

Bryce Sadtler

Department of Chemistry
Washington University in Saint Louis
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A. Professional Preparation

- Dec. 2002 Dual B.S. degrees in Chemistry and Materials Chemistry, Purdue University, West Lafayette, IN
- May 2009 Ph.D. in Physical Chemistry, University of California, Berkeley, CA
Advisor: A. Paul Alivisatos
- 2009 – 2014 Postdoctoral research, California Institute of Technology, Pasadena, CA
Advisor: Nathan S. Lewis

B. Appointments

- 7/2022 – present Associate Professor, Department of Chemistry, Washington University, St. Louis, MO
- 7/2014 – 6/2022 Assistant Professor, Department of Chemistry, Washington University, St. Louis, MO
- 5/2013 – 07/2014 Senior Postdoctoral Scholar, Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA
- 5/2010 – 04/2013 Beckman Institute Postdoctoral Scholar, Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA
- 8/2009 – 04/2010 Postdoctoral Scholar, Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA

C. Fellowships, Scholarships, and Awards

While at Washington University

- National Science Foundation Faculty Early CAREER Award (2018)
- American Chemical Society Petroleum Research Fund Doctoral New Investigator Award (2017)
- Journal of Materials Chemistry C (Royal Society of Chemistry) Emerging Investigator (2017)

Prior to Washington University

- Beckman Institute Postdoctoral Fellowship at the California Institute of Technology (2010 – 2013)
- National Science Foundation East Asia and Pacific Summer Institute (EAPSI) Fellowship w/ Professor Jinwoo Cheon, Yonsei University, Seoul, Korea (2008)
- Department of Energy, Excellence in Technology Transfer Award, Lawrence Berkeley National Laboratory (2007)
- Fulbright Scholar w/ Professor Jean-Pierre Sauvage, University of Strasbourg, France (2003)
- Barry M. Goldwater Scholarship (2000 – 2002)

D. Publications

h-index: 20 (4361 total citations as of January 11th, 2024, from 38 peer-reviewed publications)

Publications while at Washington University

**Indicates corresponding author(s)*

- 38) M. Shen, W.H. Rackers, **B. Sadtler***, “Getting the Most Out of Fluorogenic Probes: Challenges and Opportunities in Using Single-Molecule Fluorescence to Image Electro- and Photocatalysis.” **Chemical & Biomedical Imaging** 2023, 1, 692-715.
<https://pubs.acs.org/doi/10.1021/cbmi.3c00075>
- 37) D. Zhang, X. S. Wu, D. Wang, **B. Sadtler*** “Size-dependent miscibility controls the kinetics of anion exchange in cesium lead halide nanocrystals.” **The Journal of Chemical Physics** 2023, 159, 014701. <https://doi.org/10.1063/5.0149821>
- 36) C. Qin, J. Luo, D. Zhang, L. Brennan, S. Tian, A. Berry, B. M. Campbell, **B. Sadtler*** “Light-Mediated Electrochemical Synthesis of Manganese Oxide Enhances Its Stability for Water Oxidation.” **ACS Nanoscience Au** 2023, 3, 310-322.
<https://pubs.acs.org/doi/10.1021/acsnanoscienceau.3c00002>
- 35) B. Sadtler “Competition for nanoscale heterostructures.” **Nature Synthesis** 2023, 2, 86-87.
<https://www.nature.com/articles/s44160-022-00220-3>
- 34) J. Luo, G. Ren, B. Campbell, D. Zhang, T. Cao. R. Mishra*, **B. Sadtler*** “Spontaneous Seed Formation During Electrodeposition Drives Epitaxial Growth of Metastable Bismuth Selenide Microcrystals.” **Journal of the American Chemical Society** 2022, 144, 18272-18285.
<https://pubs.acs.org/doi/10.1021/jacs.2c05261>
- 33) M. Shen, T. Ding, C. Tan, W. H. Rackers, D. Zhang, M. D. Lew, **B. Sadtler*** “In Situ Imaging of Catalytic Reactions on Tungsten Oxide Connects Surface–Ligand Redox Chemistry with Photocatalytic Activity.” **Nano Letters** 2022, 22, 4694-4701.
<https://pubs.acs.org/doi/10.1021/acs.nanolett.2c00674>
- 32) M. Shen, T. Ding, W. H. Rackers, C. Tan, K. Mahmood, M. D. Lew, **B. Sadtler*** “Single-Molecule Colocalization of Redox Reactions on Semiconductor Photocatalysts Connects Surface Heterogeneity and Charge–Carrier Separation in Bismuth Oxybromide.” **Journal of the American Chemical Society** 2021, 143, 11393-11403.
<https://pubs.acs.org/doi/10.1021/jacs.1c02377>
- 31) D. Wang, D. Zhang, **B. Sadtler*** “Irreversibility in Anion Exchange Between Cesium Lead Bromide and Iodide Nanocrystals Imaged by Single-Particle Fluorescence.” **The Journal of Physical Chemistry C** 2020, 124, 27158-27168.
<https://pubs.acs.org/doi/10.1021/acs.jpcc.0c08323>
- 30) M. Shen, T. Ding, J. Luo, C. Tan, K. Mahmood, Z. Wang, D. Zhang, R. Mishra, M. D. Lew, **B. Sadtler*** “Competing Activation and Deactivation Mechanisms in Photodoped Bismuth Oxybromide Nanoplates Probed by Single-Molecule Fluorescence Imaging.” **The Journal of Physical Chemistry Letters** 2020, 11, 5219-5277.
<https://pubs.acs.org/doi/10.1021/acs.jpcllett.0c01237>
- 29) D. Wang, J. Cavin, B. Yin, A. S. Thind, A. Y. Borisevich, R. Mishra, **B. Sadtler*** “Role of Solid-State Miscibility during Anion Exchange in Cesium Lead Halide Nanocrystals Probed by Single-Particle Fluorescence.” **The Journal of Physical Chemistry Letters** 2020, 11, 952-959. <https://pubs.acs.org/doi/10.1021/acs.jpcllett.9b03633>
- 28) M. Shen, T. Ding, S. T. Hartman, F. Wang, C. Krucylak, Z. Wang, C. Tan, B. Yin, R. Mishra, M. D. Lew*, **B. Sadtler*** “Nanoscale Colocalization of Fluorogenic Probes Reveals the Role of Oxygen Vacancies in the Photocatalytic Activity of Tungsten Oxide Nanowires.” **ACS Catalysis** 2020, 10, 2088-2099. <https://pubs.acs.org/doi/10.1021/acscatal.9b04481>

- 27) C. Qin, B. M. Campbell, M. Shen, T. Zhao, **B. Sadtler*** “Light-Driven, Facet-Selective Transformation of Cuprous Oxide Microcrystals to Hollow Copper Nanoshells.” **Chemistry of Materials** 2019, 31, 8000-8011. <https://pubs.acs.org/doi/10.1021/acs.chemmater.9b02240>
- 26) B. Yin, J. Cavin, D. Wang, D. Khan, M. Shen, C. Laing, R. Mishra, **B. Sadtler*** “Fluorescence microscopy of single lead bromide nanocrystals reveals sharp transitions during their transformation to methylammonium lead bromide.” **Journal of Materials Chemistry C** 2019, 7, 3486-3495. <https://pubs.rsc.org/en/content/articlelanding/2019/TC/C8TC06470A#!divAbstract>
- 25) W. Zhu, M. Shen, G. Fan, A. Yang, J. R. Meyer, Y. Ou, B. Yin, J. Fortner, M. Foston, Z. Li, Z. Zou, **B. Sadtler*** “Facet-Dependent Enhancement in the Activity of Bismuth Vanadate Microcrystals for the Photocatalytic Conversion of Methane to Methanol.” **ACS Applied Nano Materials** 2018, 1, 6683-6691. <https://pubs.acs.org/doi/10.1021/acsanm.8b01490>
- 24) C. Tan, C. Qin, **B. Sadtler*** “Light-directed growth of metal and semiconductor nanostructures.” **Journal of Materials Chemistry C** 2017, 5, 5628-5642. <http://pubs.rsc.org/en/content/articlelanding/2017/tc/c7tc00379j#!divAbstract>
Invited article for 2017 Emerging Investigators special issue.
- 23) B. Yin, X. Huang, R. Mishra, **B. Sadtler*** “Compositionally Induced Twin Defects Control the Shape of Ternary Silver Halide Nanocrystals.” **Chemistry of Materials** 2017, 29, 1014-1021. <http://pubs.acs.org/doi/full/10.1021/acs.chemmater.6b03660>
- 22) E. Thimsen, **B. Sadtler**, M. Y. Berezin* “Shortwave-Infrared (SWIR) Emitters for Biological Imaging: a Review of Challenges and Opportunities.” **Nanophotonics** 2017, 6, 1043-1054. <https://doi.org/10.1515/nanoph-2017-0039>
- 21) X. Chen, Y. Myung, A. Thind, Z. Gao, B. Yin, M. Shen, S. B. Cho, P. Cheng, **B. Sadtler**, R. Mishra, P. Banerjee* “Atmospheric pressure chemical vapor deposition of methylammonium bismuth iodide thin films.” **Journal of Materials Chemistry A** 2017, 5, 24728-24739. <http://pubs.rsc.org/en/content/articlelanding/2017/ta/c7ta06578g#!divAbstract>
- 20) B. Yin, **B. Sadtler**, M. Y. Berezin, E. Thimsen* “Quantum dots protected from oxidative attack using alumina shells synthesized by atomic layer deposition.” **Chemical Communications** 2016, 52, 11127-11130. <http://pubs.rsc.org/en/content/articlelanding/2016/cc/c6cc05090e#!divAbstract>
- 19) L. Mu, F. Wang, **B. Sadtler**, R. A. Loomis, W. E. Buhro* “Influence of the Nanoscale Kirkendall Effect on the Morphology of Copper Indium Disulfide Nanoplatelets Synthesized by Ion Exchange.” **ACS Nano** 2015, 9, 7419-7428. <http://pubs.acs.org/doi/abs/10.1021/acs.nano.5b02427>

Publications prior to Washington University

- 18) C. M. Blumenfeld, **B. F. Sadtler**, G. E. Fernandez, L. Dara, C. Nguyen, F. Alonso-Valenteen, L. Medina-Kauwe, R. A. Moats, N. S. Lewis, R. H. Grubbs, H. B. Gray, K. Sorasaenee “Cellular Uptake and Cytotoxicity of a Near-IR Fluorescent Corrole–TiO₂ Nanoconjugate.” **Journal of Inorganic Biochemistry** 2014, 140, 39-44. <http://www.sciencedirect.com/science/article/pii/S0162013414001767>
- 17) **B. Sadtler**, S. P. Burgos, N. A. Batara, J. A. Beardslee, H. A. Atwater, N. S. Lewis “Phototropic Growth Control of Nanoscale Pattern Formation in Photoelectrodeposited Se–Te Films.” **Proceedings of the National Academy of Sciences** 2013, 110, 19707-19712. <http://www.pnas.org/content/110/49/19707.full>
- 16) J. R. McKone, **B. F. Sadtler**, C. A. Werlang, N. S. Lewis, H. B. Gray “Ni–Mo Nanopowders for Efficient Electrochemical Hydrogen Evolution.” **ACS Catalysis** 2013, 3, 166-169. <http://pubs.acs.org/doi/abs/10.1021/cs300691m>

- 15) H. Zheng, **B. Sadtler**, C. Habenicht, B. Freitag, A. P. Alivisatos, C. Kisielowski “Controlling Electron Beam-Induced Structure Modifications and Cation Exchange in Cadmium Sulfide–Copper Sulfide Heterostructured Nanorods.” **Ultramicroscopy** 2013, 134, 207-213.
<http://www.sciencedirect.com/science/article/pii/S030439911300123X>
- 14) J. A. Beardslee, **B. Sadtler**, N. S. Lewis “Magnetic Field Alignment of Randomly Oriented, High Aspect Ratio Silicon Microwires into Vertically Oriented Arrays.” **ACS Nano** 2012, 6, 10303-10310. <http://pubs.acs.org/doi/abs/10.1021/nn304180k>
- 13) H. Zheng, J. B. Rivest, T. A. Miller, **B. Sadtler**, A. Lindenberg, M. F. Toney, L.-W. Wang, C. Kisielowski, A. P. Alivisatos, “Observation of Transient Structural-Transformation Dynamics in a Cu₂S Nanorod.” **Science** 2011, 333, 206-209.
<https://www.science.org/doi/abs/10.1126/science.1204713>
- 12) P. Peng, **B. Sadtler**, A. P. Alivisatos, R. J. Saykally, “Exciton Dynamics in CdS–Ag₂S Nanorods with Tunable Composition Probed by Ultrafast Transient Absorption Spectroscopy.” **The Journal of Physical Chemistry C** 2010, 114, 5879-5885.
<http://pubs.acs.org/doi/abs/10.1021/jp9116722>
- 11) A. M. Zaniewski, M. Loster, **B. Sadtler**, A. P. Alivisatos, A. Zettl, “Direct Measurement of the Built-in Potential in a Nanoscale Heterostructure.” **Physical Review B** 2010, 82, 155311.
<http://journals.aps.org/prb/abstract/10.1103/PhysRevB.82.155311>
- 10) J. M. Luther, H. Zheng, **B. Sadtler**, A. P. Alivisatos, “Synthesis of PbS Nanorods and Other Ionic Nanocrystals of Complex Morphology by Sequential Cation Exchange Reactions.” **Journal of the American Chemical Society** 2009, 131, 16851–16857.
<http://pubs.acs.org/doi/abs/10.1021/ja906503w>
- 9) **B. Sadtler**, D. O. Demchenko, H. Zheng, S. M. Hughes, M. G. Merkle, U. Dahmen, L.-W. Wang, A. P. Alivisatos, “Selective Facet Reactivity during Cation Exchange in Cadmium Sulfide Nanorods.” **Journal of the American Chemical Society** 2009, 131, 5285-5293.
<http://pubs.acs.org/doi/abs/10.1021/ja809854q>
- 8) D. O. Demchenko, R. D. Robinson, **B. Sadtler**, C. K. Erdonmez, A. P. Alivisatos, L.-W. Wang, “Formation Mechanism and Properties of CdS-Ag₂S Nanorod Superlattices.” **ACS Nano** 2008, 2, 627-636. <http://pubs.acs.org/doi/abs/10.1021/nn700381y>
- 7) Y. Wu, C. Wadia, W. Ma, **B. Sadtler**, A. P. Alivisatos, “Synthesis and Photovoltaic Application of Copper(I) Sulfide Nanocrystals.” **Nano Letters** 2008, 8, 2551-2555.
<http://pubs.acs.org/doi/abs/10.1021/nl801817d>
- 6) R. D. Robinson, **B. Sadtler**, D. O. Demchenko, C. K. Erdonmez, L.-W. Wang, A. P. Alivisatos, “Spontaneous Superlattice Formation in Nanorods Through Partial Cation Exchange.” **Science** 2007, 317, 355-358. <https://www.science.org/doi/10.1126/science.1142593>
- 5) D. V. Talapin, J. H. Nelson, E. V. Shevchenko, S. Aloni, **B. Sadtler**, A. P. Alivisatos, “Seeded Growth of Highly Luminescent CdSe/CdS Nanoheterostructures with Rod and Tetrapod Morphologies.” **Nano Letters** 2007, 7, 2951-2959.
<http://pubs.acs.org/doi/abs/10.1021/nl072003g>
- 4) Y. Zhao, **B. Sadtler**, M. Lin, G. H. Hockerman, A. Wei, “Nanoprobe Implantation into Mammalian Cells by Cationic Transfection.” **Chemical Communications** 2004, 7, 784-785.
<http://pubs.rsc.org/en/content/articlelanding/2004/cc/b317061f#!divAbstract>
- 3) **B. Sadtler**, A. Wei, “Spherical Ensembles of Gold Nanoparticles on Silica: Electrostatic and Size Effects.” **Chemical Communications** 2002, 15, 1604-1605.
<http://pubs.rsc.org/en/content/articlelanding/2002/cc/b204760h#!divAbstract>
- 2) A. Wei, B. Kim, **B. Sadtler**, S. L. Tripp, “Tunable Surface-Enhanced Raman Scattering from Large Gold Nanoparticle Arrays.” **ChemPhysChem** 2001, 2, 743-745.
[http://onlinelibrary.wiley.com/doi/10.1002/1439-7641\(20011217\)2:12%3C743::AID-CPHC743%3E3.0.CO;2-1/full](http://onlinelibrary.wiley.com/doi/10.1002/1439-7641(20011217)2:12%3C743::AID-CPHC743%3E3.0.CO;2-1/full)

- 1) R. Balasubramanian, J. Xu, B. Kim, **B. Sadtler**, A. Wei, “Extraction and Dispersion of Large Gold Nanoparticles in Nonpolar Solvents.” **Journal of Dispersion Science and Technology** 2001, 22, 485-489. <http://www.tandfonline.com/doi/full/10.1081/DIS-100107857>

E. Patents

- 1) N. S. Lewis, J. A. Beardslee, B. Sadtler “Method for Alignment of Microwires.” January 24, 2017, U.S. Patent # 9553223

F. Media Coverage

The Ampersand (Washington University in St. Louis): Ashlynn Berry tackles the chemistry of green energy, written by Chris Woolston, October 23rd, 2023.

<https://artsci.wustl.edu/ampersand/ashlynn-berry-tackles-chemistry-green-energy>

The Ampersand (Washington University in St. Louis): An alternate route to semiconductor production, written by Shawn Ballard, November 9th, 2022.

<https://artsci.wustl.edu/ampersand/alternate-route-semiconductor-production>

The Ampersand (Washington University in St. Louis): Sadtler lab opens sash for high school teacher, written by Chris Sellers, August 25th, 2022. <https://chemistry.wustl.edu/news/sadtler-lab-opens-sash-high-school-teacher>

The Record (Washington University in St. Louis): ISP helps teachers bring university research to life in classrooms, written by Myra Lopez, August 27th, 2021.

<https://schoolpartnership.wustl.edu/isp-helps-teachers-bring-university-research-to-life-in-classrooms/>

Scientific American: Scientists Sculpt Nanoparticle Shells with Light, written by Leto Sapunar, March 1st, 2020. <https://www.scientificamerican.com/article/scientists-sculpt-nanoparticle-shells-with-light/>

The Source (Washington University in St. Louis): Walking the wire: Real-time imaging helps reveal active sites of photocatalysts, written by Talia Ogliore, February 18th, 2020.

<https://source.wustl.edu/2020/02/walking-the-wire-real-time-imaging-helps-reveal-active-sites-of-photocatalysts/>

The Source (Washington University in St. Louis): Sadtler wins NSF CAREER award to develop better catalysts for alternative fuels, written by Talia Ogliore, March 29th, 2018.

<https://source.wustl.edu/2018/03/sadtler-wins-nsf-career-award-to-develop-better-catalysts-for-alternative-fuels/>

G. Seminars and Conference Presentations

Invited talks

- 34) **American Chemical Society, National Meeting**, Indianapolis, IN, “Spontaneous Seed Formation During Electrodeposition Drives Epitaxial Growth of Metastable Bismuth Selenide Microcrystals.” March 28th, 2023.
- 33) **University of Missouri, Columbia**, Department of Physics, Columbia, MO, “Nanoscale Imaging of Catalytic Activity in Semiconductor Nanostructures using Super-Molecule Fluorescence Microscopy.” March 15th, 2023.
- 32) **2022 Boussett Lecture at Louisiana State University**, Department of Chemistry, Baton Rouge, LA, “Nanoscale Imaging of Catalytic Activity in Semiconductor Nanostructures using Super-Molecule Fluorescence Microscopy.” September 30th, 2022.

- 31) **Southern Illinois University Carbondale**, School of Chemical & Biomolecular Sciences, Carbondale, IL, "Nanoscale Imaging of Catalytic Activity in Semiconductor Nanostructures using Super-Molecule Fluorescence Microscopy." April 29th, 2022.
- 30) **Nanyang Technological University** (virtual seminar), Division of Chemistry & Biological Chemistry, "Using Single-Molecule Imaging to Probe the Role of Oxygen Vacancies in Semiconductor Photocatalysis." January 14th, 2022.
- 29) Virtual conference on Probing Chemical Reactions by Single-Molecule Spectroscopy, "Using Single-Molecule Imaging to Probe the Role of Oxygen Vacancies in Semiconductor Photocatalysis." June 8th, 2021.
- 28) **Washington University in St. Louis**, Department of Energy, Environmental & Chemical Engineering, St. Louis, MO, "Nanoscale Imaging of Catalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." February 5th, 2021.
- 27) **University of Washington, Seattle**, Department of Chemistry, Seattle, WA, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." March 3rd, 2020.
- 26) **University of California, Irvine**, Department of Chemistry, Irvine, CA, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." November 12th, 2019.
- 25) **University of Colorado, Boulder**, Department of Chemistry, Boulder, CO, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." November 8th, 2019.
- 24) **Colorado State University**, Department of Chemistry, Fort Collins, CO, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." November 6th, 2019.
- 23) **University of Texas, Austin**, Department of Chemistry, Austin, TX, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." October 30th, 2019.
- 22) **Texas A&M University**, Department of Chemistry, College Station, TX, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." October 29th, 2019.
- 21) **American Chemical Society MidWest Regional Meeting**, Wichita, KS, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." October 18th, 2019.
- 20) **Vanderbilt University**, Department of Chemistry, Nashville, TN, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." October 14th, 2019.
- 19) **University of Wisconsin, Madison**, Department of Chemistry, Madison, WI, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." October 3rd, 2019.
- 18) **University of California, Riverside**, Department of Chemistry, Riverside, CA, "Nanoscale Imaging of Photocatalytic Activity in Semiconductor Nanostructures using Super-Resolution Fluorescence Microscopy." September 30th, 2019.
- 17) **American Chemical Society National Meeting**, San Diego, CA, "Nanoscale Imaging of Chemical Reactivity in Tungsten Oxide Nanowires using Single-Molecule Fluorescence Microscopy." August 28th, 2019.
- 16) **Indiana State University**, Department of Chemistry and Physics, Terre Haute, IN, "Nanoscale Imaging of Chemical Reactivity using Single-Particle Fluorescence Microscopy." April 23rd, 2019.

- 15) **Washington University**, Department of Chemistry, St. Louis, MO, “Nanoscale Imaging of Chemical Reactivity using Single-Particle Fluorescence Microscopy.” April 18th, 2019.
- 14) **Purdue University**, Department of Chemistry, West Lafayette, IN, “Nanoscale Imaging of Chemical Reactivity using Single-Particle Fluorescence Microscopy.” April 16th, 2019.
- 13) **University of Michigan**, Department of Chemistry, Ann Arbor, MI, “Nanoscale Imaging of Chemical Reactivity using Single-Molecule Fluorescence Microscopy.” April 11th, 2019.
- 12) **University of Missouri, St. Louis**, Department of Chemistry, St. Louis, MO “Nanoscale Imaging of Chemical Reactivity using Single-Molecule Fluorescence Microscopy.” February 25th, 2019.
- 11) **American Chemical Society, National Meeting**, Boston, MA, “Watching Single Nanocrystal Transformations with Fluorescence Microscopy.” August 22nd, 2018.
- 10) **Temple University**, Department of Chemistry, Philadelphia, PA “Semiconductor Photocatalysts for Methane to Methanol Conversion.” March 1st, 2018.
- 9) **Fudan University**, Shanghai, China, “Photocatalytic Methane Conversion using Morphology-Controlled Semiconductor Microcrystals.” June 8th, 2017.
- 8) **Nanjing University**, Nanjing, China, “Photocatalytic Methane Conversion using Morphology-Controlled Semiconductor Microcrystals.” June 6th, 2017.
- 7) **Hong Kong University of Science & Technology**, Applied Environmental Nanotechnology Workshop, Hong Kong, China “Photocatalytic Methane Conversion using Morphology-Controlled Semiconductor Microcrystals.” June 2nd, 2017.
- 6) **Union University**, Department of Chemistry, Jackson, TN, “Solar Fuel Generation using Shape-Controlled Semiconductor Crystals.” April 7th, 2017.
- 5) **University of Arkansas**, Department of Chemistry & Biochemistry, Fayetteville, AR, “Photocatalytic Methane to Methanol Conversion using Shape-Controlled Semiconductor Microcrystals.” March 27th, 2017.
- 4) **Truman State University**, Department of Chemistry, Kirksville, MO, “Synthesis and Shape Control of Semiconductor Photocatalysts for Solar Fuel Generation.” August 26th, 2016.
- 3) **American Chemical Society National Meeting**, San Diego, CA, “Solid-State Chemistry of Ternary Metal Halide Nanocrystals.” March 13th, 2016.
- 2) **Saint Louis University**, Department of Chemistry, Saint Louis, MO, “Light-Driven Growth of Phototropic, Inorganic Nanostructures.” January 23rd, 2015.
- 1) **Washington University**, Institute of Materials Science & Engineering, Saint Louis, MO, “Design of Complex, 3D Mesostructures through Light-Directed Growth of Inorganic Films.” October 3rd, 2014.

Contributed talks and poster presentations

- 6) **Gordon Research Conference on Electrochemistry**, “Single-Molecule Imaging of Heterogeneous Charge Transfer in Metal Oxide Nanostructures.” Ventura, CA, September 11th – 16th, 2022 (*Poster presentation*).
- 5) **Gordon Research Conference on Colloidal Semiconductor Nanocrystals**, “Facet-Dependent Activity in the Photocatalytic Conversion of Methane to Methanol using Bismuth Vanadate Microcrystals.” Bryant University, Smithfield, RI, July 15th – 20th, 2018 (*Poster presentation and discussion leader*).

- 4) **American Chemical Society National Meeting**, Washington D. C., “Photocatalytic Methane Conversion using Shape-Controlled Semiconductor Microcrystals.” August 20th, 2017 (*Contributed talk*).
- 3) **American Chemical Society National Meeting**, Washington D. C., “Compositionally Induced Twin Defects Control the Shape of Ternary Silver Halide Nanocrystals.” August 24th, 2017 (*Contributed talk*).
- 2) **Gordon Research Conference on Colloidal Semiconductor Nanocrystals**, “Solid-State Chemistry and Photocatalytic Activity of Metal Halide Nanocrystals.” West Dover, VT, July 31st – August 5th, 2016 (*Poster presentation*).
- 1) **Gordon Research Conference on Solar Fuels**, “Solid-State Chemistry of Ternary Silver Halide Nanocrystals for Photocatalytic CO₂ Conversion.” Lucca, Italy, February 28th – March 4th, 2016 (*Poster presentation*).

H. Students Mentored and Thesis Committees

Current graduate students & research area

- Matthew Dake (1st year, Chemistry) – synthesis of chiral semiconductors
- William Rackers (4th year, Chemistry) – single-molecule imaging of photocatalysis
- Ashlynn Berry (4th year, Chemistry) – electrodeposition and electrocatalysis

Previous graduate students & postdocs

- Dr. Jiang Luo – PhD in Chemistry awarded May 2024, currently a Postdoctoral Appointee at Argonne National Laboratory
- Dr. Dongyan Zhang – PhD in Chemistry awarded May 2023, currently at TDK Headway Technologies, Inc.
- Dr. Dong Wang – PhD in Chemistry awarded January 2022, currently at Applied Materials, Inc.
- Dr. Che Tan – PhD in Energy, Environmental & Chemical Engineering awarded December 2021, currently at Intel Corporation
- Dr. Meikun Shen – PhD in Chemistry awarded February 2021, starting as an Assistant Professor at Jacksonville State University in Fall 2024
- Dr. Chu Qin – PhD in Chemistry awarded January 2021, currently an Assistant Professor in the Department of Physics at Zhejiang Sci-Tech University
- Dr. Bo Yin – PhD in Materials Science & Engineering awarded May 2019, currently a Senior Process Engineer at ASM America, Inc.
- Dr. Wenlei Zhu – postdoctoral researcher, September 2015 – July 2017, currently the Jiangsu Distinguished Professor in the School of the Environment at Nanjing University

Current undergraduate student researchers

- Emmy Morin (3rd year chemistry major)
- Zach Ben-Meir (1st year chemistry major)

Previous undergraduate student researchers

- Julie Lampert – A. B. in Chemistry, May 2024, starting PhD program in Chemistry at Yale University in Fall 2024
- Shantiv Sudarshan – A.B. in Chemistry, May 2023, currently in Master’s program in Materials Science & Engineering at the University of Illinois, Urbana-Champaign

- Xinyi Sarah Wu – A. B. in Chemistry, May 2022, currently in PhD program in Chemistry at the University of Texas, Austin
- Brandon M. Campbell – A. B. in Chemistry, May 2021, Barry M. Goldwater Scholar and NSF Graduate Fellowships Research Program awardee, currently in PhD program in Chemistry at Harvard University
- Logan Brennan – A. B. in Chemistry, May 2020, currently in PhD program in Chemistry at the University of California, Irvine)
- Byung Ha A. B. in Physics, May 2022
- Ashton Barber – A. B. in Chemistry, December 2020, currently in PhD program in Neuroscience at the University of Wisconsin, Madison
- Khalid Mahmood – A. B. in Chemistry, May 2020, currently in PhD program in Chemistry at the University of California, Berkeley
- Andrew Novick – A. B. in Chemistry, May 2018, currently in PhD program in Materials Science & Engineering at the Colorado School of Mines
- Daniel Khan – B. S. in Biomedical Engineering, May 2018, currently in M.D. program at the Mayo Clinic Alix School of Medicine
- Christina Krucylak – A. B. in Chemistry, May 2018, currently in M.D. program at Washington University in St. Louis
- Avi Grinberg – A. B. in Chemistry 2018, M.S. in Electrochemical Technology from the University of Oregon
- Craig Laing – A. B. in Chemistry, May 2017, recently finished PhD program in Chemistry from Northwestern University
- Wendy Lu – A. B. in Anthropology & Women, Gender and Sexuality Studies, May 2018
- Alicia Yang – A. B. from Washington University, May 2018

Thesis defenses and proposal committees:

- Current thesis advisory committee member for Chemistry (5 students)
- Current thesis advisory committee member for Engineering (1 student)
- PhD thesis defense committee member for Chemistry (17 students)
- PhD thesis defense committee member for Engineering (16 students)
- Master's thesis defense committee member for Engineering (3 students)
- PhD thesis defense committee member for Physics (2 students)

I. Courses Taught at Washington University

number of students enrolled each semester in parentheses

- CHEM 111A: General Chemistry: Fall 2018 (132), Fall 2017 (131)
- CHEM 465: Solid-State and Materials Chemistry: Fall 2023 (26), Fall 2021 (8), Spring 2021 (11), Spring 2020 (17), Fall 2016 (24), Fall 2015 (18), Fall 2014 (22)
- CHEM 426: Inorganic Electrochemistry and Photochemistry: Fall 2020 (6), Spring 2019 (9), Spring 2018 (12), Spring 2017 (16)
- Chem 470: Inorganic Laboratory: Spring 2024 (20), Spring 2023 (6), Spring 2022 (7)
- Chem 461: Inorganic Chemistry: Fall 2022 (40)
- Chem 540: Inorganic/Organometallic Chemistry Seminar: Spring 2024 (1)

J. Departmental and University Service

- 08/2022 – present Faculty search committee, Dept. of Chemistry – review applications and interview applicants for faculty positions in Chemistry
- 03/2021 – 07/2022 Steering committee, Dept. of Chemistry – member of committee to develop steering plan for the next 10 years of the department
- 12/2014 – 07/2022 Graduate admissions committee, Dept. of Chemistry – review applications for admissions to PhD program and recruit admitted students
- 01/2016 – 05/2019 Seminar coordinator, Dept. of Chemistry – coordinated the invitation and scheduling of speakers for the department's weekly seminar series
- 09/2017 – 07/2022 Department website committee, Dept. of Chemistry – member of committee to revamp the department's website
- 04/2021 – present Facilities committee, Institute of Materials Science & Engineering (IMSE) – member of committee to develop plans for the acquisition of new user equipment and management of current equipment for the IMSE
- 01/2017 – 07/2021 Education committee, Institute of Materials Science & Engineering (IMSE) – serve on admissions committee for the IMSE PhD program and approve changes to program curriculum and requirements
- 08/2015 – 04/2016 Faculty search committee, Energy, Environmental & Chemical Engineering (EECE)
- 06/2021 – 07/2021 Internal review panelist to provide feedback for assistant professors in A&S at WashU who are applying for NSF CAREER awards
- 01/2015 – present Mentoring of 16 undergraduate students and 3 high school students in laboratory research

K. Professional Activities & Public Engagement

- Reviewer for ACS Catalysis, ACS Energy Letters, ACS Nano, ACS Nanoscience Au, ACS Omega, Accounts of Chemical Research, Chemical Communications, Chemical Science, Chemistry of Materials, Inorganic Chemistry, Journal of the American Chemical Society, Nano Letters, Nanoscale, The Journal of Physical Chemistry, Journal of Materials Chemistry, Nature Communications, Nature Photonics, Nature Sustainability, Nature Synthesis, Proceedings of the National Academy of Sciences USA, Science, and Scientific Reports.
- Member of review panel for the National Science Foundation, Spring 2019.
- Discussion leader at the Gordon Research Conference on Colloidal Semiconductor Nanocrystals, July 15th, 2018, Bryant University, Smithfield, RI.
- Developed and led workshops for high school teachers in the St. Louis region to integrate solid-state chemistry and computer models in high school chemistry, June 18th, 2019; June 22nd, 2017; and July 8th, 2016, St. Louis, MO.
- Science outreach at Maplewood Richmond Heights High School and Kirkwood High School. Developed and taught lectures on Periodic chemical trends using computer models of inorganic crystals, 2018 – 2022.