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NIH Exploratory/Developmental Research Grant Award (R21)	2012-2014
Picoquant Young Investigator Award	2011
(Co-I) NSF Materials Research Science and Engineering Center (MRSEC)	2011-2017
(Co-I) NSF Major Research Instrumentation Program (MRI-R2)	2010-2013
Elizabeth Crosby Faculty Grant	2010
Burroughs Wellcome Fund Career Award at the Scientific Interface	2009-2013
University of Michigan Biological Sciences Scholar	2009
Materials Research Society Graduate Student Silver Medalist	2005
Society of Chemical Industry Perkin Medal Scholarship	2004
Laser Focus World Commendation for Excellence in Technical Communications	2004
PEO Scholar Award	2004
Dow Chemical Company Travel Stipend	2003

## **REFEREED JOURNAL PUBLICATIONS**

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### ***Independent Career at University of Michigan***

- M.-C. Cheng, A. T. Leske, T. Matsuoka, B. C. Kim, J.-S. Lee, M. A. Burns, S. Takayama and **JSB**, “Super-Resolution Imaging of PDMS Nanochannels by Single-Molecule Micelle-Assisted Blink Microscopy,” *submitted* (2012).
- Y. Liao, S.K. Yang, K. Koh, A.J. Matzger and **JSB**, “Heterogeneous Single-Molecule Diffusion in One-Two- and Three-Dimensional Microporous Coordination Polymers: Directional, Trapped and Immobile Guests,” *Nano Letters*, *in press* (2012). DOI: 10.1021/nl300971t
- JSB**, “Extending the tools of single-molecule fluorescence imaging to real problems in microbiology,” *Molecular Microbiology*, *in press* (2012).
- JSB**, “Moving toward the Future of Single-Molecule-Based Super-Resolution Imaging,” *Biopolymers*, **95** 287 (2011).

### ***Previous Research***

- JSB**, E.D. Goley, L. Shapiro and W.E. Moerner, “Three-Dimensional Super-Resolution Imaging of the Midplane Protein FtsZ in Live *Caulobacter crescentus* Cells Using Astigmatism,” *ChemPhysChem*, **13** 1007 (2012).
- JSB** and W.E. Moerner, “Single-Molecule and Superresolution Imaging in Live Bacteria Cells,” *Cold Spring Harbor Perspectives in Biology*, **2** a000448 (2010).
- M.A. Thompson, **JSB**, S. J. Lord, N.R. Conley and W. E. Moerner, “Molecules and Methods for Super-Resolution Imaging,” *Methods in Enzymology*, **475** 27 – 59 (2010).
- S.R.P. Pavani, M.A. Thompson, **JSB**, S.J. Lord, N. Liu, R.J. Twieg, R. Piestun and W.E. Moerner, “Three-Dimensional Single-Molecule Fluorescence Imaging Beyond the Diffraction Limit Using a Double-Helix Point Spread Function,” *PNAS*, **106** 2995 – 2999 (2009).
- JSB**, M.A. Thompson, N.K. Tselentis, G.R. Bowman, L. Shapiro and W.E. Moerner, “Superresolution Imaging in Live *Caulobacter Crescentus* Cells Using Photoswitchable EYFP,” *Nature Methods*, **5** 947 – 949 (2008).

## REFEREED JOURNAL PUBLICATIONS

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- M.C. Traub, **JSB**, D.J. Michalak, L.J. Webb, B.S. Brunshwig and N.S. Lewis, “Phosphine Functionalization of GaAs(111)A Surfaces,” *Journal of Physical Chemistry C, J. Phys. Chem. C*, **112** 18467 – 18473 (2008).
- N.R. Conley, **JSB**, W.E. Moerner, “Cy3-Cy5 Covalent Heterodimers for Single-Molecule Photoswitching,” *Journal of Physical Chemistry B*, **112** 11878 – 11880 (2008).
- M.C. Traub, **JSB**, B.S. Brunshwig and N.S. Lewis, “Passivation of GaAs nanocrystals by chemical functionalization,” *Journal of the American Chemical Society*, **130** 955 – 964 (2008).
- JSB**, L.A. Sweatlock, H. Mertens, N.S. Lewis, H.A. Atwater and A. Polman, “Plasmon-enhanced photoluminescence of silicon quantum dots: Simulation and experiment,” *Journal of Physical Chemistry C*, **111** 13372 – 13377 (2007).
- H. Mertens, A. Polman, **JSB** and H.A. Atwater, “Polarization-Selective Plasmon-Enhanced Silicon Quantum Dot Luminescence,” *Nano Letters*, **6** 2622 – 2625 (2006).
- L.J. Webb, D.J. Michalak, **JSB**, B.S. Brunshwig, A.S.Y. Chan, D.W. Knapp, H.M. Meyer, E.J. Nemanick, M.C. Traub and N.S. Lewis, “High-Resolution Soft X-ray Photoelectron Spectroscopic Studies and Scanning Auger Microscopy Studies of the Air Oxidation of Alkylated Silicon(111) Surfaces,” *Journal of Physical Chemistry B*, **110** 23450 – 23459 (2006).
- M.C. Traub, **JSB**, D.J. Michalak, L.J. Webb, B.S. Brunshwig and N.S. Lewis, “High-resolution X-Ray photoelectron spectroscopy of chlorine-terminated GaAs(111)A surfaces,” *Journal of Physical Chemistry B*, **110** 15641 – 15644 (2006).
- JSB**, N.S. Lewis, H.A. Atwater, H. Mertens and A. Polman, “Tuning the spectral emission of plasmon-enhanced Si quantum dot luminescence,” *Applied Physics Letters*, **88** 131109 (2006).
- JSB**, D. Pacifici, N.S. Lewis and H.A. Atwater, “Enhanced radiative emission rate and quantum efficiency in coupled silicon nanocrystal-nanostructured gold emitters,” *Nano Letters*, **5** 1768 – 1773 (2005).
- A.L. Tchegotareva, M.J.A. de Dood, **JSB**, H.A. Atwater and A. Polman, “Quenching of Si nanocrystal photoluminescence by doping with gold or phosphorous,” *Journal of Luminescence*, **114** 137 – 144 (2005).
- L.J. Webb, E.J. Nemanick, **JSB**, D.W. Knapp, D.J. Michalak, M.C. Traub, A.S.Y. Chan, B.S. Brunshwig and N.S. Lewis, “High-resolution X-ray photoelectron spectroscopic studies of alkylated silicon(111) surfaces,” *Journal of Physical Chemistry B*, **109** 3930 – 3937 (2005).
- JSB**, N.S. Lewis, H.A. Atwater and A. Polman, “Size-dependent oxygen-related electronic states in silicon nanocrystals,” *Applied Physics Letters*, **84** 5389 – 5391 (2004).
- JSB**, J.M. Geremia and H. Rabitz, “Closed-loop quantum control utilizing time domain maps,” *Chemical Physics*, **290** 35 – 45 (2003).
- JSB**, J.M. Geremia and H. Rabitz, “Optimal quantum control field design using logarithmic maps,” *Chemical Physics Letters*, **348** 440 – 446 (2001).

## BOOK CHAPTERS

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**JSB**, “Live-Cell Single-Molecule Imaging,” *Encyclopedia of Biophysics*, *submitted* (2011).

**JSB**, “Photoactivated Localization Microscopy (PALM),” *Encyclopedia of Biophysics*, *submitted* (2011).

**JSB**, L. Shapiro and W.E. Moerner, “Exploring Protein Superstructures and Dynamics in Live Bacterial Cells Using Single-Molecule and Superresolution Imaging,” *Methods in Molecular Biology*, **783** 139 (2011).

## CONFERENCE PUBLICATIONS

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**JSB** and W.E. Moerner, “Live-cell single-molecule and superresolution imaging of proteins in bacteria,” *SPIE Proceedings*, **7905** 790523 (2011).

**JSB**, M.A. Thompson, N.K. Tselentis, G.R. Bowman, L. Shapiro and W.E. Moerner, “Superresolution Imaging in Live *Caulobacter Crescentus* Cells Using Photoswitchable Enhanced Yellow Fluorescent Protein,” *SPIE Proceedings*, **7185** 71850I (2009).

**JSB**, M.A. Thompson, N.K. Tselentis, L. Shapiro and W.E. Moerner, “Superresolution Imaging in Live Bacterial Cells by Single-Molecule Active-Control Microscopy,” *CLEO/QELS Extended Abstracts*, **CFT2** (2008).

**JSB**, A.L. Tchebotareva, A. Polman, N.S. Lewis and H.A. Atwater, “Controlled passivation and luminescence blue shifts of isolated silicon nanocrystals,” *MRS Proceedings*, **770** I6.2.1 (2003).

## INVITED TALKS AND SEMINARS

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I have presented my research on many occasions, including the following invited presentations since beginning as an assistant professor at the University of Michigan:

### 2012

October	University of Illinois Cell and Molecular Biology and Molecular Biophysics Training Grant Symposium Keynote Speaker	Urbana, IL
April	Omaha Imaging Symposium	Omaha, NE
March	Pittcon Conference and Expo	Orlando, FL

### 2011

September	University of Michigan Molecular, Cellular and Developmental Biology Seminar Series	Ann Arbor, MI
March	Oakland University Chemistry Seminar Series	Rochester, MI
February	Ecole Polytechnique Federale de Lausanne	Lausanne, Switzerland
February	Columbia University Mechanical and Biomedical Engineering Seminar Series	New York, NY
January	SPIE Photonics West Meeting	San Francisco, CA

### 2010

October	University of Michigan Chemical Engineering Seminar Series	Ann Arbor, MI
October	University of Michigan Physics Seminar Series	Ann Arbor, MI
September	University of Wisconsin Distinguished Lectures in Microbiology	Madison, WI

### 2009

December	Duke University Center for Molecular and Biomolecular Imaging Meeting	Durham, NC
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## TEACHING EXPERIENCE

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### University of Michigan

Instructor, Chem 571: Graduate Quantum Chemistry 2011  
Instructor, Chem 454: Biophysical Chemistry II 2010  
Instructor, Chem 571: Graduate Quantum Chemistry 2010

### Stanford University

Occasional Lecturer, Ch 175: Physical Chemistry 2008  
Physics Summer Research Program Mentor 2007

### California Institute of Technology

Teaching Assistant, Occasional Lecturer, APh 132: Optoelectronic Devices and Nanophotonics 2005  
Teaching Assistant, Occasional Lecturer, APh 114: Solid State Physics 2005  
Summer Undergraduate Research Fellowship Mentor 2004  
Teaching Assistant, APh/EE 183: Device Physics 2004  
Teaching Assistant, Ch 3a: Undergraduate General Chemistry Lab 2001 – 2002

### Princeton University

Teaching Assistant, Ch 372: Junior Experimental Chemistry Lab 2001  
Peer Tutor: Undergraduate Math, Physics and Chemistry 1998 – 2001

## MENTORING

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### Current Lab Members

Ben Coupland, Applied Physics (2010 –)  
Beth Leverett Haas, Chemistry (2010 –)  
Yi Liao, Chemistry (2011 –)  
Jessica Donehue, Chemistry (2011 –)  
David Rowland, Biophysics (2012 –)  
  
Dr. Mou-Chi Cheng, Postdoc (2010 –)  
Dr. Esther Wertz, Postdoc (2011 –)  
Dr. Krishanthi Karunatilaka (2011 –)  
  
Courtney Talicska, Undergrad (2012 –)

### Former Students

Li Zi, Chemistry Rotator (Fall 2011)  
Xie Yue, Chemistry Rotator (Fall 2011)  
John Myers, Chemistry Rotator (Summer 2011)  
Michael Bell, Bioinformatics Rotator (Fall 2010)  
Christina Franzese, Chemistry Rotator (Fall 2010)  
Maxim Burgman, Chemistry Rotator (Summer 2010)  
Janghyun Lee, Chemistry Rotator (Winter 2010)  
Josh Jasensky, Biophysics Rotator (Winter 2010)  
  
Austin Leske, Undergrad (2011 – 2012)  
Rachel Wein, Undergrad (2010 – 2011)  
John Seong Kyu Yang, Undergrad (2010 – 2011)  
Kaitlyn Hagan, Undergrad (2010 – 2011)  
Kelsey Rosenthal, UROP Undergrad (2009 – 2010)

## **ACTIVE COLLABORATIONS**

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Professor Vic DiRita, Dr. Jyl Matson (UM Microbiology and Immunology)  
*Investigations of the regulatory pathway controlling pathogenicity in Vibrio cholera*

Professor Eric Martens, Dr. Nicole Koropatkin (UM Microbiology and Immunology)  
*Studies of the mechanism of carbohydrate catabolism in the gut symbiont Bacteroides thetaiotaomicron*

Professors Shuichi Takayama (UM Biomedical Engineering) and Mark Burns (UM Chemical Engineering)  
*Superresolution investigations of DNA in adjustable nanochannels*

Professor Adam Matzger (UM Chemistry)  
*Characterization of single molecules in mesoporous crystals*

Professor Lyle Simmons (UM Molecular, Cellular and Developmental Biology)  
*Characterization of single molecules in mesoporous crystals*

## **OTHER PROFESSIONAL ACTIVITIES**

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Current Professional Society Memberships:

American Chemical Society (ACS), Biophysical Society (BPS), American Physical Society (APS)

Guest Editor:

Biopolymers special issue on “Single-Molecule-Based Superresolution Imaging,” May 2011, volume 95, issue 5.

Reviewer:

NSF, Nature Nanotechnology, Nano Letters, Nature Methods, ACS Nano, Molecular Microbiology, Proceedings of the National Academy of Sciences, Journal of the American Chemical Society, Applied Physics Letters, Journal of Applied Physics, Journal of Physical Chemistry, Optics Letters, Biopolymers and Europhysics Letters.

Outreach:

Chemistry Day Demos and the Ann Arbor Hands-on-Museum, Michigan Mentorship Program, UM Preparing Future Faculty Panelist, Michigan Research Community Seminar Speaker, Workshop Leader for the Stanford Society of Women Engineers Exploring New Worlds program.

Furthering Opportunities for Women in Science and Engineering:

UM Association for Women in Science mentor, UM Women in Science and Engineering panelist, Stanford Distinguished Women in Science Seminar Steering Committee, Stanford Chemistry Grad Students Association Panelist, Caltech Women in Engineering, Science and Technology.