

Shannon W. Boettcher
Department of Chemistry
California Institute of Technology
Mail Code 127-72
Pasadena, CA 91125
805-452-4709

sboettch@caltech.edu
<http://midnight.caltech.edu/sboettcher/>

ACADEMIC PREPARATION

Kavli Nanoscience Institute Prize Postdoctoral Scholar

California Institute of Technology, Pasadena

Advisors: Profs. Nate Lewis (*Chemistry*) and Harry Atwater (*Applied Physics*)

July 2008
- Present

Ph.D. Inorganic Chemistry

University of California, Santa Barbara

Advisor: Prof. Galen Stucky; NSF Graduate Research Fellow

2003-2008

B.A. Honors in Chemistry

University of Oregon, Eugene

Honors College Graduate, Minor in Physics, Goldwater Fellow

1998-2003

High School Diploma

Creswell High School, Creswell, OR

Valedictorian, Varsity Athletics

1994-1998

PEER-REVIEWED PUBLICATIONS

- (15) **Boettcher, S.W.**; Berg, S.; Schierhorn, M.S.; Strandwitz, N.C.; Lonergan, M.C.; Stucky, G.D., Ionic-ligand-controlled electrochemical doping of inorganic nanoparticle solids. *Nanoletters*, **2008**, 8(10) 3404.
- (14) Strandwitz, N.C.; Kahn, A.; **Boettcher, S.W.**; Mikhailovsky, A.A.; Hawker, C.J.; Nguyen, T.Q.; Stucky, G.D., One and Two-Photon Induced Polymerization of Methylmethacrylate using colloidal CdS semiconductor quantum dots. *J. Amer. Chem. Soc.* **2008**, 130(26) 8280.
- (13) Schierhorn, M.S.; **Boettcher, S.W.**; Ivanovskaya, A.; Norvell, E.; Sherman, J.B; Stucky, G.D.; Moskovits, M., Fabrication and photoelectrochemical testing of CdSe Nanorod Arrays. *J. Phys. Chem. C.* **2008** 112(23) 8516.
- (12) Fan, J.; **Boettcher, S.W.**; Tsung, C.-K.; Shi, Q.; Schierhorn, M.; Stucky, G.D., Field-Directed and Confined Molecular Assembly of Mesostructured Materials: Basic Principles and New Opportunities. *Chem. Mater.* **2008**, 20(3) 909.
- (11) **Boettcher, S.W.**; Strandwitz, N.C.; Schierhorn, M.; Lock, N.; Lonergan, M.C.; Stucky, G.D., Tunable electronic interfaces between bulk semiconductors and ligand-stabilized nanoparticle assemblies. *Nature Mater.* **2007**, 6(8), 592. (Highlighted in News and Views, Korgel, B.A., *Nat. Mater.* **2007**, 6(8), 551 and *Nano Today* **2007**, 2(4), 10)
- (10) **Boettcher, S.W.**; Fan, J.; Tsung, C.K.; Shi, Q.H.; Stucky, G.D., Harnessing the Sol-Gel Process for the Assembly of Non-Silicate Mesostructured Oxide Materials. *Acc. Chem. Res.* **2007**, 40(9), 784. **(Cover)**
- (9) Schierhorn, M.; Lee, S.J.; **Boettcher, S.W.**; Stucky, G.D.; Moskovits, M., Metal-silica hybrid nanostructures for surface-enhanced Raman spectroscopy. *Adv. Mater.* **2006**, 18(21), 2829. **(Cover)**
- (8) Fan, J.; **Boettcher, S.W.**; Stucky, G.D., Nanoparticle assembly of ordered multicomponent mesostructured metal oxides via a versatile sol-gel process. *Chem. Mater.* **2006**, 18(26), 6391.
- (7) **Boettcher, S.W.**; Bartl, M.H.; Hu, J.G.; Stucky, G.D., Structural analysis of hybrid titania-based mesostructured composites. *J. Am. Chem. Soc.* **2005**, 127(27), 9721.
- (6) Bartl, M.H.; **Boettcher, S.W.**; Frindell, K.L.; Stucky, G.D., 3-D molecular assembly of function in titania-based composite material systems. *Acc. Chem. Res.* **2005**, 38(4), 263.

- (5) Andersson, M.; Birkedal, H.; Franklin, N.R.; Ostomel, T.; **Boettcher, S.W.**; Palmqvist, A.E.C.; Stucky, G.D., Ag/AgCl-loaded ordered mesoporous anatase for photocatalysis. *Chem. Mater.* **2005**, 17(6), 1409.
- (4) Cheng, C.H.W.; **Boettcher, S.W.**; Johnston, D.H.; Lonergan, M.C., Unidirectional current in a polyacetylene hetero-ionic junction. *J. Am. Chem. Soc.* **2004**, 126(28), 8666.
- (3) Bartl, M.H.; **Boettcher, S.W.**; Hu, E.L.; Stucky, G.D., Dye-activated hybrid organic/inorganic mesostructured titania waveguides. *J. Am. Chem. Soc.* **2004**, 126(35), 10826.
- (2) Jin, S.; Popp, F.; **Boettcher, S.W.**; Yuan, M.; Oertel, C.M.; DiSalvo, F.J., Synthesis, characterization and properties of $\text{Mo}_6\text{S}_8(4\text{-tert-butylpyridine})_6$ and related $\text{M}_6\text{S}_8\text{L}_6$ cluster complexes (M = Mo, W). *J. Chem. Soc. Dalton Trans.* **2002**(16), 3096.
- (1) Daniels-Hafer, C.; Jang, M.; **Boettcher, S.W.**; Danner, R.G.; Lonergan, M.C., Tuning charge transport at the interface between indium phosphide and a polypyrrole-phosphomolybdate hybrid through manipulation of electrochemical potential. *J. Phys. Chem. B.* **2002**, 106(7), 1622.

PUBLICATIONS IN PROGRESS

- (1) **Boettcher, S.W.**; Schierhorn, M.; Strandwitz, N.C.; Lonergan, M.C.; Stucky, G.D., Synthesis and electrochemical characterization of anionic gold nanoparticle films and anionic-cationic gold nanoparticle bilayers. *To be submitted, J. Phys. Chem. C.* **2008**.
- (2) Strandwitz, N.C.; **Boettcher, S.W.**; Chan, R., Stucky, G.D. High-Temperature-Stable Au@CeO₂ Rattle-Type Catalysts. *In preparation*.
- (3) Nonoguchi, Y; Strandwitz, N.C.; **Boettcher, S.W.**; Stucky, G.D. Photopolymerization of Pyrrole in Ordered Mesoporous TiO₂. *In preparation*.

NATIONAL CONFERENCE PRESENTATIONS

- American Chemical Society, Spring 2005 and 2008
- Materials Research Society, Spring 2005 and 2007

SIGNIFICANT AWARDS

- | | |
|--|--------------|
| • Kavli Prize Postdoctoral Fellowship (Caltech) | 2008-present |
| • UC Chancellor's Fellowship (UCSB) | 2006-2007 |
| • NSF Graduate Research Fellowship (UCSB) | 2003-2006 |
| • Presidents Award (excellence in the completion of a senior thesis) | 2003 |
| • Barry M. Goldwater Fellowship (U. Oregon) | 2001-2003 |
| • Presidential Scholarship (Full Tuition, U. Oregon) | 1998-2002 |

ADDITIONAL PERTINENT EXPERIENCE

- | | |
|---|-----------|
| • Summer School on Neutron and X-Ray Scattering – Argonne National Labs | 2004 |
| • General Chemistry Lab TA – UC Santa Barbara | 2003-2004 |
| • NSF REU Program at Cornell University – Advisor, Francis J. DiSalvo | 2001 |
| • Undergraduate Research U. Oregon – Advisor, Mark. C. Lonergan | 1999-2003 |
| • Computer Support Technician – Dept. Architecture, U. Oregon | 1998-1999 |

MENTORING EXPERIENCE

- | | |
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| • Mr. David Marsh, NNIN REU Student from U. Buffalo | 2007 |
| • Mr. Sebastian Berg - Research Exchange student from U. Muenster, Germany | 2007 |

- Ms. Stephanie Petrina - NNIN REU student from Virginia Tech, currently pursuing graduate studies at Penn. State 2006
- Ms. Nina Lock - Danish Research Exchange Student currently pursuing graduate studies at U. Aarhus, Denmark 2005