

JONAS I. GOLDSMITH

jigoldsmi@brynmawr.edu

Department of Chemistry
Bryn Mawr College
101 N. Merion Avenue
Bryn Mawr, PA 19010
(610)-526-5137

EDUCATION

Cornell University, Ithaca, NY

Ph.D. in Inorganic/Physical Chemistry, August 2002

Advisor: Professor Héctor D. Abruña

Cornell University, Ithaca, NY

Master of Science in Inorganic/Physical Chemistry, June 1999

Swarthmore College, Swarthmore, PA

Bachelor of Arts in Chemistry, with Distinction, May 1996

PROFESSIONAL EXPERIENCE

Assistant Professor of Physical Chemistry

2005 - present

Department of Chemistry, Bryn Mawr College, Bryn Mawr, PA

Teaching General Chemistry, Physical Chemistry, Special Topics in Nanoscience.

Conducting research to synthesize and investigate novel transition metal complexes for surface functionalization. Utilizing electrochemical techniques to examine adsorption dynamics. Exploring transition metal complexes for photocatalytic hydrogen generation with spectroscopic and electrochemical techniques.

Post-doctoral Researcher

2004 – 2005

Advisor: Professor Stefan Bernhard, Princeton University, Princeton, NJ

Employed combinatorial methods to develop novel photosensitizers and electron transfer mediators, based on transition metal complexes for use in photoinduced water splitting. Developed high-throughput screening and analysis techniques to discover and optimize effective hydrogen production methodologies.

Visiting Assistant Professor of Physical Chemistry

2003 - 2004

Department of Chemistry, Hobart and William Smith Colleges, Geneva NY

Chair: Professor Walter J. Bowyer

Taught Physical Chemistry lecture and laboratory to a class of 24 students.

Incorporated many new laboratory experiments into curriculum. Conducted research to synthesize transition metal complexes for use in carbon nanotube sensors.

PROFESSIONAL EXPERIENCE (cont.)

Post-doctoral Researcher 2002 – 2003

Advisors: Professor Alan T. Johnson (Department of Physics) and
Professor Alan G. MacDiarmid (Department of Chemistry)
University of Pennsylvania, Philadelphia, PA

Synthesized and characterized conducting polymer nanofibers. Made the first measurements of electrical transport on individual, pure, polyaniline nanofibers produced by interfacial polymerization techniques. Employed atomic force microscopy, scanning conductance microscopy, scanning electron microscopy, micro/nanofabrication techniques as well as electrical transport measurements to characterize devices made from these polymer nanofibers. Found that the electrical properties of these devices could be modulated by controlled chemical exposure.

Graduate Research Assistant 1998 – 2002

Advisor: Professor Héctor D. Abruña, Cornell University, Ithaca, NY

Explored transport and electron transfer kinetics of redox dendrimers using standard electrochemical techniques as well as ultra-fast cyclic voltammetry and pulsed field gradient spin-echo nuclear magnetic resonance. Investigated deviations from classical electrochemical behavior in macromolecular transition metal complexes. Synthesized and characterized novel transition metal-polypyridyl complexes for materials and nanotechnology applications.

Graduate Teaching Assistant 1997 – 2001

Department of Chemistry and Chemical Biology, Cornell University, Ithaca, NY
Electrochemistry (graduate class), Honors General Chemistry

Undergraduate Researcher 1995 – 1996

Advisor: Professor Robert F. Pasternack, Swarthmore College, Swarthmore, PA

Investigated the thermodynamics of chiral DNA/porphyrin aggregate formation using circular dichroism, resonance light scattering, fluorescence and UV/Vis absorbance spectroscopy.

Undergraduate Researcher Summer 1994

Advisor: Professor Joseph P. Dinnocenzo, University of Rochester, Rochester, NY

Synthesized several para-substituted phenylcyclopropanes and studied their kinetics of photo-induced charge transfer using nanosecond and picosecond laser flash photolysis.

Undergraduate Teaching Assistant 1993 – 1996

Department of Chemistry, Swarthmore College, Swarthmore, PA
General, Inorganic and Physical Chemistry

GRANTS AND AWARDS

Faculty Research Grant (\$4900) 2009-2010

Bryn Mawr College, Bryn Mawr, PA

Awarded by the Committee on Faculty Awards and Grants for developing methodologies to conduct electrochemical experiments at edge-plane pyrolytic graphite surfaces.

Type G Starter Grant (\$40,000)	2007-2009
Petroleum Research Fund of the American Chemical Society “Rational Self Assembly of Macromolecular Arrays for Optimized Light Harvesting and Photocatalytic Hydrogen Production”	
Faculty Research Grant (\$3746)	2007-2008
Bryn Mawr College, Bryn Mawr, PA Awarded by the Committee on Faculty Awards and Grants for the construction of a multi-well apparatus to examine the photocatalytic reduction of water to hydrogen.	
PCNMCG Instrument Grant (\$9,000)	June 2006
Pittsburgh Conference National Memorial College Grant Program Grant for the purchase of a bipotentiostat and rotating ring-disc electrodes	
Faculty Start-up Award (\$30,000)	2005-2010
Camille and Henry Dreyfus Foundation “Non-covalent functionalization of single-walled carbon nanotubes via molecular interfaces based on polypyridyl transition metal complexes”	
Faculty Research Grant	May 2003
Hobart and William Smith Colleges, Geneva, NY Awarded by the Committee on Faculty Research and the Provost to support research on electron transfer in linear macromolecular transition metal complexes	
Wentink Outstanding Graduate Student Award	April 2002
Department of Chemistry and Chemical Biology, Cornell University, Ithaca, NY Awarded to graduate students who have distinguished themselves both academically and in the quality and quantity of their research	
Stanley Adamson Prize in Chemistry	May 1995
Department of Chemistry, Swarthmore College, Swarthmore, PA Awarded to the outstanding junior in the Chemistry Department	

GRANTS PENDING OR NOT FUNDED

Partnership for Research and Education in Materials (\$3,464,676)	Pending
National Science Foundation “Bryn Mawr/Northwestern Partnership for Nanomaterials Research and Education”	
Cottrell Scholar Award	NOT FUNDED
Research Corporation “Optimized Light Harvesting and Photo-induced Hydrogen Production via Guided Self-Assembly on Surfaces and Colloidal Nanoparticles”	
Type G Starter Grant	NOT FUNDED
Petroleum Research Fund of the American Chemical Society	
	2005

“Investigation of Adsorption Dynamics and Electron Transfer in Transition Metal Complexes Bound to Carbon Surfaces via π -Stacking”

PRESENTATIONS

“Selective noncovalent functionalization of glassy carbon with cobalt (II) terpyridyl complexes” 237th National Meeting of the American Chemical Society, Salt Lake City, UT, March 22, 2009.

“Modification of single-walled carbon nanotubes with transition metal complexes” 237th National Meeting of the American Chemical Society, Salt Lake City, UT, March 26, 2009.

“Two Variations on the Theme of Electron Transfer: Surface Modification and Solar Energy Conversion” Swarthmore College, Swarthmore PA, September 20, 2007.

“Non-covalent adsorption of polypyridyl complexes to carbon surfaces: synthesis and electrochemistry of a family of Co(II) complexes with pendant polyaromatic functionalities.” Rachel L. Usala, Eden McQueen, Hillary L. Smith and Jonas I. Goldsmith. Poster presented at the Middle Atlantic Regional Meeting of the American Chemical Society (MARM-ACS), Collegeville, PA May 16, 2007.

“Heteroleptic ruthenium (II) terpyridine complexes for the non-covalent functionalization of glassy carbon surfaces.” Samira Zamani and Jonas I. Goldsmith. Poster presented at MARM-ACS Collegeville, PA May 16, 2007.

“Control of Carbon Surface Modification via Ligand Modifications.” Hillary Smith, Rachel Usala, Eden McQueen, Jonas I. Goldsmith. Poster presented at the Gordon Conference on Electrochemistry, Ventura CA, January 15, 2007.

“Introduction to Nanoscience” Lego Robotics Team *Rage Against the Machine* (grade school students) July 27, 2006

Panelist “Science of Energy: Is there an Alternative to Fossil Fuels” at “Conference on Energy Insecurity: Fuel for Conflict”, Haverford College, April 1, 2006.

“Transition Metal Complexes for Light Harvesting and Nano-scale Surface Functionalization” Haverford College, Haverford, PA. February 10, 2006

“Pyrene-terpyridine Ligand for Functionalization of Carbon Surfaces with Transition Metal Complexes.” Poster presented at the American Chemical Society’s 228th National Meeting, Philadelphia, PA. August 24, 2004.

“Chemical Approaches to Nanosciences Employing Transition Metal Complexes.” Poster presented at the American Chemical Society’s 228th National Meeting, Philadelphia, PA. August 23, 2004.

“A Chemical Approach to Nanotechnology.” Hobart and William Smith Colleges, Geneva, NY. October 2, 2003.

PRESENTATIONS (cont.)

“Electron Transfer at the Spatiotemporal Limits.” NSEC Seminar, Columbia University, New York, NY. April 22, 2002.

“Electron Transfer at the Spatiotemporal Limits.” University of Pennsylvania, Philadelphia, PA. May 1, 2002.

“Spatial and Temporal Aspects of Electron Transfer.” Wentink Symposium, Cornell University, Ithaca, NY. May 8, 2002.

“Electron Transfer in Dendritic Materials; Transition Metal Complex Building Blocks for Nanoscale Devices” Jonas I. Goldsmith, Jiwoong Park, Abhay N. Pasupathy, Connie Chang, Yuval Yaish, Jason Petta, Marie Rinkowski, James P. Sethna, Daniel C. Ralph, Paul L. McEuen, Héctor D. Abruña. Poster presented at the Polymer Outreach Program, Cornell University, Ithaca, NY. May 20, 2002.

PUBLICATIONS

Goldsmith, J. I.; Smith, H. L.; McQueen, E. W.; “Novel polyaromatic-terminated transition metal complexes for the functionalization of carbon surfaces.” *Manuscript in preparation*.

1. Lowry, M. S.; Goldsmith, J. I.; Slinker, J. D.; Pascal, R. A. Jr.; Malliaras, G. G.; Bernhard, S. “High Energy Emission from a Single-Layer Iridium (III) Electroluminescent Device.” *Chem. Mat.* **2005**; *17*(23); 5712-5719.
2. Goldsmith, J.I.; Hudson, W.R.; Lowry, M.S.; Bernhard, S. "Discovery and High-Throughput Screening of Heteroleptic Iridium Complexes for Photo-Induced Hydrogen Production." *J. Am. Chem. Soc.*, **2005**, *127*(20), 7502-10.
3. Sydora, O.L.; Goldsmith, J.I.; Vaid, T. P.; Miller, A. E.; Wolczanski, P. T.; and Abruña, H. D. “Syntheses and electrochemistry of (*p*-XC₆H₄O)₆W (1-X, X = H, CH₃, OCH₃, Cl, Br, OH, OCH₂Ph) and (*p*-XC₆H₄O)₅W(OC₆H₄OH) (X = H, CH₃, OCH₃, Cl, Br): an approach to electrocatalytic CH bond activation.” *Polyhedron*, **2004**, *23*(11), 2841-56.
4. Takada, K.; Goldsmith, J.I.; Bernhard, S.; Abruña, H.D. “Dendrimers on Electrodes” in *Encyclopedia of Electrochemistry*, Volume 10, A.J. Bard and M. Stratmann, editors WILEY-VCH, Weinheim, Berlin, **2004**.
5. Bernhard, S.; Goldsmith, J.I.; Takada, K.; Abruña, H.D. “Iron (II) and Copper(I) Coordination Polymers: Electrochromic Materials with and without Chiroptical Properties.” *Inor. Chem.*, **2003**, *42*(14), 4389-93.
6. Amatore, C.; Bouret, Y.; Maisonhaute, E.; Abruña, H.D.; Goldsmith, J.I. “Electrochemistry within Molecules Using Ultrafast Cyclic Voltammetry.” *Comptes Rendus Chemie*, **2003**, *6*(1), 99-115.

PUBLICATIONS (cont.)

7. Park, J.; Pasupathy, A.N.; Goldsmith, J.I.; Soldatov, A.V.; Chang, C.; Yaish, Y.; Sethna, J.P.; Abruña, H.D.; Ralph, D.C.; McEuen, P.L. "Wiring up Single Molecules." *Thin Solid Films*, **2003**, 438-439, 457-461.
8. Park, J.; Pasupathy, A.N.; Goldsmith, J.I.; Chang, C.; Yaish, Y.; Petta, J.R.; Rinkoski, M.; Sethna, J.P.; Abruña, H.D.; McEuen, P.L.; Ralph, D.C. "Coulomb Blockade and the Kondo Effect in Single Atom Transistors." *Nature*, **2002**, 417, 722-725.
9. Goldsmith, J.I.; Takada, K.; Abruña, H.D. "Probing Diffusional Transport in Redox-active Dendrimers." *J. Phys. Chem B.*, **2002**, 106(34), 8504-8513.
10. Amatore, C.; Bouret, Y.; Maisonhaute, E.; Goldsmith, J.I.; Abruña, H.D. "Precise Adjustment of Nanometric-Scale Diffusion Layers Within a Redox Dendrimer Molecule By Ultrafast Cyclic Voltammetry: an Electrochemical Nanometric Microtome." *Chem--Eur.J.*, **2001**, 7 (10), 2206-2226.
11. Amatore, C.; Bouret, Y.; Maisonhaute, E.; Goldsmith, J.I.; Abruña, H.D. "Ultrafast Voltammetry of Adsorbed Redox Active Dendrimers with Nanometric Resolution: An Electrochemical Microtome." *ChemPhysChem*, **2001**, 2 (2), 130-134.
12. Takada, K.; Storrer, G.D.; Goldsmith, J.I.; Abruña, H.D. "Electrochemical and Adsorption Properties of PAMAM Dendrimers Surface-Functionalized with Polypyridyl Cobalt Complexes." *J. Phys. Chem. B*, **2001**, 105, 2404-2411.
13. Pasternack, R.F.; Goldsmith, J.I.; Szep, S.; Gibbs, E.J. "A Spectroscopic and Thermodynamic Study of Porphyrin/DNA Supramolecular Assemblies." *Biophys.J.*, **1998**, 75, 1024-31.
14. Potter, T.L.; Fagerson, I.S.; Goldsmith, J.I. "Mysteries of Maple Syrup Flavor." *Maple Syrup Digest*, **1995**, 7A (2), 9-13.

PROFESSIONAL ORGANIZATIONS

- American Chemical Society
- Electrochemical Society

COURSES TAUGHT

CHEM 103 General Chemistry I

CHEM 104 General Chemistry II

CHEM 321/521 Advanced Physical Chemistry: Topics in Nanoscience

CHEM 222 Physical Chemistry II

CHEM 252 Research Methodology

CHEM 251 Research Methodology

SERVICE ACTIVITIES

- Textbook Reviewer for Academic Press
- Reviewer for the Journal of Electroanalytical Chemistry
- Proposal Reviewer for NSF Inorganic Division
- Physical Chemist Search Committee (Haverford College)

- Committee on Libraries, Information Services and Computing 2007-10
- Chemistry Representative to Environmental Studies Concentration 2006-present
- Director of Graduate Studies in Chemistry 2006
- Physical Chemist Search Committee (Haverford College) 2005
- Science Node Representative 2005-present
- Chemistry Colloquium Coordinator 2005, 2009

RESEARCH STUDENTS

- Hillary Smith '05
- Rachel Usala '06
- Samira Zamani '06
- Danielle Carlin '06
- Eden McQueen '09
- Amy Case '07
- Kristin Kurek (GS) M.A. 2008
- Suzanne Ali, '09
- Erica Lo '09