David F. Watson

University at Buffalo
Department of Chemistry
531 Natural Sciences Complex
Buffalo, NY 14260-3000

email: dwatson3@buffalo.edu
phone: (716) 645-4189
fax: (716) 645-6963

Education

1996	B.S. in Chemistry with Departmental Honors, Haverford College
1997	M.S. in Chemistry, Northwestern University
2001	Ph.D. in Chemistry, Princeton University Dissertation: *Photochemistry and Spectroscopy of Trinuclear Transition Metal Mixed-Valence Complexes.* Advisor: Andrew B. Bocarsly.
2001-2004	Postdoctoral Fellow, Johns Hopkins University. Advisor: Gerald J. Meyer

Professional Appointments

2016-	Chair, Department of Chemistry, University at Buffalo
2015-	Professor of Chemistry, University at Buffalo
2010-2015	Associate Professor of Chemistry, University at Buffalo
2004-2010	Assistant Professor of Chemistry, University at Buffalo
2001-2004	Postdoctoral Fellow, Johns Hopkins University. Advisor: Gerald J. Meyer.

Publications (ORCID ID: 0000-0003-1203-2811)

University at Buffalo (refereed journal articles)

1. Dibbell, R.S.; Soja, G.R.; Hoth, R.M.; Watson, D.F. "Photocatalytic Patterning of Monolayers for the Site-Selective Deposition of Quantum Dots onto TiO_2 Surfaces." *Langmuir* **2007,** *23,* 3432-3439. DOI:10.1021/la063161a
2. Mann, J.R.; Watson, D.F. "Adsorption of CdSe Nanoparticles to Thiolated TiO_2 Surfaces: Influence of Intralayer Disulfide Formation on CdSe Surface Coverage." *Langmuir* **2007,** *23,* 10924-10928. DOI:10.1021/la702127t
3. Soja, G.R.; Mann, J.R.; Watson, D.F. "Temporal Evolution of the Composition of Mixed Monolayers on Nanocrystalline TiO_2 Films." *Langmuir* **2008,** *24,* 5249-5252. DOI:10.1021/la800731p
4. Mann, J.R.; Gannon, M.K.; Fitzgibbons, T.C.; Detty, M.R.; Watson, D.F. "Optimizing the Photocurrent Efficiency of Dye-Sensitized Solar Cells through the Controlled Aggregation of Chalcogenoxanthylium Dyes on Nanocrystalline Titania Films." *J. Phys. Chem. C* **2008,** *112,* 13057-13061. DOI:10.1021/jp803990b
5. Navarro, D.A.G.; Watson, D.F.; Aga, D.S.; Banerjee, S. "Natural Organic Matter-Mediated Phase Transfer of Quantum Dots in the Aquatic Environment." *Env. Sci. Tech.* **2009,** *43,* 677-682. DOI:10.1021/es8017623
6. Dibbell, R.S.; Watson, D.F. "Distance-Dependent Electron Transfer in Tethered Assemblies of CdS Quantum Dots and TiO_2 Nanoparticles." *J. Phys. Chem. C* **2009,** *113,* 3139-3149. DOI:10.1021/jp809269m
7. Soja, G.R.; Watson, D.F. "TiO_2-Catalyzed Photodegradation of Porphyrins: Mechanistic Studies and Application in Monolayer Photolithography." *Langmuir* **2009,** *25,* 5398-5403. DOI:10.1021/la804256f

8. Mann, J.R.; Nevins, J.S.; Soja, G.R.; Wells, D.D.; Levy, S.C; Marsh, D.A.; Watson, D.F. "Influence of Solvation and the Structure of Adsorbates on the Kinetics and Mechanism of Dimerization-Induced Compositional Changes of Mixed Monolayers on TiO_2." *Langmuir* **2009**, *25,* 12217-12228. DOI:10.1021/la901740d
9. Dibbell, R.S.; Youker, D.G.; Watson, D.F. "Excited-State Electron Transfer from CdS Quantum Dots to TiO_2 Nanoparticles via Molecular Linkers with Phenylene Bridges." *J. Phys. Chem. C* **2009,** *113,* 18643-18651. DOI:10.1021/jp9079469
10. Smith, A.R.; Watson, D.F. "Photochemically Triggered Assembly of Composite Nanomaterials through the Photodimerization of Adsorbed Anthracene Derivatives." *Chem. Mater.* **2010,** *22,* 294-304. DOI:10.1021/cm901821p
11. Navarro, D.A.G; Banerjee, S.; Aga, D.S.; Watson, D.F. "Partitioning of Hydrophobic CdSe Quantum Dots into Aqueous Dispersions of Humic Substances: Influence of Capping-Group Functionality on the Phase-Transfer Mechanism." *J. Coll. Interface Sci.* **2010,** *348,* 119-128. DOI:10.1016/j.jcis.2010.04.021
12. Watson, D.F. "Linker-Assisted Assembly and Interfacial Electron-Transfer Reactivity of Quantum Dot-Substrate Architectures." *J. Phys. Chem. Lett.* **2010,** *1,* 2299-2309. DOI:10.1021/jz100571u
13. Mulhern, K.R.; Detty, M.R.; Watson, D.F. "Aggregation-Induced Increase of the Quantum Yield of Electron Injection from Chalcogenorhodamine Dyes to TiO_2." *J. Phys. Chem. C.* **2011,** *115,* 6010-6018. DOI:10.1021/jp111438x
14. Celiz, M.D.; Colón, L.A.; Watson, D.F.; Aga, D.A. "A Study on the Effects of Humic and Fulvic Acids on Quantum Dot Nanoparticles using Capillary Electrophoresis with Laser Induced Fluorescence Detection." *Env. Sci. Tech.* **2011,** *45,* 2917-2924. DOI:10.1021/es1031097
15. Navarro, D.A.; Banerjee, S.; Watson, D.F.; Aga, D.S. "Differences in Soil Mobility and Degradability between Water-Dispersible CdSe and CdSe/ZnS Quantum Dots." *Env. Sci. Tech.* **2011,** *45,* 6343-6349. DOI:10.1021/es201010f
16. Baker, J.S.; Nevins, J.S.; Coughlin, K.M.; Colón, L.A.; Watson, D.F. "Influence of Complex-Formation Equilibria on the Temporal Persistence of Cysteinate-Functionalized CdSe Nanocrystals in Water." *Chem. Mater.* **2011,** *23,* 3546-3555. DOI:10.1021/cm2013347
17. Nevins, J.S.; Coughlin, K.M.; Watson, D.F. "Attachment of CdSe Nanoparticles to TiO_2 via Aqueous Linker-Assisted Assembly: Influence of Molecular Linkers on Electronic Properties and Interfacial Electron Transfer." *ACS Appl. Mater. Interfaces* **2011,** *3,* 4242-4253. DOI:10.1021/am200900c
18. Navarro, D.A.; Depner, S.W.; Watson, D.F.; Aga, D.S.; Banerjee, S.B. "Partitioning Behavior and Stabilization of Hydrophobically Coated HfO_2, ZrO_2 and $Hf_xZr_{1-x}O_2$ Nanoparticles with Natural Organic Matter Reveal Differences Dependent on Crystal Structure." *J. Hazard. Mater.* **2011,** *196,* 302-310. DOI:10.1016/j.jhazmat.2011.09.028
19. Cheng, K.-C.; Law, W.-C.; Yong, K.-T.; Nevins, J.S.; Watson, D.F.; Ho, H.-P.; Prasad, P.N. "Synthesis of Near-Infrared Silver-Indium-Sulfide ($AgInS_2$) Quantum Dots as Heavy-Metal Free Photosensitizer for Solar Cell Applications." *Chem. Phys. Lett.* **2011,** *515,* 254-257. DOI:10.1016/j.cplett.2011.09.027

20. Mulhern, K.M.; Orchard, A.; Watson, D.F.; Detty, M.R. “Influence of Surface-Attachment Functionality on the Aggregation, Persistence, and Electron-Transfer Reactivity of Chalcogenorhodamine Dyes on TiO_2.” *Langmuir* **2012,** *28,* 7071-7082. DOI:10.1021/la300668k
21. Sellers, D.G.; Watson, D.F. “Probing the Energetic Distribution of Injected Electrons at Quantum Dot-Linker-TiO_2 Interfaces” *J. Phys. Chem. C* **2012,** *116,* 19215-19224. DOI:10.1021/jp307196z
22. Kern, M.E.; Watson, D.F. “Influence of Solvation and the Persistence of Adsorbed Linkers on the Attachment of CdSe Quantum Dots to TiO_2 via Linker-Assisted Assembly.” *Langmuir* **2012,** *28,* 15598-15605. DOI:10.1021/la303504u
23. Stewart, D.T.R.; Noguera-Oviedo, K.; Lee, V.; Banerjee, S.; Watson, D.F.; Aga, D.S. “Quantum Dots Exhibit Less Bioaccumulation than Free Cadmium and Selenium in the Earthworm *Eisenia andrei*.” *Env. Toxicol. Chem.* **2013,** *32,* 1288-1294. DOI:10.1002/etc.2182
24. Mulhern, K.M.; Detty, M.R.; Watson, D.F. “Effects of Surface-anchoring Mode and Aggregation State on Electron Injection from Chalcogenorhodamine Dyes to Titanium Dioxide.” *J. Photochem. Photobiol. A: Chem.* **2013,** *264,* 18-25. DOI:10.1016/j.jphotochem.2013.04.028
25. Bedics, M.A.; Mulhern, K.R.; Watson, D.F.; Detty, M.R. “Synthesis and Photoelectrochemical Performance of Chalcogenopyrylium Monomethine Dyes Bearing Phosphonate/Phosphonic Acid Substituents.” *J. Org. Chem.* **2013,** *78,* 8885-8891. DOI:10.1021/jo401280s
26. Coughlin, K.M.; Nevins, J.S.; Watson, D.F. “Aqueous-Phase Linker-Assisted Attachment of Cysteinate(2-)-capped CdSe Quantum Dots to TiO_2 for Quantum Dot-Sensitized Solar Cells.” *ACS Appl. Mater. Interfaces* **2013,** *5,* 8649-8654. DOI:10.1021/am402219e
27. Kern, M.E.; Watson, D.F. “Influence of Dispersion Forces and Ordering on the Compositions of Mixed Monolayers of Alkanoic Acids on Nanocrystalline TiO_2 Films.” *Langmuir* **2013,** *29,* 13797-13807. DOI:10.1021/la4030519
28. Sabatini, R.P.; Eckenhoff, W.T.; Orchard, A.; Liwosz, K.R.; Detty, M.R.; Watson, D.F.; McCamant, D.W.; Eisenberg, R. “From Seconds to Femtoseconds: Solar Hydrogen Production and Transient Absorption of Chalcogenorhodamine Dyes.” *J. Am. Chem. Soc.* **2014,** *136,* 7740-7750. DOI:10.1021/ja503053s
29. Jarzembska, K.N., Chen, Y., Nasca, J.N., Trzop, E., Watson, D.F., and Coppens, P. "Relating Structure and Photoelectrochemcial Properties: Electron Injection by Structurally and Theoretically Characterized Transition Metal-Doped Phenanthroline-Polyoxotitanate Nanoparticles." *Phys. Chem. Chem. Phys.* **2014,** *16,* 15792-15795. DOI:10.1039/C4CP02509A
30. Kern, M.E.; Watson, D.F. “Linker-Assisted Attachment of CdSe Quantum Dots to TiO_2: Time- and Concentration-Dependent Adsorption, Agglomeration, and Sensitized Photocurrent.” *Langmuir* **2014,** *30,* 13294-13300. DOI:10.1021/la503211k
31. Pelcher, K.E.; Milleville, C.C.; Wangoh, L.; Chauhan, S.; Crawley, M.R.; Marley, P.M.; Piper, L.F.J.; Watson, D.F.; Banerjee, S. “Integrating β-$Pb_xV_2O_5$ Nanowires with CdSe Quantum Dots: Towards Nanoscale Heterostructures with Tunable Interfacial Energetic Offsets for Charge Transfer.” *Chem. Mater.* **2015,** *27,* 2468-2479. DOI:10.1021/cm504574h

32. Sellers, D.G.; Button, A.A.; Nasca, J.N.; Wolfe II, G.E.; Chauhan, S.; Watson, D.F. "Excited-State Charge Transfer within Covalently Linked Quantum Dot Heterostructures." *J. Phys. Chem. C* **2015,** *119,* 27737-27748. DOI:10.1021/acs.jpcc.5b07504
33. Kryman, M.W.; Nasca, J.N.; Watson, D.F.; Detty, M.R. "Selenorhodamine Dye-Sensitized Solar Cells: Influence of Structure and Surface-Anchoring Mode on Aggregation, Persistence, and Photoelectrochemical Performance." *Langmuir* **2016,** *32,* 1521-1532. DOI:10.1021/acs.langmuir.5b04275
34. Perera, S.; Hui, H.; Zhao, C.; Xue, H.; Sun, F.; Deng, C.; Gross, N.; Milleville, C.; Xu, X.; Watson, D.F.; Weinstein, B.; Sun, Y.-Y.; Zhang, S.; Zeng, H. "Chalcogenide Perovskites: An Emerging Class of Ionic Semiconductors." *Nano Energy* **2016,** *22,* 129-135. DOI:10.1016/j.nanoen.2016.02.020
35. Milleville, C.C.; Pelcher, K.E.; Sfeir, M.Y.; Banerjee, S.; Watson, D.F. "Directional Charge Transfer Mediated by Mid-Gap States: A Transient Absorption Spectroscopy Study of CdSe Quantum Dot/β-$Pb_{0.33}V_2O_5$ Heterostructures." *J. Phys. Chem. C* **2016,** *120,* 5221-5232. DOI:10.1021/acs.jpcc.6b00231
36. Chauhan, S.; Watson, D.F. "Photoinduced Electron Transfer from Quantum Dots to TiO_2: Elucidating the Involvement of Excitonic and Surface States." *Phys. Chem. Chem. Phys.* **2016,** *18,* 20466-20475. DOI:10.1039/c6cp03813a
37. Rivera-González, N.; Chauhan, S.; Watson, D.F. "Aminoalkanoic Acids as Alternatives to Mercaptoalkanoic Acids for the Linker-Assisted Attachment of Quantum Dots to TiO_2." *Langmuir* **2016,** *32,* 9206-9215. DOI:10.1021/acs.langmuir.6b02704
38. Pelcher, K.E.; Milleville, C.C.; Wangoh, L.; Cho, J.; Sheng, A.; Chauhan, S.; Sfeir, M.Y.; Piper, L.F.J.; Watson, D.F.; Banerjee, S. "Programming Interfacial Energetic Offsets and Charge Transfer in β-$Pb_{0.33}V_2O_5$/Quantum-Dot Heterostructures: Tuning Valence-Band Edges to Overlap with Midgap States." *J. Phys. Chem. C* **2016,** *120,* 28992-29001; DOI:10.1021/acs.jpcc.6b10863.
39. Huang, H.; Chauhan, S.; Gen, J.; Qin, Y.; Watson, D.F.; Lovell, J.F. "Implantable Tin Porphyrin-PEG Hydrogels with pH-Responsive Fluorescence." *Biomacromolecules* **2017,** *32,* 562-567. DOI:10.1021/acs.biomac.6b01715

Previous institutions

1. Belanger, S.; Hupp, J.T.; Stern, C.L.; Slone, R.V.; Watson, D.F.; Carrell, T.M. "Thin-Film Molecular Materials Based on Tetrametric 'Squares': Nanoscale Porosity and Size Selective Guest Transport Characteristics." *J. Am. Chem. Soc.* **1999,** *121,* 557-563. DOI:10.1021/JA9829867
2. Pfennig, B.W.; Lockard, J.V.; Cohen, J.L.; Watson, D.F.; Ho, D.M.; Bocarsly, A.B. "Synthesis, Characterization, and Photochemistry of a Dinuclear Cyanide-Bridged Iron(II)-Platinum(IV) Mixed-Valence Compound and Its Implications for the Corresponding Iron(II)-Platinum(IV)-Iron(II) Complex." *Inorg. Chem.* **1999,** *38,* 2941-2946. DOI:10.1021/IC981441A
3. Hennessy, M.H.; Soos, Z.G.; Watson, D.F.; Bocarsly, A.B. "Raman Excitation Profiles with Self-Consistent Excited-State Displacements." *J. Phys. Chem. B* **2000,** *104,* 10909-10914. DOI:10.1021/jp0011084

4. Watson, D.F.; Bocarsly, A.B. “Interfacial Photoannealing: The Light-Driven Alteration of the Surface-Binding Geometry of a Trimetallic Mixed-Valence Complex Capable of Multielectron Charge Transfer on Colloidal TiO_2.” *J. Phys. Chem. B* **2000,** *104,* 10940-10948. DOI:10.1021/jp002363r
5. Watson, D.F.; Bocarsly, A.B. “The Effects of Electronic Coupling and Solvent Broadening on the Intervalent Electron Transfer of a Centrosymmetric Mixed-Valence Complex.” *Coord. Chem. Rev.* **2001,** *211,* 177-194. DOI:10.1016/S0010-8545(00)00276-9
6. Watson, D.F.; Willson, J.T.; Bocarsly, A.B. “Photochemical Image Generation in a Cyanogel System Synthesized from Tetrachloropalladate(II) and a Trimetallic Mixed Valence Complex: A Consideration of Photochemical and Dark Mechanistic Pathways of Prussian Blue Formation.” *Inorg. Chem.* **2002,** *41,* 2408-2416. DOI:10.1021/ic010710l
7. Pfennig, B.W.; Mordas, C.J.; McCloskey, A.; Lockard, J.V.; Salmon, P.M.; Cohen, J.L.; Watson, D.F.; Bocarsly, A.B. “Excited-State Electronic Coupling and Photoinduced Multiple Electron Transfer in Two Related Ligand-Bridged Hexanuclear Mixed-Valence Compounds.” *Inorg. Chem.* **2002,** *41,* 4389-4395. DOI:10.1021/ic020232u
8. Watson, D.F.; Marton, A.; Stux, A.M.; Meyer, G.J. “Insights into Dye-Sensitization of Planar TiO_2: Evidence for Involvement of a Protonated Surface State.” *J. Phys. Chem. B* **2003,** *107,* 10971-10973. DOI:10.1021/jp035799q
9. Watson, D.F.; Tan, H.S.; Schreiber, E.; Mordas, C.J.; Bocarsly, A.B. “Femtosecond Pump-Probe Spectroscopy of Trinuclear Transition Metal Mixed-Valence Complexes.” *J. Phys. Chem. A* **2004,** *108,* 3261-3267. DOI:10.1021/jp0363038
10. Watson, D.F.; Marton, A.; Stux, A.M.; Meyer, G.J. “Influence of Surface Protonation on the Sensitization Efficiency of Porphyrin-Derivatized TiO_2.” *J. Phys. Chem. B* **2004,** *108,* 11680-11688. DOI:10.1021/jp048182x
11. Watson, D.F.; Meyer, G.J. “Cation Effects in Nanocrystalline Solar Cells.” *Coord. Chem. Rev.* **2004,** *248,* 1391-1406. DOI:10.1016/j.ccr.2004.02.015
12. Watson, D.F.; Meyer, G.J. “Electron Injection at Dye-Sensitized Semiconductor Electrodes.” *Annu. Rev. Phys. Chem.* **2005,** *56,* 119-156. DOI:10.1146/annurev.physchem.56.092503.141142
13. Hasselman, G.M.; Watson, D.F.; Stromberg, J.R.; Bocian, D.F.; Holten, D.; Lindsey, J.S.; Meyer, G.J. “Theoretical Solar-to-Electrical Energy-Conversion Efficiencies of Perylene-Porphyrin Light-Harvesting Arrays.” *J. Phys. Chem. B.* **2006,** *110,* 25430-25440. DOI:10.1021/jp064547x

Current Research Funding

1. “DMREF: Collaborative Research: A Blueprint for Photocatalytic Water Splitting: Mapping Multidimensional Compositional Space to Simultaneously Optimize Thermodynamics and Kinetics.” National Science Foundation, DMR-1626967. $554,313; 10/01/2016-09/30/2020. PI: David Watson; co-PI: Peihong Zhang.
2. “Collaborative Research: SuSChEM: The Design, Chemistry, and Study of Systems for Making Solar Hydrogen.” National Science Foundation, CHE-1566142. $433,824; 09/01/2016-08/30/2019. PI: Michael Detty; co-PI: David Watson.

Previous Funding

External:

1. "Photoinduced Charge Transfer at Quantum Dot-Molecule-Semiconductor Interfaces." National Science Foundation, CHE-1306784. $420,000; 09/01/2013-08/30/2017. PI: David Watson.
2. "Towards a Tunable Platform for Exploring Band Alignment and Mediating Efficient Charge Transfer: Combining Quantum Confinement with Mid-Gap States." Research Corporation Scialog Program. $200,000; 07/01/2013-06/30/2016. co-PIs: Sarbajit Banerjee, David Watson.
3. "Collaborative Research: The Design, Chemistry, and Study of Systems for Making Solar Hydrogen." National Science Foundation, CHE-1151379. $225,485; 04/01/2012-03/31/2016. PI: Michael Detty; co-PI: David Watson.
4. "CRIF-MU: Acquisition of an X-Ray Photoelectron Spectrometer (XPS) for Small Area and Depth Profiling." National Science Foundation, Chemistry Research Instrumentation and Facilities (CRIF) program, CHE-1048740. $450,000; 12/15/10-12/14/13. PI: Luis Colón; co-PIs: Sarbajit Banerjee, David Watson, Frank Bright, Joseph Gardella.
5. "MRI: Acquisition of an Inductively Coupled Plasma Mass Spectrometer (ICP/MS)." National Science Foundation, Major Research Instrumentation (MRI) program, CHE-0959565. $390,524; 01/01/2010-12/31/2012. PI: Diana Aga; co-PIs: Tracy Bank, David Watson, Eliza Calder, Alan Rabideau.
6. "Environmental Transport, Biodegradation, and Bioaccumulation of Quantum Dots and Oxide Nanoparticles." U.S. Environmental Protection Agency, Science to Achieve Results (STAR) Program, R833861. $400,000; 07/01/2008-06/30/2011. PI: Diana Aga; co-PIs: Sarbajit Banerjee, Luis Colón, David Watson.
7. "CAREER: Photoinduced Electron Transfer Processes in Self-Assembled Inorganic Nanomaterials." National Science Foundation, CHE-0645678. $576,100; 04/01/2007-03/31/2013. PI: David Watson.
8. "Bridge-Mediated Interparticle Electron Transfer in Self-Assembled Hybrid Semiconductor Nanomaterials." American Chemical Society Petroleum Research Fund. $35,000; 09/01/2006-08/31/2008. PI: David Watson.
9. "Metallic and Semiconducting Nanowire Arrays for the Electrical and Optical Detection of Biomolecules." James D. Watson Investigator Program, New York State Office of Science, Technology, and Academic Research (NYSTAR). $200,000; 09/01/2005-08/31/2007. PI: David Watson.

From University at Buffalo and other universities:

1. "Mizzolar: A Hub for Research and Training in Sustainable Carbon-Based Solar Energy." University of Missouri. $120,000 ($10,000 to DW at UB); 10/01/2014-09/30/2015. PI: Gary Baker, co-PIs: Luis Polo-Parada, Sheila Baker, David Watson.
2. "C.U.R.E. Contaminants – Collaborations for Understanding the Removal of Emerging Contaminants." University at Buffalo RENEW program. $36,614; 09/01/2014-08/31/2015. PI: Diana Aga, co-PIs: Ning Dai, David Watson.

3. "Optimizing Dye-sensitized Photoinduced Charge Transfer through Controlled Aggregation." Funding from University at Buffalo's Multi-Investigator Proposal Support program. $8,750; 06/01/2008-08/31/2008. PI: Michael Detty; co-PI: David Watson.
4. "Porous Anodic Alumina Templates for Nanomaterials and Devices." University at Buffalo Interdisciplinary Research and Creative Activities Fund (IRCAF). $25,000; 11/01/2004-10/31/2005. PI: Hao Zeng; co-PIs: David Watson, Surajit Sen.

Conference presentations (presenting author underlined)

University at Buffalo

1. Soja, G.R.; Dibbell, R.S.; Hoth, R.M.; Watson, D.F. "Photochemically-Directed Self-Assembly: Site-Selective Deposition of Semiconductor Quantum Dots onto TiO_2 Surfaces." American Chemical Society Northeast Regional Meeting; Binghamton, NY; October 5-7, 2006. Oral presentation, ***invited***.
2. Soja, G.R.; Dibbell, R.S.; Hoth, R.M.; Watson, D.F. "Photochemically-Directed Self-Assembly: Site-Selective Deposition of Inorganic Nanoparticles onto Metal Oxide Surfaces." 233rd American Chemical Society National Meeting; Chicago, IL; March 25-29, 2007. Oral presentation, contributed.
3. Goodrich, L.E.; Smith, A.; Nevins, J.; Dibbell, R.S.; Watson, D.F. "Synthesis, Characterization, and Photochemically-Directed Self-assembly of Au Nanoparticles." 233rd American Chemical Society National Meeting; Chicago, IL; March 25-29, 2007. Poster presentation, contributed.
4. Watson, D.F.; Dibbell, R.D.; Mann, J.R.; Soja, G.R. "Quantum Dot-Sensitized Metal Oxides: Materials Assembly and Electron Transfer Reactivity." 235th American Chemical Society National Meeting; New Orleans, LA; April 6-10, 2008. Oral presentation, contributed.
5. Soja, G.R.; Watson, D.F. "Photocatalytic Oxidative Degradation of Surfactant Monolayers on TiO_2 Films: Mechanistic and Kinetic Studies of a Novel Photopatterning Process." 235th American Chemical Society National Meeting; New Orleans, LA; April 6-10, 2008. Poster presentation, contributed.
6. Dibbell, R.S.; Watson, D.F. "Emission Quenching Studies of CdS Nanoparticles Molecularly Linked to TiO_2: Influence of Linker Length on Interfacial Electron Transfer Yield." 235th American Chemical Society National Meeting; New Orleans, LA; April 6-10, 2008. Poster presentation, contributed.
7. Soja, G.R.; Mann, J.R.; Watson, D.F. "Photocatalytic Patterning of Monolayers for the Site-Selective Adsorption of Metallic and Semiconducting Nanoparticles to Metal Oxide Surfaces." 213th Electrochemical Society Meeting; Phoenix, AZ; May 18-23, 2008. Oral presentation, ***invited***.
8. Dibbell, R.S.; Mann, J.R.; Watson, D.F. "Quantum Dot-Functionalized TiO_2 Films: Materials Assembly and Photoinduced Electron Transfer Reactivity." Gordon Research Conference: Electron Donor Acceptor Interactions; Newport, RI; August 3-8, 2008. Poster and oral presentation, contributed. ***(Poster was one of four selected by conference organizers and attendees for oral presentation.)***
9. Dibbell, R.S.; Watson, D.F.* "Time-Resolved Spectroscopic Studies of CdS Nanoparticles Molecularly Linked to TiO_2: Effect of Linker Properties on Photoinduced Electron Transfer."

236th American Chemical Society National Meeting; Philadelphia, PA; August 17-21, 2008. Oral presentation, contributed. (* Due to illness, presentation was given by D.F. Watson.)

10. Mann, J.R.; Gannon, M.K.; Fitzgibbons, T.F.; Watson, D.F.; Detty, M.R. "Aggregation of Chalcogenoxanthylium-Based Sensitizers in Dye-Sensitized Solar Cells." 236th American Chemical Society National Meeting; Philadelphia, PA; August 17-21, 2008. Oral presentation, contributed.
11. Smith, A.R.; Watson, D.F. "Direct Photoinduced Attachment of Gold Nanoparticles to Nanocrystalline Metal Oxide Thin Films. 236th American Chemical Society National Meeting; Philadelphia, PA; August 17-21, 2008. Poster presentation, contributed.
12. Soja, G.R.; Watson, D.F. "Patterned Deposition of Nanoparticles onto Surfaces through TiO_2-Catalyzed Oxidative Degradation of Mercaptoalkanoic Acid Surfactants." 236th American Chemical Society National Meeting; Philadelphia, PA; August 17-21, 2008. Oral presentation, contributed.
13. Watson, D.F.; Mann, J.R.; Soja, G.R.; Nevins, J.S. "Dimerization-Induced Dynamic Compositional Changes of Mixed Monolayers on Nanocrystalline Metal Oxide Surfaces." 236th American Chemical Society National Meeting; Philadelphia, PA; August 17-21, 2008. Oral presentation, contributed.
14. Dibbell, R.S.; Watson, D.F. "Spectroscopic Characterization of Electron Injection and Charge Recombination in Tethered Quantum Dot-Metal Oxide Assemblies." Materials Research Society Fall Meeting 2008; Boston, MA; December 1-5, 2008. Oral presentation, contributed.
15. Soja, G.R.; Watson, D.F. "Photocatalytic Oxidation of Surfactants for the Patterned Deposition of Nanoparticles onto Metal Oxide Surfaces." Materials Research Society Fall Meeting 2008; Boston, MA; December 1-5, 2008. Poster presentation, contributed.
16. Watson, D.F. "Excited-State Electron Transfer between Molecularly-Linked Inorganic Nanoparticles." 2009 National Science Foundation Workshop on Inorganic Chemistry; Park City, UT; June 15-18, 2009. Oral presentation, contributed. ***(Abstract chosen in competitive process with formal review.)***
17. Smith, A.R.; Watson, D.F. "Photochemically Triggered Assembly of Composite Nanomaterials through the Photodimerization of Adsorbed Anthracene Derivatives." American Vacuum Society Hudson Mohawk Chapter Fall Meeting 2009; Albany, NY; October 13, 2009. Oral presentation, contributed.
18. Nevins, J.S.; Coughlin, K.M.; Watson, D.F. "Influence of Aqueous Quantum Dots' Surfactant Structure on Attachment to Nanocrystalline TiO_2 Films." American Vacuum Society Hudson Mohawk Chapter Fall Meeting 2009; Albany, NY; October 13, 2009. Oral presentation, contributed.
19. Smith, A.R.; Watson, D.F. "Photochemically Triggered Assembly of Composite Nanomaterials through the Photodimerization of Adsorbed Anthracene Derivatives." 37th Ontario-Québec Physical Organic Mini-Symposium; Buffalo, NY; November 13-15, 2009. Oral presentation, contributed.
20. Mulhern, K.R.; Smith, A.R.; Calitree, B.D.; Gannon, M.K.; Fitzgibbons, T.C.; Onyeji, J.C.; Detty, M.R.; Watson, D.F. "Optimizing the Photocurrent Efficiency of Dye-Sensitized Solar Cells

through the Controlled Aggregation of Chalcogenorhodamine Dyes." 37th Ontario-Québec Physical Organic Mini-Symposium; Buffalo, NY; November 13-15, 2009. Poster presentation, contributed.

21. Smith, A.R.; Watson, D.F. "Photochemically Triggered Assembly of Composite Nanomaterials through the Photodimerization of Adsorbed Anthracene Derivatives." Materials Research Society Fall Meeting 2009; Boston, MA; November 30 to December 4, 2009. Oral presentation, contributed.
22. Mann, J.R.; Smith, A.R.; Calitree, B.D.; Gannon, M.K.; Fitzgibbons, T.C.; Onyeji, J.C.; Detty, M.R.; Watson, D.F. "Optimizing the Photocurrent Efficiency of Dye-Sensitized Solar Cells through the Controlled Aggregation of Chalcogenoxanthylium Dyes on Nanocrystalline TiO_2 Films." Materials Research Society Fall Meeting 2009; Boston, MA; November 30 to December 4, 2009. Oral presentation, contributed.
23. Dibbell, R.D.; Youker, D.G.; Coughlin, K.M.; Watson, D.F. "Spectroscopic Characterization of Bridge-Mediated Electron Transfer Processes in Tethered Quantum Dot-Metal Oxide Assemblies." Materials Research Society Fall Meeting 2009; Boston, MA; November 30 to December 4, 2009. Poster presentation, contributed.
24. Nevins, J.S.; Watson, D.F. "Adsorption of Aqueous Quantum Dots to Nanocrystalline TiO_2 Thin Films: Influence of Surfactant Structure on Surface Coverage and Electron Injection Efficiency." Materials Research Society Fall Meeting 2009; Boston, MA; November 30 to December 4, 2009. Poster presentation, contributed.
25. Lee, D.; Nevins, J.S.; Watson, D.F.; Cartwright, A.N.; Prasad, P.N. "Tuning of Absorbance Spectra in CdS/CdSe Quantum Dot Co-Sensitized Solar Cells." Materials Research Society Fall Meeting 2009; Boston, MA; November 30 to December 4, 2009. Poster presentation, contributed.
26. Navarro, D.A.G.; Depner, S.W.; Coughlin, K.M.; Youker, D.G.; Watson, D.F.; Aga, D.S.; Banerjee, S. "Interactions of Natural Organic Matter with Engineered Nanocrystals." Materials Research Society Fall Meeting 2009; Boston, MA; November 30 to December 4, 2009. Oral presentation, contributed.
27. Navarro, D.A.G.; Aga, D.S.; Banerjee, S.; Watson, D.F. "Interactions of Natural Organic Matter with Manufactured Nanocrystals." American Chemical Society Northeast Regional Meeting; Potsdam, NY; June 2-5, 2010. Oral presentation, contributed.
28. Navarro, D. A. G.; Watson, D. F.; Banerjee, S.; Aga, D. S. "Role of Natural Organic Matter on the Fate and Transport Behavior of Quantum Dot Nanoparticles in the Aquatic and Soil Environment." American Chemical Society Northeast Regional Meeting; Potsdam, NY; June 2-5, 2010. Oral presentation, contributed.
29. Navarro, D.A.G.; Aga, D.S.; Banerjee, S.; Watson, D.F. "Mechanisms of Interaction between Humic Acid and Hydrophobic CdSe Quantum Dots Facilitating the Partitioning into Aqueous Phase." 240th American Chemical Society National Meeting; Boston, MA; August 22-26, 2010. Oral presentation, contributed.
30. Dibbell, R.S.; Nevins, J.S.; Youker, D.G.; Coughlin, K.M.; Watson, D.F. "Electron Transfer at Quantum Dot-TiO_2 Interfaces Prepared by Linker-Assisted Assembly." 240th American

Chemical Society National Meeting; Boston, MA; August 22-26, 2010. Oral presentation, ***invited***.

31. Watson, D.F. "Nanostructured Materials with Potential Applications in 2nd and 3rd Generation Photovoltaic Devices." Buffalo Business of Energy Workshop: Photovoltaics – Silicon and Beyond; Amherst, NY; September 15, 2010. Oral presentation, ***invited***.
32. Sennett, M.; Watson, D.F. "Linker-Assisted Attachment of Quantum Dots to TiO_2 through a "One Pot" *In-situ* Method and Using a Novel Bifunctional Organic Linker Molecule." 241st American Chemical Society National Meeting; Anaheim, CA; March 27-31, 2011. Poster presentation, contributed.
33. Navarro, D.A.G.; Aga, D.S.; Banerjee, S.B.; Watson, D.F. "Studies on the Chemical Fate and Transport Behavior of Water-Woluble CdSe and CdSe/ZnS Quantum Dots in the Soil Environment." 241st American Chemical Society National Meeting; Anaheim, CA; March 27-31, 2011. Oral presentation, contributed.
34. Baker, J.S.; Nevins, J.S.; Coughlin, K.M.; Watson, D.F.; Colón, L.A. "Spectroscopic and Electrophoretic Analysis of the Temporal Stability of Cysteine-Capped CdSe Nanoparticles." Pittcon 2011; Atlanta, GA; March 13-18, 2011. Oral presentation, contributed.
35. Nevins, J.S.; Coughlin, K.M.; Watson, D.F. "Effects of Surfactants on the Growth Kinetics of Aqueous CdSe Quantum Dots (QDs) and Electron Injection from QDs into TiO_2." Surface Analysis 2011, 33rd Symposium on Applied Surface Analysis; Albany, NY; April 11-13, 2011. Poster presentation, contributed.
36. Kern, M.; Watson, D.F. "Van der Waals-Induced Compositional Changes of Mixed Monolayers." Surface Analysis 2011, 33rd Symposium on Applied Surface Analysis; Albany, NY; April 11-13, 2011. Poster presentation, contributed.
37. Youker, D.G.; Watson, D.F. "Influence of Excitation Energy on Interfacial Electron Transfer in Tethered Assemblies of CdSe Quantum Dots and TiO_2 Nanoparticles." Materials Research Society Spring Meeting 2011; San Francisco, CA; April 25-29, 2011. Poster presentation, contributed.
38. Mulhern, K.R.; Detty, M.R.; Watson, D.F. "Aggregation-Induced Increases of the Efficiency of Electron Injection from Chalcogenorhodamine Dyes to TiO_2." Materials Research Society Spring Meeting 2011; San Francisco, CA; April 25-29, 2011. Poster presentation, contributed.
39. Nevins, J.S.; Coughlin, K.M.; Watson, D.F. "Analysis of the Growth Kinetics of Aqueous CdSe Quantum Dots (QDs) and the Assembly and Electron-Transfer Reactivity of Nanostructured QD-TiO_2 Interfaces." Materials Research Society Spring Meeting 2011; San Francisco, CA; April 25-29, 2011. Poster presentation, contributed.
40. Coughlin, K.M.; Nevins, J.S.; Watson, D.F. "Investigation of Growth Kinetics of Aqueous Cadmium Chalcogenide Quantum Dots and Their Photoinduced Electron-Injection Efficiency to Titanium Dioxide." Materials Research Society Spring Meeting 2011; San Francisco, CA; April 25-29, 2011. Oral presentation, contributed.
41. Ventura, R.S.; Nevins, J.S.; Youker, D.G.; Coughlin, K.M.; Watson, D.F. "Linker-Assisted Assembly and Interfacial Electron-Transfer Reactivity of Quantum Dot-TiO_2 Architectures."

Materials Research Society Spring Meeting 2011; San Francisco, CA; April 25-29, 2011. Oral presentation, contributed.

42. Mulhern, K.R.; Detty, M.R.; Watson, D.F. "Aggregation-Induced Increase of the Light Harvesting Efficiency and Quantum Yield of Electron Injection of Chalcogenoxanthylium Dyes on TiO_2." Materials Research Society Fall Meeting 2011; Boston, MA; November 28 to December 2, 2011. Poster presentation, contributed.
43. Coughlin, K.M.; Nevins, J.S.; Watson, D.F. "Aqueous Cadmium Chalcogenide Quantum Dots: Factors Influencing their Structural and Electronic Properties, and their Photoinduced Electron-Injection Efficiency to Titanium Dioxide." Materials Research Society Fall Meeting 2011; Boston, MA; November 28 to December 2, 2011. Oral presentation, contributed.
44. Kern, M.E.; Watson, D.F. "Effect of Chain Length and Solution Composition on Dispersion Interactions within Mixed Monolayers on Nanocrystalline TiO_2." Materials Research Society Fall Meeting 2011; Boston, MA; November 28 to December 2, 2011. Poster presentation, contributed.
45. Mulhern, K.R.; Orchard, A.; Detty, M.R.; Watson, D.F. "Influence of Surface-Attachment Functionality and Aggregation State on the Electron-Transfer Reactivity of Chalcogenorhodamine Dyes on TiO_2." American Chemical Society Northeast Regional Meeting; Rochester, NY; September 30 to October 3, 2012. Oral presentation, contributed.
46. Kern, M.E.; Watson, D.F. "Influence of Quality and Morphology of QD-Linker-TiO_2 Interfaces on Photoelectrochemical Performance of Quantum Dot-Sensitized Solar Cells." Gordon Research Conference: Electron Donor Acceptor Interactions; Newport, RI; August 6-10, 2012. Poster presentation, contributed.
47. Mulhern, K.R.; Watson, D.F. "Spectroscopic and Photoelectrochemical Studies of Chalcogenorhodamine Dyes for Applications in Dye-Sensitized Solar Cells." Gordon Research Conference: Electron Donor Acceptor Interactions; Newport, RI; August 6-10, 2012. Poster presentation, contributed.
48. Kern, M.E.; Watson, D.F. "Linker-Assisted Assembly: Effect of Solvation and Persistence of Adsorbed Linkers on the Attachment of CdSe Quantum Dots to TiO_2." American Chemical Society Northeast Regional Meeting; Rochester, NY; October 1-3, 2012. Oral presentation, contributed.
49. Mulhern, K.R.; Watson, D.F. "Spectroscopic and Photoelectrochemical Studies of Chalcogenorhodamine Dyes for Applications in Dye-Sensitized Solar Cells." American Chemical Society Northeast Regional Meeting; Rochester, NY; October 1-3, 2012. Oral presentation, contributed.
50. Banerjee, S.; Watson, D.F. "Interfaces Combining Intercalative States and Quantum Confinement." 2013 Scialog Conference, Tucson, AZ; October 15-18, 2013. Oral presentation, ***invited***.
51. Milleville, C.C.; Pelcher, K.E.; Banerjee, S.; Watson, D.F. "Interfaces Combining Intercalative States and Quantum Confinement." 2013 Scialog Conference, Tucson, AZ; October 15-18, 2013. Poster presentation, ***invited***.
52. Milleville, C.C.; Pelcher, K.E.; Banerjee, S.B.; Watson, D.F. "Quantum Dot-Functionalized β-$Pb_xV_2O_5$ Nanowires: Interfaces Combining Intercalative Mid-Gap States and Quantum

Confinement." 2014 Gordon Research Conference: Colloidal Semiconductor Nanocrystals, Smithfield, RI; July 20-25, 2014. Poster presentation, contributed; D.W. invited discussion leader.

53. Nasca, J.N.; Kern, M.E.; Ventura, R.S.; Watson, D.F. "Assembly and Electron-Transfer Reactivity of Quantum Dot-Molecule-Semiconductor Interfaces: Influence of Interfacial Morphology, Distance, and Electronic Coupling on Charge Transfer." 2014 Gordon Research Conference: Colloidal Semiconductor Nanocrystals, Smithfield, RI; July 20-25, 2014. Poster presentation, contributed; D.W. invited discussion leader.
54. Banerjee, S.; Watson, D.F. "Integrating β-$Pb_{0.33}V_2O_5$ Nanowires with CdSe Quantum Dots: Towards Nanoscale Heterostructures with Tunable Interfacial Energetic Offsets." 2014 Scialog Conference, Tucson, AZ; October 14-17, 2014. Poster presentation, ***invited***.
55. Sellers, D.G.; Button, A.A.; Watson, D.F. "Excited-State Charge Transfer within Quantum Dot-Molecule-Quantum Dot Assemblies Prepared by Carbodiimide Coupling Chemistry." Materials Research Society Spring Meeting 2015; San Francisco, CA; April 6-10, 2015. Oral presentation, contributed.
56. Pelcher, K.E.; Milleville, C.C.; Wangoh, L.; Crawley, M.R.; Marley, P.M.; Piper, L.F.J.; Banerjee, S.; Watson, D.F. "Integrating β-$Pb_{0.33}V_2O_5$ Nanowires with CdSe Quantum Dots: Towards Nanoscale Heterostructures with Tunable Interfacial Energetic Offsets." Materials Research Society Spring Meeting 2015; San Francisco, CA; April 6-10, 2015. Oral presentation, contributed.
57. Sellers, D.G.; Chauhan, S.; Watson, D.F. "Probing the Energetic Distribution of Electrons Transferred from Photoexcited CdSe Quantum Dots to Molecularly-Tethered TiO_2 Nanoparticles." Materials Research Society Spring Meeting 2015; San Francisco, CA; April 6-10, 2015. Oral presentation, contributed.
58. Milleville, C.C.; Pelcher, K.E.; Banerjee, S.; Watson, D.F. "Integrating β-$Pb_xV_2O_5$ Nanowires with CdSe Quantum Dots: Toward Nanoscale Heterostructures with Tunable Interfacial Energetic Offsets for Charge Transfer." Materials Research Society Fall Meeting 2015; Boston, MA; November 29 through December 4, 2015. Oral presentation, contributed.
59. Chauhan, S.; Watson, D.F. "Probing the Energetic Distribution of Electrons Transferred from Photoexcited CdSe Quantum Dots to Molecularly-Tethered TiO_2 Nanoparticles." Materials Research Society Fall Meeting 2015; Boston, MA; November 29 through December 4, 2015. Poster presentation, contributed.
60. Liwosz, K.R.; Detty, M.R.; Watson, D.F. "Electron Injection and Charge Recombination at Chalcogenorhodamine-TiO_2 Interfaces." Materials Research Society Fall Meeting 2015; Boston, MA; November 29 through December 4, 2015. Oral presentation, contributed.
61. Awad, M.J.; Watson, D.F. "Excited-State Electron Transfer from CdSe Quantum Dots to TiO_2: Influence of the Properties of Molecular Linkers on Electron Transfer within Mesoporous Films." 251st American Chemical Society National Meeting; San Diego, CA; March 13-17, 2016. Poster presentation, contributed.
62. Rivera-González, N.; Watson, D.F. "Photoinduced electron transfer at QD-molecule-TiO_2 interfaces prepared by linker-assisted assembly: Influence of QD-anchoring chemistry on materials assembly and excited-state electron transfer." Gordon Research Conference:

Colloidal Semiconductor Nanocrystals; Mount Snow, VT; July 31 – August 5, 2016. Poster presentation, contributed.

63. Nasca, J.N.; Watson, D.F. "Photoinduced charge transfer within Covalently Linked Quantum Dot Heterostructures." Gordon Research Conference: Colloidal Semiconductor Nanocrystals; Mount Snow, VT; July 31 – August 5, 2016. Poster presentation, contributed.
64. Chauhan, S.; Watson, D.F. "Photoinduced Electron Transfer from CdSe and Core/Shell CdSe/ZnS Quantum Dots to TiO_2: Elucidating and Minimizing the Involvement of Trap States." Gordon Research Conference: Colloidal Semiconductor Nanocrystals; Mount Snow, VT; July 31 – August 5, 2016. Poster presentation, contributed.
65. Watson, D.F. "Excited-State Electron Transfer in Quantum Dot Heterostructures." Gordon Research Conference: Colloidal Semiconductor Nanocrystals; Mount Snow, VT; July 31 – August 5, 2016. Oral presentation, ***invited***.
66. Watson, D.F. "Excited-State Electron Transfer in Quantum Dot Heterostructures." New York American Physical Society Meeting; Buffalo, NY; April 21 – 22, 2017. Oral presentation, ***invited***.

Previous institutions

1. Watson, D.F.; Bocarsly, A.B. "Pump-Probe Spectroscopy of Trimetallic Mixed-Valence Complexes: Solvent Dependence of Back Electron Transfer Lifetime." V^{th} Femtochemistry Conference; Toledo, Spain; September 2-6, 2001. Poster presentation, contributed.
2. Watson, D.F.; Marton, A.; Stux, A.M.; Meyer, G.J. "Reorganization Energy of Excited State Electron Injection through Multiple Semiconductor-Sensitizer Linkages." 14th Inter-American Photochemical Society Winter Conference; Clearwater, FL; January 2-5, 2003. Poster presentation, contributed.

Invited lectures at universities and colleges

Presentations to departments of chemistry, unless otherwise noted.

1. SUNY Fredonia, October 2004
2. Canisius College, September 2005
3. SUNY Geneseo, September 2005
4. University at Buffalo, Dept. of Electrical Engineering, January 2006
5. Buffalo State College, November 2006
6. Amherst College, November 2006
7. University at Buffalo, Dept. of Chemical Engineering, November 2006
8. Ursinus College, April 2007
9. Union College, October 2007
10. Youngstown State University, February 2008
11. University of Rochester, September 2008
12. Princeton University, October 2008
13. Emory University, October 2008
14. Georgia Institute of Technology, October 2008
15. University of Georgia, October 2008
16. Johns Hopkins University, October 2008
17. SUNY Brockport, November 2008

18. Haverford College, January 2009
19. Drexel University, Dept. of Materials Science and Engineering, January 2009
20. Bowling Green University, February 2009
21. Cornell University, March 2009
22. University at Buffalo, September 2009
23. Canisius College, January 2010
24. Indiana University of Pennsylvania, February 2010
25. Hartwick College, February 2011
26. Elmira College, October 2011
27. SUNY Fredonia, October 2011
28. Alfred University, October 2012
29. Brock University, November 2012
30. Rensselaer Polytechnic Institute, February 2013
31. Niagara University, October 2013
32. Rochester Institute of Technology, February 2014
33. Niagara University, September 2014
34. University of Missouri, March 2015
35. SUNY Potsdam, March 2015
36. St. Lawrence University, March 2015
37. Niagara University, April 2015
38. Duquesne University, February 2017

Professional Service

1. Symposium co-organizer: "Recent Advances in Inorganic Materials." American Chemical Society Northeast Regional Meeting; Binghamton, New York; October 5-7, 2006.
2. Manuscript reviewer for the following journals: *ACS Applied Materials and Interfaces, ACS Energy Letters, ACS Nano, Advanced Functional Materials, Analytical Chemistry, Applied Spectroscopy, Applied Surface Science, Chemical Communications, Chemical Engineering Journal, Chemistry Letters, Chemistry of Materials, Chemical Reviews, Chemical Society Reviews, Electrochemical and Solid-State Letters, Energy and Environmental Science, Environmental Science and Technology, European Journal of Chemistry, Inorganic Chemistry, Journal of the American Chemical Society, Journal of Applied Physics, Journal of Coordination Chemistry, Journal of Hazardous Materials, Journal of Materials Chemistry, Journal of Materials Science, Journal of Molecular Structure, Journal of Nanomaterials, Journal of Nanophotonics, Journal of Photochemistry and Photobiology, Journal of Physical Chemistry, Journal of Physical Chemistry Letters, Journal of Physics D: Applied Physics, Langmuir, Laser and Photonics Reviews, Materials Science and Engineering B, Materials Research Society Proceedings, Nano Letters, Nanoscale, Nanoscale Horizons, Nanotechnology, New Journal of Chemistry, Photochemical and Photobiological Sciences, Physical Chemistry Chemical Physics, Polymer Chemistry, Research in Chemical Intermediates, RSC Advances, Sensors and Actuators B, Small, Spectroscopy Letters, Thin Solid Films.*
3. Proposal reviewer for the following funding agencies: Department of Energy, National Science Foundation, American Chemical Society Petroleum Research Fund, International

Union of Pure and Applied Chemistry, Research Corporation for Science Advancement, U.S. Civilian Research Development Foundation.
4. Review panelist for National Science Foundation (2012, 2014, 2015, 2016).
5. Member of editorial board of *Journal of Coordination Chemistry* (2011 – present).

University Service

University level

1. Member of organizing committee for Integrated Nanostructured Systems Symposium: "Multifunctional Nanomaterials and Nanodevices." University at Buffalo; May 18-19, 2007.
2. Member of one review panel for UB 2020 Scholars Fund.
3. Member of two review panels for Interdisciplinary Research Development Fund (IRDF).
4. Member of one review panel for UB IMPACT.
5. Member of committee to review the University at Buffalo's Chemical Hygiene Plan (2012-2013).
6. Member of College of Arts and Sciences Creative Activities and Research Subcommittee of the CAS@20 Strategic Planning Committee (2013).
7. Member of College of Arts and Sciences and School of Engineering and Applied Sciences Faculty Advisory Committee on shared instrumentation (2014-2016).

Departmental committees and service roles

2004-2015	Graduate recruitment committee (Chair 2010-2015)
2005-2011	Colloquium committee
2005	Chair selection advisory committee
2005	Materials chemistry / polymer science faculty search committee
2006-2010, 2012-	Graduate admissions committee
2006	Nanomaterials faculty search committee
2010	Ad hoc committee to evaluate teaching efficiency
2011-2015	Convener, Inorganic division of faculty
2011-	Executive committee
2012-2016	Associate Director of Graduate Studies
2012	Materials chemistry faculty search committee (Chair)
2012-2016	Graduate curriculum, advisement, and petitions committee
2012-2016	Space committee
2013	Inorganic faculty search committee (Associate Chair)
2014	Organic/inorganic faculty search committee
2015	Ad hoc committee to define implementation of Chair-Elect
2015	Honors and awards committee
2016	Chair-Designate of Department of Chemistry
2016-	Chair of Department of Chemistry

Community Service / Outreach Activities

1. Director of *Internships in Nanomaterials Research (INR)* (2007-2011) and *Interdisciplinary Science and Engineering Partnership Summer Research Internships (ISEP-SRI)* (2014-2015), which are NSF-funded summer research internship programs for high school students from Buffalo Public Schools. Interns performed research in the Departments of Chemistry, Physics, Chemical Engineering, and Electrical Engineering. Interns also participate in seminar

series to discuss fundamental concepts in chemistry and nanomaterials science, to meet with various faculty and discuss their research areas, and to discuss scientific writing and develop writing skills. In 2007-2011 (INR) and 2014-2015 (ISEP-SRI), the program supported 28 high school students (14 female, 14 African American, 2 Latina/o) and 29 graduate student mentors.

2. Faculty participant in UB-Buffalo Public Schools (UB-BPS) Partnership science outreach program involving Buffalo middle and high school students (Fall 2006 – present). Developed and led demonstrations and hands-on laboratory exercises for middle school students and parents, organized visits to UB laboratories, and worked with science teachers to develop laboratory experiments and corresponding curricula.
3. Member of the Executive Committee of the NSF-supported UB-BPS Interdisciplinary Science and Engineering Partnership (2012 – present).
4. Faculty participant in *Science Exploration Day* (2007-2016) at UB, in which high school students from Western New York tour campus research facilities.
5. Invited speaker: American Chemical Society Western New York Section's Education Night. May 5, 2006.
6. Faculty participant in *Western New York Science and Technology Forum* (December 2006, November 2012). Presented general-audience lectures on nanoscience and solar energy conversion.
7. Participant in ACS PFLAGS Seminar (May 2007). Led a discussion of academic careers at research universities.
8. Invited speaker: Buffalo Business of Energy Workshop: Photovoltaics – Silicon and Beyond. September 15, 2010.
9. Invited speaker: UB This Summer lecture series (July 2013). Presented general-audience lecture on the role of nanomaterials in solar energy conversion.

Courses taught

2004-	CHE 101, 102, 321, 322, 503, 504, 510. Courses taught per semester as follows:
Fall 2004	CHE 503, Inorganic Chemistry (graduate-level; symmetry and group theory, coordination chemistry, descriptive chemistry of the transition metals, organometallic chemistry, bioinorganic chemistry)
Fall 2005	CHE 503, Inorganic Chemistry
Spring 2006	CHE 102, General Chemistry
Fall 2006	CHE 503, Inorganic Chemistry
Spring 2007	CHE 504, Physical Methods in Inorganic Chemistry (co-taught, 50%: electronic and vibrational spectroscopies) CHE 322, Advanced Inorganic Chemistry Laboratory (co-taught, 50%)
Fall 2007	CHE 503, Inorganic Chemistry (co-taught, 50%)
Spring 2008	CHE 102, General Chemistry CHE 510, Inorganic Materials Chemistry (co-taught, 50%: solid-state structure, electronic and optical properties of materials)
Spring 2009	CHE 504, Physical Methods in Inorganic Chemistry (co-taught, 50%) CHE 510, Inorganic Materials Chemistry (co-taught, 50%)
Fall 2009	CHE 102, General Chemistry

Spring 2010	CHE 322, Advanced Inorganic Chemistry Laboratory
Fall 2010	CHE 102, General Chemistry
Spring 2011	CHE 322, Advanced Inorganic Chemistry Laboratory (co-taught, 50%) CHE 510, Inorganic Materials Chemistry (co-taught, 50%)
Fall 2011	CHE 101, General Chemistry
Spring 2012	CHE 322, Advanced Inorganic Chemistry Laboratory
Fall 2012	CHE 503, Inorganic Chemistry
Spring 2013	CHE 322, Advanced Inorganic Chemistry Laboratory (co-taught, 50%) CHE 510, Inorganic Materials Chemistry (co-taught, 50%)
Fall 2013	CHE 503, Inorganic Chemistry
Spring 2014	CHE 322, Advanced Inorganic Chemistry Laboratory
Fall 2014	CHE 321, Inorganic Chemistry (undergraduate-level; atomic structure, periodic properties, symmetry and group theory, molecular orbital theory, coordination chemistry, organometallic chemistry)
Spring 2015	CHE 322, Advanced Inorganic Chemistry Laboratory (co-taught, 50%) CHE 510, Inorganic Materials Chemistry (co-taught, 50%)
Fall 2015	CHE 321, Inorganic Chemistry

Student advisement

Research group

Graduated Ph.D. students (10):

Gregory Soja; Ph.D. dissertation: *Patterning Applications via Photochemical and Intermolecular Reactions within Monolayers on Metal Oxide Films*; defended 12/2008

Rachel Dibbell; Ph.D. dissertation: *Fundamental Studies of the Surface Chemistry and Photoinduced Charge Transfer Reactivity of Tethered Semiconductor Nanoassemblies*; defended 05/2009

Anthony Smith ; Ph.D. dissertation: *Photopatterning and Solar Energy Conversion Using Nanocrystalline Metal Oxide Films*; defended 09/2010

Jeremy Nevins; Ph.D. dissertation: *Surface Chemistry of Nanostructures: 1) Interactions of Mixed Monolayers of Carboxylic Acids on Titania, 2) Synthesis and Immobilization of Aqueous Cadmium Selenide Quantum Dots*; defended 08/2011

Kathleen Coughlin; Ph.D. dissertation: *Aqueous Cadmium Chalcogenide Quantum Dots: Synthesis, Characterization, Spectroscopic Investigation of Electron Transfer Properties, and Photovoltaic Device Performance*; defended 11/2012

Diane Youker; Ph.D. dissertation: *Fundamental Studies of Interfacial Excited-State Charge Transfer in Molecularly Tethered Semiconductor Nanoassemblies*; defended 12/2012

Kacie Mulhern; Ph.D. dissertation: *Spectroscopic and Photoelectrochemical Studies of Metal-Free Dyes for Dye-Sensitized Solar Cells*; defended 07/2013

Meghan Kern; Ph.D. dissertation: *Investigations of the Surface Functionalization of Titania: Dispersion-Induced Effects within Mixed Monolayers, Linker-Assisted Assembly of Quantum Dots, and Photovoltaic Device Performance*; defended 08/2013

Christopher Milleville; Ph.D. dissertation: *CdSe/β-$Pb_{0.33}V_2O_5$ Heterostructures: Nanoscale Semiconductor Interfaces with Tunable Energetic Configurations for Solar Energy Conversion and Storage*; defended 05/2016

Justin Nasca; Ph.D. dissertation: *Spectroscopic Analysis of Covalently Tethered Quantum Dot Systems and Chalcogenorhodamine Dyes on TiO_2: Probing Electron Transfer Processes*; defended 08/2017

Graduated masters students (5):

Ruth Hoth (M.S., 2006)
Tzuchuan Cheng (M.A., 2007)
Scott Martin (M.A., 2008)
Ian Anderson (M.A., 2013)
Amanda Button (M.A., 2014)

Postdoctoral associate:

Jonathan Mann (advised 03/2007-05/2008)

Current graduate students (7):

Saurabh Chauhan (Ph.D. anticipated 2018)
Zachery Schmidt (Ph.D. anticipated 2018)
Natalia Rivera-González (Ph.D. anticipated 2019)
Guy Wolfe II (Ph.D. anticipated 2019)
Aaron Sheng (Ph.D. anticipated 2020)
Caitlin McGranahan (Ph.D. anticipated 2021)
Nuwanthi Suwandaratne (Ph.D. anticipated 2021)

Current undergraduate students (2):

Lauren Thompson (B.S. anticipated 2018)

Previous undergraduate students (30):

Jeremy Nevins, Siena College (REU student, summer 2005)
Lauren Goodrich, University of Minnesota (REU student, summer 2006)
Stephen Slocum (B.S. 2006)
Patrick Wieder (B.A. 2006)
Austin Faulkner (B.A. 2007)
Jonathan Barone (B.A. 2008)
Kevin Cook (B.S. 2008)
David Marsh (B.S. 2008)
Thomas Fitzgibbons (B.S. 2009)
Seth Levy (B.S. 2010)
Sylvester Owusu-Ansah (B.A. 2010)
Alex Strait (B.A. 2010)
Kasey Schultz (B.A. 2011)
Michael Sennett, Canisius College (REU student, summer 2010; B.A. 2011)
Nabeel Minhas (B.A. 2014)
Patrick Medlock-Turek (B.A. 2012)
Natalia Rivera-González, UPR-Cayey (REU student, summer 2013)
Jonathan Sandberg (B.S. 2014)

Connor Arquette (B.S. 2015)
Maria Rivera Albarran, UPR-Cayey (REU student, summer 2014)
Rebecca Schmitt (B.S. 2017)
Lauren Vangelder (B.S. 2015)
Christopher Jay (B.A. 2015)
Edward Porock (B.S. 2015)
Rachel Hutchinson, Roberts Wesleyan University (REU student, summer 2015)
Daniel Bulmahn (B.S. 2016)
Jennifer Empey (B.S. 2016)
Caitlin McGranahan (B.S. 2016)
Alejandro Falca (B.S. 2017)
Maoj Awad (REU student, summer 2015; B.S. 2017)

Previous high school students (7):

Justin Onyeji (City Honors School, BPS; summers 2007, 2008)
Alenah Robbins (East High School, BPS; summer 2008)
Terasa Hall (East High School, BPS; summer 2009)
Cedric Ortiz (Math, Science, and Technology Prep. School at Seneca, BPS; summer 2010)
Rebecca Schmitt (West Seneca East High School; summer 2011)
Tyrone Green (Bennett High School; summer 2014)
Patrick Nguyen (Hutchinson Central Technical High School; summer 2015)

Departmental advisement

Research advisor in departmental REU program (2005, 2006, 2010, 2013, 2014, 2015)
Member of Ph.D. committees of 109 graduate students.

Collaborators within last 48 months

Sarbajit Banerjee (Texas A&M Univ.), Michael Detty (UB), Richard Eisenberg (Univ. of Rochester), David McCamant (Univ. of Rochester), Diana Aga (UB), Ning Dai (UB), Luis Colón (UB), Gary Baker (Univ. of Missouri), Luis Velarde (UB), Joseph Gardella (UB), Philip Coppens (UB), Louis Piper (SUNY Binghamton), Peihong Zhang (UB), Shengbai Zhang (Rensselaer Polytechnic Institute), Hao Zeng (University at Buffalo)

Awards

2015	College of Arts and Sciences Teaching Award, University at Buffalo
2013	Scialog Award, Research Corporation for Science Advancement
2011-2012	Milton Plesur Award for Excellence in Teaching, UB Undergraduate Student Association
2007	National Science Foundation CAREER Award
2005	James D. Watson Investigator Award, New York State Office of Science, Technology, and Academic Research (NYSTAR)
2000	International Precious Metals Institute Graduate Student Award
1996-1997	L. Carroll King Award for A-Level Teaching, Northwestern University
1996	American Institute of Chemists Student Award
1996	Lyman Beecher Hall Prize in Chemistry, Haverford College

Memberships

1998- American Chemical Society, Division of Inorganic Chemistry
2008- Materials Research Society
2011- Editorial Board of the *Journal of Coordination Chemistry*