

## Emily A. Weiss

Department of Chemistry, Northwestern University  
2145 Sheridan Rd. Evanston, IL, 60208-3113  
Phone: 847-491-3095  
Fax: 847-491-7713  
e-weiss@northwestern.edu  
<http://sites.weinberg.northwestern.edu/weiss-lab/>

### EDUCATION

Northwestern University, Evanston, IL, Ph.D. Chemistry June 2005  
Princeton University, Princeton, NJ, A.B. (honors) Chemistry May 2000

### PROFESSIONAL EXPERIENCE

**Associate Professor**, *Department of Chemistry, Northwestern University* 2013-present  
**Irving M. Klotz Research Professor**, *Northwestern University* 2012-present  
    **Co-PI**, Center for Bio-Inspired Energy Science 2014 – present  
    **Co-PI**, Argonne-Northwestern Solar Energy Research Center 2012 – present  
    **Co-PI**, Non-equilibrium Research Center 2009-2014  
    **Co-PI**, Materials Research Science and Engineering Center 2009 - present  
**Clare Boothe Luce Assistant Professor** 2008 - 2013  
    *Department of Chemistry, Northwestern University*  
**Postdoctoral Research Fellow** 2005-2008  
    *Department of Chemistry and Chemical Biology, Harvard University*  
    Advisor: George M. Whitesides  
**Graduate Research Fellow** 2000-2005  
    *Department of Chemistry, Northwestern University*  
    Advisors: Michael R. Wasielewski, Mark A. Ratner  
**Undergraduate Researcher** 1998-2000  
    *Department of Chemistry, Princeton University, Advisor: Herschel Rabitz*

### HONORS and AWARDS

18. Harry B. Gray Award for Creative Work in Inorganic Chemistry by a Young Investigator 2015  
17. Camille Dreyfus Teacher-Scholar Award, The Dreyfus Foundation 2014  
16. Kavli Emerging Leader in Chemistry, American Chemical Society 2014  
15. Distinguished Teaching Award, Northwestern Undergraduate Chemistry Council 2013  
14. Kavli Fellow of the National Academy of Sciences 2011  
13. NU-Argonne Early Career Investigator Award for Energy Research 2011  
12. A.P. Sloan Foundation Research Fellowship 2011  
11. Packard Fellowship for Science and Engineering 2010  
10. Presidential Early Career Award for Scientists and Engineers (PECASE) via the ARO 2010  
9. Department of Energy Early Career Research Award 2010  
8. Dreyfus Foundation Postdoctoral Program in Environmental Chemistry Award 2009  
7. Air Force Office of Scientific Research Young Investigator Award 2009  
6. Dreyfus Foundation New Faculty Award 2008  
5. Dow Chemical Company Teacher-Scholar Award 2008  
4. ACS Petroleum Research Fund Postdoctoral Energy Fellowship 2005  
3. Northwestern University Graduate Presidential Fellowship 2004  
2. The Link Foundation Doctoral Energy Fellowship 2002  
1. Northwestern Award for Teaching Excellence: Quantum Chemistry 2002

## ADVISORY BOARDS

4. Editorial Advisory Board, *Materials Horizons*, 2014 – present
3. Editorial Advisory Board, *ACS Nano*, 2014 - present
2. Editorial Advisory Board, *RSC Advances*, 2014 - present
1. Scientific Advisory Board, US Nano (<http://usnanollc.com/>), 2013 - present

## PUBLICATIONS (All co-authors are students or postdocs, *except* those in **bold** case.)

87. Amin, V.A.; Aruda, K.O.; Lau, B.; Edme, K.; Rasmussen, A.M.; **Weiss, E.A.** The Dependence of the Bandgap of CdSe Quantum Dots on the Surface Coverage and Binding Mode of an Exciton-Delocalizing Ligand, Methylthiophenolate, *submitted*.
86. Jensen, S.C.; Weiss, E.A. Direct Visible-light, Room-Temperature Photocatalytic Reduction of Nitrobenzene to Aniline by Quantum Dots, *submitted*.
85. Edme, K.; Homan, S.B.; **Weiss, E.A.** Ultrafast Exciton Decay in PbS Quantum Dots with Surface-adsorbed Tetracyanoquinodimethane (TCNQ) *via* Auger Recombination with a Localized Surface State, *submitted*.
84. Holbrook, R.J.; Weinberg, D.J.; Peterson, M.D.; **Weiss, E.A.**; **Meade, T.J.** Light-Activated Protein Inhibition through Photoinduced Electron transfer of a Ruthenium(II)-Cobalt(III) Bimetallic Complex, *J. Am. Chem. Soc.*, 137, 3379–3385 (2015).
83. Jin S.; Tagliacruzchi, M.; Son, H.-J.; Harris, R.D.; Aruda, K.O.; Weinberg, D.J.; Nepomnyashchii, A; **Farha, O.K.**; **Hupp, J.T.**; **Weiss, E.A.** Enhancement of the Yield of Photoinduced Charge Separation in Zinc Porphyrin-Quantum Dot Complexes by a *bis*-Dithiocarbamate Linkage, *J. Phys. Chem. C*, 119, 5195–5202 (2015).
82. Lau, B.; **Szleifer, I.G.**; **Ratner, M.A.**; **Weiss, E.A.** Optimal Features of a Quantum Flashing Electron Ratchet, *submitted*.
81. Weinberg, D.J.; Dyar, S.M.; Khademi, Z.; Malicki, M.; **Marder, S.**; **Wasielewski, M.R.**; **Weiss, E.A.** Spin-Selective Charge Recombination in Complexes of CdS Quantum Dots and Organic Hole Acceptors, *J. Am. Chem. Soc.*, 136, 14513-14518 (2014).
80. Tagliacruzchi, M.; Zou, F.; **Weiss, E.A.** Kinetically Controlled Self-assembly of Latex-Microgel Core-Satellite Particles, *J. Phys. Chem. Lett.*, 5, 2775-2780, **ACS Editors' Choice Article (2014)**.
79. Jin, S.; Harris, R.D.; Lau, B.; Aruda, K.O.; Amin, V.A.; **Weiss, E.A.** Enhanced Rate of Radiative Decay in CdSe Quantum Dots upon Adsorption of an Exciton-Delocalizing Ligand, *Nano Lett.*, 14, 5323-5328 (2014).
78. Cass, L.C.; Swenson, N.K.; **Weiss, E.A.** Electronic and Vibrational Structure of Complexes of Tetracyanoquinodimethane with Cadmium Chalcogenide Quantum Dots, *J. Phys. Chem. C*, 118, 18263–18270 (2014).
77. Tagliacruzchi, M.; **Weiss, E.A.**; **Szleifer, I.** Dissipative Self-assembly of Particles Interacting through Time-oscillatory Potentials, *Proc. Natl. Acad. Sci.*, 111, 9751-9756 (2014).
76. McPhail, M.R.; Weiss, E.A. The Role of Organosulfur Compounds in the Growth and Final Surface Chemistry of PbS Quantum Dots, *Chem. Mater.*, 26, 3377-3384, **ACS Editors' Choice Article (2014)**.

75. Rasmussen, A.M.; Ramakrishna, S.; **Weiss, E.A.**; **Seideman, T.** Theory of Ultrafast Photoinduced Electron Transfer from a Bulk Semiconductor to a Quantum Dot, *J. Chem. Phys.*, 140, 144102 (2014).
74. Peterson, M.D.; Jensen, S.C.; Weinberg, D.J.; **Weiss, E.A.** The Mechanisms for Adsorption of Methyl Viologen on CdS Quantum Dots, *ACS Nano*, 8, 2826-2837 (2014).
73. **Weiss, E.A.** Controlling Interfacial Processes in Excitonic Nanoparticles, *Guest commentary, J. Phys. Chem. Lett.*, 5, 361-362 (2014).
72. Tice, D.B.; Li, S.; Tagliazucchi, M.; Buchholz, D.B.; **Weiss, E.A.**; **Chang, R.P.H.** Ultrafast Modulation of the Plasma Frequency of Vertically Aligned ITO Nanowire Arrays, *Nano Lett.*, 14, 1120-1126 (2014).
71. Peterson, M.D.; Cass, L.C.; Harris, R.; Edme, K.; Sung, K.; **Weiss, E.A.** The Role of Ligands in Determining the Exciton Relaxation Dynamics in Semiconductor Quantum Dots, *Ann. Rev. Phys. Chem.*, 65, 317-339 (2014).
70. Peterson, M.D.; Holbrook, R.J.; **Meade, T.J.**; **Weiss, E.A.** Photoinduced Electron Transfer from PbS Quantum Dots to Cobalt(III) Schiff Base Complexes: Light Activation of a Protein Inhibitor, *J. Am. Chem. Soc.*, 135, 13162-13167 (2013).
69. Knowles, K.E.; Tagliazucchi, M.; Malicki, M.; Swenson, N.K.; **Weiss, E.A.** Electron Transfer as a Probe of the Permeability of Organic Monolayers on the Surfaces of Colloidal PbS Quantum Dots, *J. Phys. Chem. C*, 117, 15849- 15857 (2013).
68. Cass, L.C.; Malicki, M.; **Weiss, E.A.** The Chemical Environments of Oleate Species within Samples of Oleate-Coated PbS Quantum Dots, *Anal. Chem.*, 85, 6974 - 6979 (2013).
67. **Weiss, E.A.** Organic Molecules as Tools to Control the Growth, Surface Structure and Redox Activity of Colloidal Quantum Dots, *Acc. Chem. Res.*, 46, 2607-2615 (2013).
66. Tice, D.B.; Weinberg, D.J.; Mathew, N.; **Chang, R.P.H.**; **Weiss, E.A.** Measurement of Wavelength-Dependent Polarization Character in the Absorption Anisotropies of Ensembles of CdSe Nanorods, *J. Phys. Chem. C*, 117, 13289 - 13296 (2013).
65. Aruda, K.O.; Tagliazucchi, M.; Sweeney, C.M.; Hannah, D.C.; **Weiss, E.A.** The Role of Interfacial Charge Transfer-Type Interactions in the Decay of Plasmon Excitations in Metal Nanoparticles, *Phys. Chem. Chem. Phys.*, 15, 7441 - 7449 (2013).
64. Knowles, K.E.; Peterson, M.D.; McPhail, M.R.; **Weiss, E.A.** Exciton Dissociation within Quantum Dot-Organic Complexes: Mechanisms, Use as a Probe of Interfacial Structure, and Applications, *J. Phys. Chem. C*, 117, 10229-10243 (2013).
63. Knowles, K.E.; Malicki, M.; Parameswaran, R.; Cass, L.C.; **Weiss, E.A.** Spontaneous Multi-Electron Transfer from the Surfaces of PbS Quantum Dots to TCNQ, *J. Am. Chem. Soc.*, 135, 7264-7271 (2013).
62. Aruda, K.O.; Tagliazucchi, M.; Sweeney, C.M.; Hannah, D.C.; **Schatz, G.C.**; **Weiss, E.A.** Identification of Parameters through which Surface Chemistry Determines the Lifetimes of Hot Electrons in Small Au Nanoparticles, *Proc. Natl. Acad. Sci.*, 110, 4212-4217 (2013).
61. Shastry, T.A.; Morris-Cohen, A.J.; **Weiss, E.A.**; **Hersam, M.C.** Probing Carbon Nanotube-Surfactant Interactions with Two-Dimensional DOSY NMR, *J. Am. Chem. Soc.*, 135, 6750-6753 (2013).
60. Frederick, M.T.; Amin, V.A.; **Weiss, E.A.** The Optical Properties of Strongly Coupled Quantum Dot-Ligand Systems, *J. Phys. Chem. Lett.*, 4, 634-640 (2013).

59. Frederick, M.T.; Amin, V.A. Swenson, N.K.; Ho, A.Y.; **Weiss, E.A.** Control of Exciton Confinement in Quantum Dot-Organic Complexes through Modulation of the Energetic Alignment of Interfacial Orbitals, *Nano Lett.*, 13, 287-292 (2013).
58. Morris-Cohen, A.J.; Peterson, M.D.; Kamm, J.; Frederick, M.T.; **Weiss, E.A.** Evidence for a Through-Space Path for Electron Transfer from Quantum Dots to Carboxylate-Functionalized Viologens, *J. Phys. Chem. Lett.*, 3, 2840-2844 (2012).
57. Evans, C.M.; Love, A.M.; **Weiss, E.A.** Surfactant-Controlled Polymerization of Semiconductor Clusters to Quantum Dots through Competing Step-Growth and Living Chain-Addition Mechanisms, *J. Am. Chem. Soc.*, 134, 17298-17305 (2012).
56. Morris-Cohen, A.J.; Malicki, M.; Peterson, M.D.; Slavin, J.J.W.; **Weiss, E.A.** Chemical, Structural, and Quantitative Analysis of the Ligand Shells of Colloidal Quantum Dots, *Chem. Mater.*, 25, 1155-1165 (2013).
55. Tagliazucchi, M.; Blaber, M.; **Schatz, G.C.; Weiss, E.A.; Szleifer, I.** The Optical Properties of Responsive Hybrid Au@polymer Nanoparticles, *ACS Nano*, 6, 8397-8406 (2012).
54. Knowles, K.E.; Malicki, M.; **Weiss, E.A.** Dual-Timescale Photoinduced Electron Transfer from PbS Quantum Dots to a Molecular Acceptor, *J. Am. Chem. Soc.*, 134, 12470 – 12473 (2012).
53. Malicki, M.; Knowles, K.E.; **Weiss, E.A.** Gating of Hole Transfer from Photoexcited PbS Quantum Dots to Aminoferrocene by the Ligand Shell of the Dots, *Chem. Commun.*, Special Emerging Investigators issue, 49, 4400-4402 (2013).
52. Tagliazucchi, M.; Amin, V.; Schneebeli, S.T.; **Stoddart, J.F.; Weiss, E.A.** High-contrast photopatterning of photoluminescence within quantum dot films through degradation of a charge-transfer quencher, *Adv. Mater. (Frontispiece)*, 24, 3617-3621 (2012).
51. Evans, C.M.; Cass, L.C.; Knowles, K.E.; Tice, D.B.; **Chang, R.P.H.; Weiss, E.A.** Synthesis and Properties of Colloidal Quantum Dots: The Evolving Role of Coordinating Surface Ligands, *J. Coord. Chem.*, 65, 2391-2414 (2012).
50. Morris-Cohen, A.J.; Aruda, K.O.; Rasmussen, A.; Canzi, G.; **Seideman, T.; Kubiak, C.P.; Weiss, E.A.** Controlling the Rate of Electron Transfer between a Quantum Dot and a Tri-Ruthenium Molecular Cluster by Tuning the Chemistry of the Interface, *Phys. Chem. Chem. Phys.*, Special Issue on Electron Transfer Theory, 14, 13794-13801 (2012).
49. McArthur, E.A.; Godbe, J.M.; Tice, D.B.; **Weiss, E.A.** A Study of the Binding of Cyanine Dyes to Colloidal Quantum Dots using Spectral Signatures of Dye Aggregation, *J. Phys. Chem. C*, 116, 6136-6142 (2012).
48. Morris-Cohen, A.J.; Vasilenko, V.; Amin, V.A.; Reuter, M.; **Weiss, E.A.** A Model for Adsorption of Ligands to Colloidal Quantum Dots with Concentration-Dependent Surface Structure, *ACS Nano*, 6, 557-565 (2012).
47. Knowles, K.E.; Frederick, M.T.; Tice, D.B.; Morris-Cohen, A.J., **Weiss, E.A.** Colloidal Quantum Dots: Think Outside the (Particle-in-a-)Box. *J. Phys. Chem. Lett.*, 3, 18-26 (2012).
46. Tagliazucchi, M.; Tice, D.B., Sweeney, C.M.; Morris-Cohen, A.J.; **Weiss, E.A.** Ligand-Controlled Rates of Photoinduced Electron Transfer in Hybrid CdSe Nanocrystal/Poly(viologen) Films, *ACS Nano*, 5, 9907-9917 (2011).
45. Frederick, M.T.; Cass, L.C.; Amin, V.A.; **Weiss, E.A.** A Molecule to Detect and Perturb the Confinement of Charge Carriers in Quantum Dots, *Nano Lett.*, 11, 5455-5460 (2011).

44. Morris-Cohen, A.J.; Frederick, M.T.; Cass, L.C.; **Weiss, E.A.** Simultaneous Determination of the Adsorption Constant and the Photoinduced Electron Transfer Rate for a CdS Quantum Dot-Viologen Complex with Transient Absorption Spectroscopy, *J. Am. Chem. Soc.*, 133, 10146–10154 (2011).
43. Peterson, M.D.; Hayes, P.L.; Martinez, I.S.; Cass, L.C.; Achtyl, J.L.; **Weiss, E.A.**; **Geiger, F.M.**, Second Harmonic Generation Imaging with a kHz Amplifier, *Optics Mater. Expr.*, 1, 57-66 (2011).
42. Frederick, M.T.; Achtyl, J.L.; Knowles, K.E.; **Weiss, E.A.**; **Geiger, F.M.** Surface-Amplified Ligand Disorder in CdSe Quantum Dots Determined by Electron and Coherent Vibrational Spectroscopies, *J. Am. Chem. Soc.*, 133, 7476-7481 (2011).
41. Lilly, G.D.; Whalley, A.C.; Grunder, S.; Valente, C.; Frederick, M.T.; **Stoddart, J.F.**; **Weiss, E.A.** Switchable Photoconductivity of Quantum Dot Films using Cross-Linking Ligands with Light-Sensitive Structures, *J. Mater. Chem.*, 21, 11492-11497 (**Front Cover Article**) (2011).
40. Knowles, K.E.; McArthur, E.A.; **Weiss, E.A.** A Multi-Timescale Map of Radiative and Nonradiative Decay Pathways for Excitons in CdSe Quantum Dots, *ACS Nano*, 5, 2026-2035 (2011).
39. Tice, D.B.; Frederick, M.T.; **Chang, R.P.H.**; **Weiss, E.A.** Electron Migration Limits the Rate of Photobrightening in Thin Films of CdSe Quantum Dots in a Dry N<sub>2</sub>(g) Atmosphere, *J. Phys. Chem. C*, 115, 3654-3662 (2011).
38. Donakowski, M.D.; Godbe, J.; Sknepnek, R.; Knowles, K.E.; **Olvera de la Cruz, M.**; **Weiss, E.A.** A Quantitative Description of the Binding Equilibria of para-Substituted Aniline Ligands and CdSe Quantum Dots, *J. Phys. Chem. C*, 114, 22526-22534 (2010).
37. McArthur, E.A.; Morris-Cohen, A.J.; Knowles, K.E.; **Weiss, E.A.** Charge Carrier Resolved Relaxation of the First Excitonic State in CdSe Quantum Dots Probed with Near-Infrared Transient Absorption Spectroscopy, *J. Phys. Chem. B*, 114, 14514–14520 (2010).
36. Frederick, M.T., **Weiss, E.A.**, Relaxation of Exciton Confinement in CdSe Quantum Dots by Modification with a Conjugated Dithiocarbamate Ligand, *ACS Nano*, 4, 3195-3200 (2010).
35. Morris-Cohen, A.J.; Frederick, M.T.; Lilly, G.D.; McArthur, E.A.; **Weiss, E.A.** Organic Surfactant-Controlled Composition of the Surfaces of CdSe Quantum Dots, *J. Phys. Chem. Lett.*, 1, 1078-1081 (2010).
34. Morris-Cohen, A.J.; Donakowski, M.D.; Knowles, K.E.; **Weiss, E.A.** The Effect of a Common Purification Procedure on the Chemical Composition of the Surfaces of CdSe Quantum Dots Synthesized with Trioctylphosphine Oxide (TOPO), *J. Phys. Chem. C*, 114, 897-906 (2010).
33. Knowles, K.E.; Tice, D.B.; McArthur, E.A.; Solomon, G.C.; **Weiss, E.A.** Chemical Control of the Photoluminescence of CdSe Quantum Dot-Organic Complexes with a Series of *p*-Substituted Aniline Ligands, *J. Am. Chem. Soc.*, 132, 1041-1050 (2010).
32. Nakanishi, H.; Bishop, K.J.; Kowalczyk, B.; **Nitzan, A.**; **Weiss, E.A.**; Tretiakov, K.V.; Apodaca, M.M.; Klajn, R.; **Stoddart, J.F.**; **Grzybowski, B.A.** Photoconductance and inverse photoconductance in films of functionalized metal nanoparticles, *Nature*, 460, 371-375 (2009).

+ 31 Publications from Postdoctoral and PhD Work

## **PROFESSIONAL AFFILIATIONS AND SERVICE**

### ***Conference Organization:***

5. Co-organizer of the Symposium "At the interface between molecules and materials" at the American Physical Society Meeting, March 2015
4. Host of the *Materials Horizons* Symposium, supported by the Royal Society of Chemistry, Northwestern University, July 2014
3. Creator and Chair of the new Gordon Research Conference on Colloidal Nanocrystals, July 2014
2. Elected Vice-Chair of the Gordon Research Conference on Clusters, Nanocrystals, and Nanostructures for 2013
1. Co-organizer for the Symposium "Surfaces of Nanoscale Semiconductors" for the MRS Spring National Meeting, 2013

### ***Department, College, and University Service:***

6. Director of Industry Relations for the Northwestern Materials Research Science and Engineering Center (NU-MRSEC) (2013 – present)
5. Director of Graduate Studies, Department of Chemistry (2013 – present)
4. Director of the International Institute of Nanotechnology-hosted REU program at Northwestern (2013 – present)
3. Goldwater Scholarship Selection Committee (2010, 2013, 2014)
2. Faculty speaker, Ryan Fellows monthly meeting (2012)
1. Judge, Undergraduate Research Symposium (2009, 2010, 2011)

### ***Center Affiliations and Professional Memberships:***

7. Center for Bio-Inspired Energy Science (CBES), a DOE Energy Frontier Research Center: co-PI, co-leader of the subgroup on Bio-Inspired Transport of Charge and Energy, 2014 – present
6. Argonne-Northwestern Solar Energy Research (ANSER) Center, a DOE Energy Frontier Research Center: co-PI, 2012 – present
5. Non-Equilibrium Research Center (NERC), a DOE Energy Frontier Research Center: co-PI, Leader of the Dynamic Materials Subgroup, 2009 – 2014
4. Northwestern Materials Research Science and Engineering Center (MRSEC): co-PI, 2009 – present
3. American Chemical Society (ACS): member, 2004 - present
2. Materials Research Society (MRS): member, 2008 – present
1. National Center for Learning and Teaching in Nanoscale Science and Engineering: 2008 – 2010

### ***Community Outreach:***

5. Mentor, Chemistry Women Mentorship Network (2014 – present)
4. Host lab for high school enrichment program for students from the Lindblom school (local public school) (Organizer: Regan Thomson)
3. Invited speaker at the Chicago ACS Section Meeting (Feb 2012)
2. Lecturer for the Associated Colleges of the Chicago Area, Special Topics in Chemistry Course on Materials Chemistry (Sept 2011)
1. Invited speaker at the Illinois Chemical Education Foundation 55<sup>th</sup> Annual Scholarship luncheon, sponsored by The Chemical Industry Council of Illinois