ANDREW B. GREYTAK

WORK ADDRESS

Department of Chemistry and Biochemistry
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EDUCATION

Massachusetts Institute of Technology	Postdoctoral	2006-2010
Harvard University	Ph.D. in Chemistry	2006
	A.M.	2002
Massachusetts Institute of Technology	S.B. in Chemistry	2000

PROFESSIONAL EXPERIENCE

Associate Professor of Chemistry	University of South Carolina	2018-present
Assistant Professor of Chemistry	University of South Carolina	2010-2018
Postdoctoral Fellowship in Chemistry	Massachusetts Institute of Technology	2006-2010

TEACHING EXPERIENCE

USC:

Undergraduate:

CHEM 112: General Chemistry II. (Fall 2012, F'13, Sp'15).

CHEM 541: Physical Chemistry: Chemical Thermodynamics and Kinetics. (F'11, Sp'13, F'14, F'15, F'16, F'18, F'20, Sp'22, Sp'24).

CHEM 542L: Physical Chemistry Laboratory: Quantum Chemistry and Spectroscopy. (every semester Fall 2016-present).

Graduate:

CHEM 649/749/719 / ENCP 789 / IGERT 710: Special Topics in Physical and Inorganic Chemistry: Chemistry and Physics of Low-Dimensional Materials (Nanoscience). (F'10, Sp'12, Sp'14, Sp'16, F'17, Sp'20, Sp'23). *Developed this course*.

ENCP 789 / IGERT 713: Solar Energy Devices. (F'14, Sp'18). *Co-developed this course*.

AWARDS

Distinguished Research Service Award, University of South Carolina, 2022.

Mungo Undergraduate Teaching Award, University of South Carolina, 2020.

Breakthrough Rising Star Award, University of South Carolina, 2019.

Two Thumbs Up Award, USC Office of Student Disability Services, 2017.

ACS-CEI Award for Incorporating Sustainability into Chemistry Education, Committee on Environmental Improvement, American Chemical Society, 2014.

Sustainable Carolina Curriculum Award, USC, received twice: 2013, 2015.

Life Sciences Research Foundation (LSRF) Postdoctoral Fellowship, 2006. Sponsor: Novartis.

National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2001.

PUBLICATIONS

Peer reviewed journal articles (independent career):

*** indicates corresponding author, Greytak group students underlined.**

46. Joshua Williams, Musbau Gbadamosi, Andrew B. Greytak, and Michael L. Myrick. Measuring the Surface Area of Carbon Black using BET Isotherms: An Experiment in Physical Chemistry. *J. Chem. Ed.*, **2023***, 100*, 4838-4844. doi: https://doi.org/10.1021/acs.jchemed.3c00764

45. Llorenç Rubert, Md Faizul Islam, Andrew B. Greytak, Rahul Prakash, Mark D. Smith, Rosa Maria Gomila, Antonio Frontera, Linda S. Shimizu, and Bartolome Soberats.* Two-Dimensional Supramolecular Polymerization of a Bis-Urea Macrocycle into a Brick-Like Hydrogen-Bonded Network. *Angew. Chem. Int. Ed.* **2023**, e202312223. https://doi.org/10.1002/anie.202312223.

44. G. C. Thaggard, G. A. Leith, D. Sosnin, C. R. Martin, K. C. Park, M. K. McBride, J. Lim, B. J. Yarbrough, B. K. P. Maldeni Kankanamalage, G. R. Wilson, A. R. Hill, M. D. Smith, S. Garashchuk, A. B. Greytak, I. Aprahamian and N. B. Shustova.* Confinement-Driven Photophysics in Hydrazone-Based Hierarchical Materials. *Angewandte Chemie International Edition* **2023***, 62*, e202211776. https://doi.org/10.1002/anie.202211776.

43. M. F. Islam, E. Adame-Ramirez, E. R. Williams, P. Kittikhunnatham, A. Wijesekera, S. Zhang, T. Ge, M. Stefik, M. D. Smith, P. J. Pellechia, A. B. Greytak and L. S. Shimizu.* Inclusion Polymerization of Pyrrole and Ethylenedioxythiophene in Assembled Triphenylamine Bis-Urea Macrocycles. *Macromolecules* **2022,** *55*, 11013–11022. https://doi.org/10.1021/acs.macromol.2c02042.

42. A. B. Greytak,* S. L. Abiodun, J. M. Burrell, E. N. Cook, N. P. Jayaweera, M. M. Islam and A. E. Shaker. Thermodynamics of Nanocrystal–Ligand Binding through Isothermal Titration Calorimetry. *Chem. Commun*. **2022**, *58*, 13037–13058. https://doi.org/10.1039/D2CC05012A.

41. J. H. Dunlap, N. P. Jayaweera, P. J. Pellechia and A. B. Greytak.* Competitive Anionic Exchange of Thiolate Ligands onto Aqueous Phosphonate-Capped Quantum Dots. *J. Phys. Chem. C*, **2022**, *126*, 17635–17646.

40. Nattakarn Phromsiri, Sakiru L. Abiodun, Chonnavee Manipuntee, Pannee Leeladee, Andrew B. Greytak, and Numpon Insin.* Fluorescent responses of CdSe and Si QDs toward Copper (II) ion and the mixed-QDs probe for Cu^{2+} ion sensing. *Journal of Molecular Structure*, **2023**, *1271*, 134050.

39. Muhammad S. Hossain, Fiaz Ahmed, Stavros G. Karakalos, Mark D. Smith, Namrata Pant, Sophya Garashchuk, Andrew B. Greytak, Pablo Docampo, and Linda S. Shimizu.* Structure–property investigations in urea tethered iodinated triphenylamines. *Phys. Chem. Chem. Phys*. **2022**, *24*, 18729-18737.

38. Nuwanthaka P. Jayaweera, John H. Dunlap, Fiaz Ahmed, Taylor Larison, Leman Buzoglu Kurnaz, Morgan Stefik, Perry J. Pellechia, Augustus W. Fountain, III, and Andrew B. Greytak.* Coordination of Quantum Dots in a Polar Solvent by Small-Molecule Imidazole Ligands. *Inorg. Chem.* **2022**, *61*, 10942-10949.

37. Sakiru L. Abiodun, Megan Y. Gee, and Andrew B. Greytak.* Combined NMR and Isothermal Titration Calorimetry Investigation Resolves Conditions for Ligand Exchange and Phase Transformation in $CsPbBr_3$ Nanocrystals. *J. Phys. Chem. C* **2021***, 125*, 17897–17905.

36. Fiaz Ahmed, Mathew L. Kelley, MVS Chandrashekhar, and Andrew B. Greytak.* Improved Charge Transport in PbS Quantum Dot Thin Films following Gel Permeation Chromatography Purification. *J. Phys. Chem. C* **2021***, 125*, 17796–17805.

35. Fiaz Ahmed, John H. Dunlap, Perry J. Pellechia, and Andrew B. Greytak.* A *p*-type PbS quantum dot ink with improved stability for solution processable optoelectronics. *Chem. Commun.,* **2021**, *57*, 8091-8094.

33. Mathew L. Kelley, Fiaz Ahmed, Grigory Simin, Kamal Hussain, Asif Khan, Andrew B. Greytak,* and M. V. S. Chandrashekhar.* Spatially Resolved Fourier Transform Impedance Spectroscopy: A Technique to Rapidly Characterize Interfaces, Applied to a QD/SiC Heterojunction. *Applied Physics Letters,* **2021***, 118*, 223102.

32. Mathew L. Kelley, Fiaz Ahmed, Sakiru L. Abiodun, Mohammad Usman, Mohi Uddin Jewel, Kamal Hussain, Hans-Conrad zur Loye, M. V. S. Chandrashekhar, and Andrew B. Greytak.* Photoconductive Thin Films Composed of Environmentally Benign $AgBiS_2$ Nanocrystal Inks Obtained through a Rapid Phase Transfer Process. *ACS Applied Electronic Materials* **2021***, 3,* 1550-1555. **doi:** 10.1021/acsaelm.0c01107

31. Corey R. Martin, Kyoung Chul Park, Ryan E. Corkill, Preecha Kittikhunnatham, Gabrielle A. Leith, Abhijai Mathur, Sakiru L. Abiodun, Andrew B Greytak and Natalia Shustova.* Photoresponsive Frameworks: Energy Transfer in the Spotlight. *Faraday Discussions,* **2021***, 231,* 266-280. **doi:** 10.1039/D1FD00013F

30. Sakiru L. Abiodun, Perry J. Pellechia, and Andrew B. Greytak.* Effective Purification of $CsPbBr_3$ Nanocrystals with High Quantum Yield and High Colloidal Stability Via Gel Permeation Chromatography. *J. Phys. Chem. C* **2021***, 125,* 3463-3471. **doi:** 10.1021/acs.jpcc.1c00207

29. Corey R. Martin, Gabrielle A. Leith, Preecha Kittikhunnatham, Kyoung Chul Park, Otega A. Ejegbavwo, Abhijai Mathur, Cameron R. Callahan, Shelby L. Desmond, Myles R. Keener, Fiaz Ahmed, Shubham Pandey, Mark D. Smith, Simon R. Phillpot, Andrew B. Greytak, and Natalia B. Shustova.* Heterometallic Actinide-Containing Photoresponsive Metal-Organic Frameworks: Dynamic and Static Tuning of Electronic Properties. *Angewandte Chemie, Intl. Ed.* **2021**, *60*, 8072. **doi:** 10.1002/anie.202016826

28. Megan Y. Gee, Yi Shen, and Andrew B. Greytak.* Isothermal Titration Calorimetry Resolves Sequential Ligand Exchange and Association Reactions in Treatment of Oleate-Capped CdSe Quantum Dots with Alkylphosphonic Acid. *J. Phys. Chem. C* **2020**, *124*, 23964. **doi:** 10.1021/acs.jpcc.0c07338

27. Corey R. Martin, Preecha Kittikhunnatham, Gabrielle A. Leith, Anna A. Berseneva, Kyoung Chul Park, Andrew B. Greytak & Natalia B. Shustova.* Let the light be a guide: Chromophore communication in metal-organic frameworks. *Nano Research.* **2020** (20 August). **doi:** 10.1007/s12274-020-3017-0

26. Adam Roberge, John H. Dunlap, Fiaz Ahmed, and Andrew B. Greytak.* Size-Dependent PbS Quantum Dot Surface Chemistry Investigated via Gel Permeation Chromatography. Chem. Mater. **2020**, *32*, 6588. **doi:** 10.1021/acs.chemmater.0c02024

25. Taewan Kim, Mathew L. Kelley, Duckjong Kim,* **Andrew B. Greytak*** & Sohee Jeong.* Purification of Colloidal Nanocrystals Along the Road to Highly Efficient Photovoltaic Devices. *Int. J. of Precis. Eng. and Manuf.-Green Tech.* **2020**. **doi:** 10.1007/s40684-020-00231-5.

24. Luke A. M. Lyle, Serdal Okur, Venkata S. N. Chava, Mathew L. Kelley, Robert F. Davis, Gary S. Tompa, M. V. S. Chandrashekhar, **Andrew B. Greytak** & Lisa M. Porter.* Characterization of Epitaxial β-$(Al,Ga,In)_2O_3$-Based Films and Applications as UV Photodetectors. *J. Electronic Materials* **2020**. **doi:** 10.1007/s11664-020-07985-3

23. Mathew L. Kelley, Joshua Letton, Grigory Simin, Fiaz Ahmed, Cole A. Love-Baker, **Andrew B. Greytak,*** and M. V. S. Chandrashekhar.* Photovoltaic and Photoconductive Action Due to PbS Quantum Dots on Graphene/SiC Schottky Diodes from NIR to UV. *ACS Appl. Electron. Mater*. **2020**, *2*, 134. **doi:** 10.1021/acsaelm.9b00651.

22. Ekaterina A. Dolgopolova, Vladimir A. Galitskiy, Corey R. Martin, Haley N. Gregory, Brandon J. Yarbrough, Allison M. Rice, Anna A. Berseneva, Otega A. Ejegbavwo, Kenneth S. Stephenson, Preecha Kittikhunnatham, Stavros G. Karakalos, Mark D. Smith, Andrew B. Greytak, Sophya Garashchuk, and Natalia B. Shustova.* Connecting Wires: Photoinduced Electronic Structure

Modulation in Metal–Organic Frameworks *J. Am. Chem. Soc.* **2019**, *141*, 5350-5358. **doi:** 10.1021/jacs.8b13853

21. John H. Dunlap, Abigail F. Loszko, Raeven E. Flake, Yucheng Huang. Brian C. Benicewicz, and **Andrew B. Greytak**.* Multiply-binding polymeric imidazole ligands: Influence of molecular weight and monomer sequence on colloidal quantum dot stability. *J. Phys. Chem. C.* **2018**, *122*, 26756–26763. **doi:** 10.1021/acs.jpcc.8b08984.

20. Venkata N. Surya Chava, Bobby G. Barker Jr., Anusha Balachandran, Asif Khan, G. Simin, **Andrew B. Greytak**, and M. V. S. Chandrashekhar.* High detectivity visible-blind SiF_4-grown epitaxial graphene/SiC Schottky contact bipolar phototransistor. *Applied Physics Letters* **2017**, *111*, 243504. **doi:** 10.1063/1.5009003.

19. Bobby G. Barker Jr., Venkata Surya N. Chava, Kevin M. Daniels, M. V. S. Chandrashekhar, and **Andrew B. Greytak.*** Sub-bandgap response of graphene/SiC Schottky emitter bipolar phototransistor examined by scanning photocurrent microscopy. *2D Materials* **2018**, *5*, 011003. **doi:** 10.1088/2053-1583/aa90b1.

18. Adam Roberge, Jennifer L. Stein, Yi Shen, Brandi M. Cossairt, and **Andrew B. Greytak.*** Purification and in-situ ligand exchange of metal-carboxylate treated fluorescent InP quantum dots via gel permeation chromatography. *J. Phys. Chem. Lett.* **2017**, *8*, 4055-4060. **doi:** 10.1021/acs.jpclett.7b01772.

17. Preecha Kittikhunnatham, Bozumeh Som, Vitaly Rassolov, Matthias Stolte, Frank Würthner, Linda S. Shimizu, and **Andrew B. Greytak.*** Fluorescence polarization measurements to probe alignment of a bithiophene dye in 1D channels of self-assembled phenylethynylene bis-urea macrocycle crystals. *J. Phys. Chem. C.*, **2017**, *121*, 18102. **doi:** 10.1021/acs.jpcc.7b07136

16. Allison M. Rice, W. Brett Fellows, Ekaterina A. Dolgopolova, **Andrew B. Greytak**, Aaron K. Vannucci, Mark D. Smith, S. G. Karakalos, J. A. Krause, S. M. Avdoshenko, A. A. Popov, and Natalia B. Shustova.* Hierarchical corannulene-based materials: energy transfer and solid-state photophysics. *Angewandte Chemie, Intl. Ed.* **2017**, *56*, 4525–4529. **doi:** 10.1002/anie.201612199

15. Yi Shen, Megan Y. Gee, and **Andrew B. Greytak.*** Purification technologies for colloidal nanocrystals. *Chem. Comm.,* **2017**, *53*, 827. **doi:** 10.1039/C6CC07998A

14. Derek E. Williams, Ekaterina A. Dolgopolova, Danielle C. Godfrey, Evgeniya D. Ermolaeva, Perry J. Pellechia, **Andrew B. Greytak**, Mark D. Smith, Stanislav M. Avdoshenko, Alexey A. Popov, and Natalia B. Shustova.* Fulleretic well-defined scaffolds: Donor–fullerene alignment through metal coordination and its effect on photophysics. *Angewandte Chemie, Intl. Ed.* **2016**, *55*, 9070. **doi:** 10.1002/anie.201603584

13. Yi Shen, Adam Roberge, Rui Tan, Megan Y. Gee, Dylan C. Gary, Yucheng Huang, Douglas A. Blom, Brian C. Benicewicz, Brandi M. Cossairt and **Andrew B. Greytak.*** Gel permeation chromatography as a multifunctional processor for nanocrystal purification and on-column ligand exchange chemistry. *Chemical Science* **2016**, *7*, 5671. **doi:** 10.1039/C6SC01301E

12. Xia Zhao, Yi Shen, Enoch A. Adogla, Anand Viswanath, Rui Tan, Brian C. Benicewicz, **Andrew B. Greytak,*** Yuan Lin, and Qian Wang. Surface labeling of enveloped virus with polymeric imidazole ligand-capped quantum dots via metabolic incorporation of phospholipid in host cells. *J. Mater. Chem. B.* **2016**, *4*, 2421. **doi:** 10.1039/C6TB00263C

11. Rui Tan, Yi Shen, Stephen K. Roberts, Megan Y. Gee, Douglas A. Blom, and **Andrew B. Greytak.*** Reducing Competition by Coordinating Solvent Promotes Morphological Control in Alternating Layer Growth of CdSe/CdS Core/Shell Quantum Dots. *Chemistry of Materials* **2015**, *27*, 7468. **doi:** 10.1021/acs.chemmater.5b03588

10. Ekaterina A. Dolgopolova, Derek E. Williams, **Andrew B. Greytak**, Allison M. Rice, Mark D. Smith, Jeanette A. Krause, and Natalia B. Shustova.* A bio-inspired approach for chromophore communication: ligand-to-ligand and host-to-guest energy transfer in hybrid crystalline scaffolds. *Angewandte Chemie, Intl. Ed.* **2015**, *54*, 13639. **doi**: 10.1002/anie.201507400

9. Anand Viswanath, Pravin Paudel, Preecha Kittikhunnatham, Alexandra N. Green, **Andrew B. Greytak**, and Brian C. Benicewicz.* Synthesis of random terpolymers bearing multidentate imidazole units and their use in functionalization of cadmium sulfide nanowires. *Polymer*

Chemistry **2015**, *6*, 7036. **doi**: 10.1039/C5PY00685F (*major contribution*)

8. Colin M. Johnson, Kayla M. Pate, Yi Shen, Anand Viswanath, Rui Tan, Brian C. Benicewicz, Melissa A. Moss, and **Andrew B. Greytak.*** A methacrylate-based polymeric imidazole ligand yields quantum dots with low cytotoxicity and low nonspecific binding. *Journal of Colloid and Interface Science* **2015**, *458*, 310. (*undergraduate first author*)

7. Yi Shen, Rui Tan, Megan Y. Gee, and **Andrew B. Greytak.*** Quantum Yield Regeneration: Influence of Neutral Ligand Binding on Photophysical Properties in Colloidal Core/Shell Quantum Dots. *ACS Nano* **2015**, *9*, 3345. **doi:** 10.1021/acsnano.5b00671

6. Derek E. Williams, Ekaterina A. Dolgopolova, Perry J. Pellechia, Andrei Palukoshka, Thomas J. Wilson, Rui Tan, Josef M. Maier, **Andrew B. Greytak**, Mark D. Smith, Jeanette A. Krause, and Natalia B. Shustova.* Mimic of the green fluorescent protein β-barrel: Photophysics and dynamics of confined chromophores defined by a rigid porous scaffold. *J. Am. Chem. Soc.* **2015**, *137*, 2223. **doi:** 10.1021/ja5131269

5. Anand Viswanath, Yi Shen, Alexandra N. Green, Rui Tan, **Andrew B. Greytak**, and Brian C. Benicewicz.* Copolymerization and synthesis of multiply binding histamine ligands for the robust functionalization of quantum dots. *Macromolecules* **2014**, *47*, 8137. **doi:** 10.1021/ma501955t (*major contribution*)

4. Derek E. Williams, Joseph A. Rietman, Josef M. Maier, Rui Tan, **Andrew B. Greytak**, Mark D. Smith, Jeanette A. Krause, and Natalia B. Shustova. Energy transfer on demand: photoswitch-directed behavior of metal–porphyrin frameworks. *J. Am. Chem. Soc.* **2014**, *136*, 11886. **doi:** 10.1021/ja505589d

3. Weiwei L. Xu, Mark D. Smith, Jeanette A. Krause, **Andrew B. Greytak**, Shuguo Ma, Cory M. Read, and Linda S. Shimizu.* Single crystal to single crystal polymerization of a self-assembled diacetylene macrocycle affords columnar polydiacetylenes. *Crystal Growth & Design* **2014**, *14*, 993. **doi:** 10.1021/cg401380a

2. Rui Tan, Douglas A. Blom, Shuguo Ma, and **Andrew B. Greytak.*** Probing surface saturation conditions in alternating layer growth of CdSe/CdS core/shell quantum dots. *Chemistry of Materials* **2013**, *25*, 3724. **doi:** 10.1021/cm402148s (*cover article*)

1. Yi Shen, Megan Y. Gee, Rui Tan, Perry J. Pellechia, **Andrew B. Greytak.*** Purification of quantum dots by gel permeation chromatography and the effect of excess ligands on shell growth and ligand exchange. *Chemistry of Materials* **2013**, *25*, 2838. **doi:** 10.1021/cm4012734

Peer reviewed journal articles (from prior appointments):

15. Christopher M. Lemon, Peter N. Curtin, Rebecca C. Somers, **Andrew B. Greytak**, Ryan M. Lanning, Rakesh K. Jain, Moungi G. Bawendi, and Daniel G. Nocera.* Metabolic Tumor Profiling with pH, Oxygen, and Glucose Chemosensors on a Quantum Dot Scaffold. *Inorganic Chemistry* **2013**, *53*, 1900. **doi:** 10.1021/ic401587r

14. Rebecca C. Somers, Ryan M. Lanning, Preston T. Snee, **Andrew B. Greytak**, Rakesh K. Jain, Moungi G. Bawendi, and Daniel G. Nocera.* A Nanocrystal-based Ratiometric pH Sensor for Natural pH Ranges. *Chemical Science* **2012**, *3*, 2980. **doi:** 10.1039/C2SC20212C

13. **Andrew B. Greytak,*** Peter M. Allen, Wenhao Liu, Jing Zhao, Elizabeth R. Young, Zoran Popović, Brian J. Walker, Daniel G. Nocera, and Moungi G. Bawendi. Alternating layer addition approach to CdSe/CdS core/shell quantum dots with near-unity quantum yield and high on-time fractions. *Chemical Science* **2012**, *3*, 2028. **doi:** 10.1039/C2SC00561A

12. Zoran Popović, Wenhao Liu, Vikash P. Chauhn, Jungmin Lee, Cliff Wong, **Andrew B. Greytak**, Numpon Insin, Daniel G. Nocera, Dai Fukumura, Rakesh K. Jain, and Moungi G. Bawendi.* A Nanoparticle Size Series for In Vivo Fluorescence Imaging. *Angewandte Chemie, Int Ed.* **2010**, *49*, 8649. **doi:** 10.1002/anie.201003142

11. Wenhao Liu, **Andrew B. Greytak**, Jungmin Lee, Cliff R. Wong, Jongnam Park, Lisa F. Marshall, Wen Jiang, Peter N. Curtin, Alice Y. Ting, Daniel G. Nocera, Dai Fukumura, Rakesh K. Jain, and Moungi G. Bawendi.* Compact biocompatible quantum dots via RAFT-mediated synthesis of imidazole-based random copolymer ligand. *J. Am. Chem. Soc*. **2010**, *132*, 472.

doi: 10.1021/ja908137d

10. Emily J. McLaurin, **Andrew B. Greytak**, Moungi G. Bawendi, and Daniel G. Nocera.* Two-Photon Absorbing Nanocrystal Sensors for Ratiometric Detection of Oxygen. *J. Am. Chem. Soc*. **2009**, *131*, 12994. **doi:**10.1021/ja902712b

9. Shahram Pouya, Manoochehr M. Koochesfahani,* **Andrew B. Greytak**, Moungi G. Bawendi, and Daniel G. Nocera. Experimental evidence of diffusion-induced bias in near-wall velocimetry using quantum dot measurements. *Experiments in Fluids* **2008**, *44*, 1035. **doi:** 10.1007/s00348-008-0491-7

8. Wenhao Liu, Mark Howarth, **Andrew B. Greytak**, Yi Zheng, Daniel G. Nocera,* Alice Y. Ting,* and Moungi G. Bawendi.* Compact biocompatible quantum dots functionalized for cellular imaging. *J. Am. Chem. Soc*. **2008**, *130*, 1274. **doi:**10.1021/ja076069p

7. Fernando Patolsky, Brian P. Timko, Guihua Yu, Ying Fang, **Andrew B. Greytak**, Gengfeng Zheng, and Charles M. Lieber.* Detection, stimulation, and inhibition of neuronal signals with high-density nanowire transistor arrays, *Science* **2006**, *313*, 1100. **doi:**10.1126/science.1128640

6. **Andrew B. Greytak**, Carl J. Barrelet, Yat Li, and Charles M. Lieber.* Semiconductor nanowire laser and nanowire waveguide electro-optic modulators, *Applied Physics Letters* **2005**, *87*, 151103. **doi:**10.1063/1.2089157

5. Oliver Hayden,* **Andrew B. Greytak**, and David C. Bell. Core-Shell Nanowire Light-Emitting Diodes. *Advanced Materials*, **2005**, *17*, 701. **doi:**10.1002/adma.200401235

4. David C. Bell, Oliver Hayden, **Andrew B. Greytak**, and Charles M. Lieber.* Single Crystal Three-Armed Cadmium Sulfide Nanowires (Nano-Tripods). *Microscopy and Microanalysis* **2004**, *10-S02***,** 386. **doi:** 10.1017/S1431927604883557

3. Carl J. Barrelet,[†] **Andrew B. Greytak**,[†] and Charles M. Lieber.* Nanowire photonic circuit elements. *Nano Letters* **2004**, *4*, 1981. **doi:**10.1021/nl048739k ([†]*Equal contributors*)

2. **Andrew B. Greytak**, Lincoln J. Lauhon, Mark S. Gudiksen, and Charles M. Lieber.* Growth and transport properties of complementary germanium nanowire field effect transistors. *Applied Physics Letters* **2004**, *84*, 4176. **doi:**10.1063/1.1755846

1. **Andrew B. Greytak,*** Alexander Y. Grosberg, and Toyoichi Tanaka.* Shape imprinting due to variable disulfide bonds in polyacrylamide gels. *Journal of Chemical Physics* **2001**, *114*, 10551. **doi:**10.1063/1.1369139

Book chapter:

1. "Prospects for rational control of nanocrystal shape through successive ionic layer adsorption and reaction," **Andrew B. Greytak,*** Rui Tan, and Stephen K. Roberts. To appear in: *Anisotropic and Shape-Selective Nanomaterials: Structure-Property Relationships*, Editors: Simona E. Hunyadi Murph, George K. Larsen, and Kaitlin J. Coopersmith. (Springer: 2017). ISBN: 978-3-319-59662-4

Invited talks (independent career)

47. "Lead-free nanocrystal inks for flexible optoelectronic devices," Spring 2024 Interational Meeting of the Electrochemical Society, San Francisco, CA, 29 May 2024.

46. "Measuring and visualizing photocurrent in colloidal quantum dot films," "Light as a reactant and product" virtual Saturday Seminar Series, 18 May 2024.

45. "Ligand exchange equilibrium at quantum dot surfaces in polar and aqueous solvent environments". Spring 2024 American Chemical Society Meeting, New Orleans, LA, 18 March 2024.

44. "Quantum Dots and the Physical Chemistry of Nanocrystal Surfaces". University of South Carolina, Department of Chemistry & Biochemistry, 19 January 2024.

43. "Ligand exchange equilibrium at quantum dot surfaces in polar and aqueous solvent environments". Fall 2023 Materials Research Society Meeting, Boston, MA, Nov 27-Dec 1.

42. "Examining effects of surface chemistry on quantum dots and nanocrystal films with time-

resolved techniques". 2023 Southeast Regional Meeting of the American Chemical Society (SERMACS), Durham, NC, 26 October 2023.

41. "Quantum dot surfaces in polar environments". University of Alabama (Department of Chemistry & Biochemistry), Tuscaloosa, AL, 3 October 2023.
40. "Stabilizing semiconductor nanocrystal surfaces in polar solvent environments". 2022 North Carolina Photochemistry Conference (October 8, Columbia, SC).
39. "Ligand exchange at chalcogenide and perovskite nanocrystal surfaces examined via isothermal titration calorimetry". Fall 2022 International Meeting of the Electrochemical Society (October 12, Atlanta, GA).
38. "Investigating nanocrystal surface chemistry through chromatography and calorimetry." American Chemical Society Spring 2021 Virtual Meeting and Expo. Division of Inorganic Chemistry. April 12, 2021.
37. "Quantum Dots: More than what you see on TV." Western Carolinas American Chemical Society local section meeting, Lander University, Greenwood, SC, 21 January 2021 (virtual).
36. "Quantum Dots: More than what you see on TV." Middle Tennessee State University (Department of Chemistry), Murfeesboro, TN, 23 October 2020 (virtual).
35. "Purification and surface chemistry of colloidal nanocrystals and nanowires." University of Michigan (Department of Chemistry), Ann Arbor, MI, 27 June 2019.
34. "Measuring quantum dot-ligand equilibrium in purified samples." University of California (Department of Chemistry), Riverside, CA, 14 January 2019.
33. "Nanoscale interfaces in 0, 1, and 2 dimensions: From core/shell nanocrystals to epitaxial graphene." 2018 Southeast Regional Meeting of the American Chemical Society (SERMACS, talk 724), Augusta, GA, 2 Nov 2018.
32. "Quantum dot-ligand equilibrium in purified samples: Expanding the material scope." 2018 Gordon Research Conference on Colloidal Semiconductor Nanocrystals, Smithfield, RI (Bryant University), 16 July 2018.
31. "Quantum dot-ligand equilibrium in purified samples." 255th American Chemical Society National Meeting (talk COLL 136), New Orleans, LA, 18 March 2018.
30. "Assembling the future through control of nanoscale interfaces." University of South Carolina (Department of Physics and Astronomy), Columbia, SC, 1 February 2018.
29. "Shining a light on nanoscale interfaces: From quantum dots to photocurrent imaging." University of South Carolina (Department of Chemistry & Biochemistry), Columbia, SC, 25 August 2017.
28. "Clean nanocrystals for clean energy & advanced technologies." 254th American Chemical Society National Meeting (talk INOR 361), Washington, DC, 21 August 2017.
27. "Purification and ligand exchange chemistry of colloidal quantum dots for fluorescence and optoelectronic applications." Center for Advanced Solar Photophysics Summer School, Los Alamos National Laboratory, Los Alamos, NM, 1-2 August 2017.
26. "Nanomaterial surfaces in 0, 1, and 2 dimensions: Results from chromatography and functional imaging." 253rd American Chemical Society National Meeting (talk INOR 537), San Francisco, CA, 3 April 2017.
25. "Quantum Dot Purification and Metrics for Rational Control of Shell Growth, Ligand Exchange, and Quantum Yield." Vanderbilt University (Department of Chemistry / Vanderbilt Institute for Nanoscale Science and Engineering), Nashville, TN, 29 March 2017.
24. "Quantum Dot Purification and Metrics for Rational Control of Shell Growth, Ligand Exchange, and Quantum Yield." University of California (Department of Chemistry and Biochemistry), San Diego, CA, 3 March 2017.
23. "Conditions for effective nanocrystal shape control in colloidal SILAR reactions." 2017 National Meeting of the Minerals, Metals, and Materials Society (TMS), San Diego, CA, 1 March 2017.

22. "Small-angle X-ray scattering for quantum dot sizing and film characterization."2016 Southeast Regional Meeting of the American Chemical Society, Columbia, SC, 24 October, 2016.
21. "Structure-Property-Relationships of Nanoscale Materials in the Greytak Group." 2016 Southeast Regional Meeting of the American Chemical Society, Columbia, SC, 24 October, 2016.
20. "Nanocrystal Photochemistry." (Discussion Leader presentation). 2016 Gordon Research Conference on Colloidal Semiconductor Nanocrystals, Mt. Snow, VT, 4 August 2016.
19. "Quantum Dot Purification and Metrics for Rational Control of Shell Growth, Ligand Exchange, and Quantum Yield." University of Washington (Department of Chemistry), Seattle, WA, 5 April 2016.
18. "Quantum Dot Purification and Metrics for Rational Control of Shell Growth, Ligand Exchange, and Quantum Yield." Portland State University (Department of Chemistry), Portland, OR, 4 April 2016.
17. "Quantum Dot Purification and Metrics for Rational Control of Shell Growth, Ligand Exchange, and Quantum Yield." University of Rochester (Department of Chemistry), Rochester, NY, 16 November 2015.
16. "A sequential chemistry of nanocrystal quantum dots through purification, stoichiometry, and measurement." Appalachian State University (Department of Chemistry), Boone, NC, 30 October 2015.
15. "Quantum Dot Purification and Metrics for Rational Control of Shell Growth, Ligand Exchange, and Quantum Yield." Wake Forest University (Department of Chemistry), Winston Salem, NC, 28 October 2015.
14. "Quantum Dot Purification and Metrics for Rational Control of Shell Growth, Ligand Exchange, and Quantum Yield." 2015 Materials Research Society Spring Meeting (talk N4.06), San Francisco, CA, 8 April 2015.
13. "A sequential chemistry of semiconductor nanocrystals through purification, stoichiometry, and measurement." Florida State University (Department of Chemistry), Tallahassee, FL, 2 March 2015.
12. "Quantum dot purification and metrics for rational control of shell growth, ligand exchange, and quantum yield." Georgia Institute of Technology (Department of Chemistry), Atlanta, GA, 17 February 2015.
11. "Regeneration of quantum yield upon introduction of representative ligands to purified core/shell colloidal quantum dots." North Carolina Photochemistry Symposium, North Carolina State University, Raleigh, NC, 11 October 2014.
10. "A sequential chemistry of semiconductor nanocrystals through purification, stoichiometry, and measurement." Roanoke College (Department of Chemistry), Salem, VA, 10 October 2014.
9. "Quantum dot purification and metrics for rational control of shell growth, ligand exchange, and quantum yield." 248th American Chemical Society National Meeting (talk INOR 47), San Francisco, CA, August 10, 2014.
8. "A sequential chemistry of semiconductor nanocrystals through purification, stoichiometry, and measurement." University of Notre Dame (Department of Chemistry), Notre Dame, IN, 27 March 2014.
7. "Sustainability in the curriculum of Chem 112 at the University of South Carolina." 247th American Chemical Society National Meeting (talk CHED 45), Dallas, TX, 16 March 2014.
6. "A sequential chemistry of semiconductor nanocrystals through purification, stoichiometry, and measurement." University of South Carolina (Department of Chemistry and Biochemistry), Columbia, SC, 13 September 2013.
5. "Interfacial chemistry of semiconductor nanocrystals." University of North Carolina (Department of Chemistry), Charlotte, NC, 15 October 2012.
4. "Interfacial chemistry of semiconductor nanocrystals." University of South Carolina (Chemistry

and Biochemistry: Physical Chemistry divisional seminar series on Nanostructures and Photovoltaics), Columbia, SC, 25 June 2012.

3. "Challenging the trade-offs in synthesis and application of core/shell nanocrystal fluorophores." 141st Annual Meeting of the Minerals, Metals, and Materials Society (TMS), Orlando, FL, 12 March 2012.
2. "Interfacial properties of semiconductor nanocrystals and nanowires." College of Charleston (Department of Chemistry), Charleston, SC, 27 October 2011.
1. "The energy challenge … and your stake in it!" Inaugural Meeting of the University of South Carolina Student Chapter of the American Chemical Society, Columbia, SC, 28 September 2011.

GRANTS FUNDED

External research grants:

5. US NSF, "Ligand exchange equilibrium at quantum dot surfaces in polar and aqueous solvent environments." Andrew B. Greytak, PI. 6/15/2021-5/31/2024, $443,292.
4. US NSF, "MADE in SC Thrust 1." Andrew B. Greytak, PI. 9/1/2017-8/31/2023, $90,708. (Sub-award from NSF EPSCOR RII Track 1 Award "Materials Assembly and Design Excellence in South Carolina: MADE in SC", Prakash Nagarkatti, PI).
3. US NSF, "Minority Carriers in Graphene/SiC Schottky Emitter Bipolar Phototransistors for High Gain Visible Blind UV Detection." MVS Chandrashekhar and Andrew B. Greytak, co-PIs. 7/31/2017-7/30/2021, $369,999.
2. US NSF, "Equilibrium Thermodynamics of Semiconductor Nanocrystal Ligand and Ion Exchange via Calorimetry." Andrew B. Greytak, PI. 6/15/2016-12/31/2020, $420,779.
1. Savannah River National Laboratory / US Department of Energy, SRNS RFP SC0273: "Quantum Dots-Titania Nano-Photocatalysts." Andrew B. Greytak, PI. 4/4/2011-8/31/2011, $45,000.

External training and infrastructure grants:

4. MRI: Acquisition of the NanoFrazor - a unique AFM-based nanolithography tool to support multidisciplinary research and promote nanoscience in South Carolina and beyond. Yanwen Wu, PI. Thomas Crawford, Scott Crittenden, Melissa Moss, and Andrew Greytak, co-PIs. 2019-2022, $529,693.
3. US NSF, EPSCOR RII Track-1, "Materials Assembly and Design Excellence in South Carolina: MADE in SC." Prakash Nagarkatti, PI. Andrew B. Greytak is senior personnel and Thrust co-author. 2017-2022, $20,000,000. (sub-award listed above).
2. US NSF, IGERT program, "Functional Nanomaterials for Sustainable Energy Solutions." Andrew B. Greytak, co-PI; lead PIs Christopher T. Williams (USC Chem. Eng.), Donna A. Chen, Jochen Lauterbach (USC Chem. Eng.), William Sandberg (USC Business). 2013-2018 (5 years), $3,000,000 total. (Has supported 4 grad students with 2-year fellowships: value >$240,000 to Greytak group).
1. South Carolina EPSCOR / US NSF, Scientific Advocate Network Track III, "Research participtation in calorimetry of nanoparticles." Andrew B. Greytak, PI. 7/9/2012 – 12/31/2012, $6,270.

Internal competitive research grants:

USC Office of Research, Aspire-II, "Rare-earth free high brightness quantum dot inks for III-nitride pumped light emitters." MVS Chandrashekhar, Andrew B. Greytak, and Asif Khan, co-PIs. 6/15/2021-6/14/2022, $100,000.

USC Office of Research, ASPIRE-I: Electrical Characterization of Quantum Dot/Graphene Junctions & the Effect of Ligand Exchange. Andrew Greytak, PI. 7/1/2020-9/30/2021, $15,000.

USC Office of Research, ASPIRE-I, "Patterned photochemical doping of semiconductor nanowires." Andrew B. Greytak, PI. 7/1/2018-9/30/2019, $15,000.

USC Office of Research, ASPIRE-III, "Acquisition of Isothermal Titration Calorimeter for Biochemistry And Nanoscience Research Development." Andrew B. Greytak, PI and Thomas Makris, co-PI. 7/1/2017-4/15/2019, $100,000. (instrument acquisition)

USC Office of Research, Aspire-II, "The Center for Biomaterials and Cardiovascular Repair." Francis

G. Spinale, John F. Eberth, Andrew B. Greytak, Tarek M. Shazly, and Mark J. Uline, co-PIs. 7/1/2015-6/30/2016, $100,000 (20% share).

USC Office of Research, Aspire-I (Track I), "Demonstration of ligand binding and release from single semiconductor nanowires." Andrew B. Greytak, PI. 2013-2014 (1 year), $15.000.

Internal competitive training grants:

USC Office of Undergraduate Research, Magellan Scholars Program: 6 awards, $3,000 each.

USC Office of Research, SPARC Graduate Fellowship: 5 awards, $5,000 each.

RESEARCH SUPERVISION

Postdoctoral (in progress)

Gryphon A. Drake

PhD (completed)

Yi Shen, Rui Tan, Pravin Paudel, Bobby G. Barker, Preecha Kittikhunnatham, Megan Y. Gee, Adam Roberge, Mathew L. Kelley, John H. Dunlap, Fiaz Ahmed, Sakiru Abiodun, Nuwanthaka P. Jayaweera Millaniyage

PhD (in progress)

Jennii M. Burrell, Md Moinul Islam, Abdulla E Shaker, Bishal Adhikari, Farjana Haque Mitu, Nuwandi K. Jayasekara D.M.

MS (completed)

Stephen K. Roberts

BS (completed)

Hanna Altpeter, Aaron Cameron, Tyler Cranford, Emily N. Cook, Peter Fairchild, Raeven E. Flake, Colin M. Johnson, Boyd Lever, Abigail F. Loszko, Cole A. Love-Baker, Christopher Pinion

BS (in progress)

Camilla Morgan, Connor Dow, Veby Youssef

PROFESSIONAL ACTIVITIES

Professional Societies

American Association for the Advancement of Science

American Chemical Society

American Physical Society

Materials Research Society

Reviewer Service

Reviewed articles for the following journals: Accounts of Chemical Research, ACS Applied Materials and Interfaces, ACS Nano, Analytical Chemistry, Chemical Communications, Chemistry of Materials, Journal of the American Chemical Society, Journal of Chemical Physics, Journal of Cluster Science, Journal of the Electrochemical Society, Journal of Nanophotonics, Journal of Physical Chemistry, Materials Science in Semiconductor Processing, Nano Letters, Nanoscale, Optics Express, Sensors and Actuators B.

Reviewed proposals for the following agencies: LANL/Center for Integrated Nanotechologies, ACS-PRF, LBNL/Molecular Foundry, Fdn. for Fundamental Research on Matter (Netherlands), FWO (Belgian Nat'l Fund for Scientific Research), Oak Ridge Associated Universities, US Department of Energy, US National Science Foundation.

Synergistic Activities

Symposium organizer, "Quantum Dot Science & Technology," 245th International Meeting of the Electrochemical Society, May 2024.

Chair, Nanoscience Subdivision, American Chemical Society Division of Inorganic Chemistry, 2020.

Symposium organizer, "Chemistry at the Interface of Solution-Processed Inorganic Materials,"

257th National Meeting of the American Chemical Society, March 2019.

Symposium organizer, "Structure-property relationships in nanoscale materials," Southeast Regional Meeting of the American Chemical Society, October 2016.

Faculty mentor, instructor, and co-PI: NSF IGERT program "Functional Nanomaterials for Sustainable Energy," USC, 2013-2018.

Faculty Mentor, ACS SEED program for economically disadvantaged high school students, 2013-2015.

Faculty Sustainability Fellow, USC. Founder and organizer of annual USC Sustainability Research and Practice Showcase for USC researchers, student groups, and community, 2013-present.

Head Judge for Chemistry & Biochemistry, Central South Carolina Region II Science and Engineering Fair (high school science competition and Intel ISEF qualifier), Columbia, SC, 2013-present.

RESEARCH INTERESTS

Chemistry and physics of materials, including the synthesis and surface modification of low-dimensional materials; study of electronic excited states in quantum-confined systems; energy transfer, charge transfer, and charge separation on molecular length-scales; interactions of low-dimensional and disordered materials at fluid interfaces; and the organization of materials via designed chemical interactions. Additionally, the design of nanoelectronic and nanophotonic systems to yield electronic and/or optically-based probes for biological systems, and for energy conversion.

Faculty profile page (research group link within):

http://sc.edu/study/colleges_schools/chemistry_and_biochemistry/our_people/greytak_andrew.php