Curriculum Vitae

William A. Tisdale

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Education

2010-2011	Postdoc, Research Laboratory of Electronics, MIT, Cambridge, MA.
2005-2010	Ph.D., Chemical Engineering, University of Minnesota, Minneapolis, MN.
2001-2005	B.ChE., Chemical Engineering, University of Delaware, Newark, DE
	Honors, with Distinction, Magna Cum Laude.

Professional Appointments

2023-	Professor, Department of Chemical Engineering,
	Massachusetts Institute of Technology, Cambridge, MA.
2023-2024	Visiting Scholar, Rowland Institute, Faculty of Arts and Sciences,
	Harvard University, Cambridge, MA.
2019-2023	Associate Professor, with Tenure, Department of Chemical Engineering,
	Massachusetts Institute of Technology, Cambridge, MA.
2017-2019	Associate Professor, without Tenure, ARCO Career Development Chair, Department
	of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA.
2012-2017	Assistant Professor, Charles & Hilda Roddey Career Development Chair, Department
	of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA.
2010-2011	Postdoctoral Associate with Prof. Vladimir Bulović, Research Laboratory of
	Electronics, Massachusetts Institute of Technology, Cambridge, MA.
2005-2010	Graduate Research Assistant with Profs. Xiaoyang Zhu, David Norris, and Eray Aydil,
	University of Minnesota, Minneapolis, MN.

Honors and Awards

- 2023 Bose Award for Excellence in Teaching
- 2023 C. Michael Mohr Undergraduate Teaching Award
- 2022 C. Michael Mohr Undergraduate Teaching Award
- 2021 C. Michael Mohr Undergraduate Teaching Award
- 2020 <u>MacVicar Faculty Fellow</u>
- 2019 C. Michael Mohr Undergraduate Teaching Award
- 2018 AIChE Delaware Valley Section Outstanding Alumni Award
- 2017 C. Michael Mohr Undergraduate Teaching Award
- 2017 AIChE Nanoparticle Science & Engineering Forum Young Investigator Award

2017	Camille Dreyfus Teacher-Scholar Award
2016	Presidential Early Career Award for Scientists and Engineers (PECASE)
2016	Alfred P. Sloan Fellowship
2015	NSF CAREER Award
2015	C. Michael Mohr Undergraduate Teaching Award
2014	Everett Moore Baker Award for Excellence in Undergraduate Teaching
2014	3M Non-Tenured Faculty Award
2013	DOE Office of Science Early Career Award

Teaching

- 2019-202310.213 Thermodynamics. Average Instructor Rating 6.8/7.0Led redesign of curriculum for sophomore year thermodynamics subject in
Chemical Engineering at MIT.
 - Selected student comments:
 - *"The best professor I've ever had. Super engaging, highly knowledgeable, and was so easily able to explain complex concepts in simple terms."*
 - "Tisdale is by far one of the best, most personable professors I've had at MIT. He explains concepts so well and is very interactive with the class."
 - $\circ~$ "Best professor at MIT. Not much else to say."
- 2021-2022 <u>10.UAR Individual Laboratory Experience</u>. *Average Instructor Rating* **7.0/7.0** New subject offering to augment undergraduate research experience at MIT.
- 2012-2014, <u>10.302 Transport Phenomena</u>. Average Instructor Rating **6.8/7.0**
- 2016-2017, Junior-level chemical engineering core lecture subject in heat & mass transfer.
- 2020, 2022 Selected student comments:
 - "Literally the greatest teacher I have had in my 15 years of schooling."
 - *"Amazing lecturer who always makes the subject interesting. If I could have Prof. Tisdale for every single ChemE class, I would."*
 - "Favorite professor I've had my entire time at MIT. Very good at explaining content in an interesting and clear way and very good at organizing boards/notes. Very good at interpreting and answering questions and making sure you actually understand the answer. I wish he taught more classes in course 10 so I could take them."
- 2012-2018 <u>10.27 Energy Projects Lab</u>. *Average Instructor Rating* **6.8/7.0** Junior/Senior-level chemical engineering laboratory subject.
 - Created 7 new semester-long projects, including:
 - Hybrid Organic-Inorganic Perovskite Nanoplatelets: Advanced Materials for Next-Generation Optoelectronic Technologies
 - Optimization of an Organic Solar Cell
 - Engineering Quantum-Dot Materials for Energy-Efficient Lighting
 - Heat Transport in Nanostructured Materials

2015	<u>10.51 – Nanoscale Energy Transport Processes</u> . <i>Average Instructor Rating</i> 6.7/7.0 Newly developed graduate elective subject.
Department	and Institute Service
2022-2026	Graduate Admissions Chair, Department of Chemical Engineering
2022-2024	MIT Committee on the Undergraduate Program (CUP)
2021	MIT Task Force 2021 and Beyond – Grad Student Funding Refinement and Implementation Committee (RIC15)
2020-2022	Subcommittee on the Communications Requirement (SOCR) – School of Engineering Representative
2020-2021	First Year Advising Seminar Leader (10.A14)
2019-	Institute Faculty Meeting Representative – Chemical Engineering
2019-2021	NEET "Renewable Energy Machines" thread leadership team
2019-2020	MIT "Preparing Future Faculty" Workshop Organizer
2018-2019	Member, NEET "Renewable Energy Machines" ad hoc advisory committee
2018-2019	Led renewal of MIT ChemE undergraduate thermodynamics sequence
2018-	Faculty Host, MIT First-Year Student Lunch Series
2018-2024	Faculty Advisor, MIT Everett Moore Baker Memorial Foundation Advisory Board
2017-2019	Member, MIT Chemical Engineering Undergraduate Curriculum Task Force
	- Chair, Transport Sequence focus group
2016-	Member, ChemE Graduate Program Committee
2015-	Member, ChemE Undergraduate Program Committee
2014-2018	Member, Steering Committee, EFRC Center for Excitonics
2013-	ChemE undergraduate advisor
2013-2016	Chemical Engineering seminar series coordinator

2012- ChemE graduate admissions committee

Outreach

2012-2023	Supervised >25 undergraduate student researchers
2018-	Faculty Host and Discussion Leader, MIT "Rising Stars" workshop for aspiring women faculty
2013-	Faculty Advisor, MIT ACCESS Program for students from underrepresented groups
	considering graduate school in Chemistry, Chemical Engineering, and Materials
	Science
2020	DOE Early Career Network – Career Panelist
2014	Hosted 55 6th graders from a Boston Public School in an underserved community at
	MIT for a day of exposure to scientific research. Students performed a hands-on lab
	activity and toured campus destinations.
2014	Hosted local community college student for summer research experience.
2012	Hosted local middle school science teacher for summer research experience.
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Scientific Leadership

2021	General Organizer, nanoGe Spring Meeting [virtual]
2020	General Organizer, <i>E</i> ₃ <i>S: Exciton Engineering in Emerging Semiconductors</i> , Madrid,
	Spain
2019	NSF MRSEC site visit team, University of Pennsylvania
2018-2019	Member, AIChE NSEF Awards Committee
2015-2018	Member, Steering Committee, EFRC Center for Excitonics
2012-	Programming Advisor, Session Chair, Area 8E (MESD, AIChE)
2016	Discussion Leader, Gordon Research Conference on Quantum Dots, Mt. Snow, VT
2014	Discussion Leader, Gordon Research Conference on Quantum Dots, Smithfield, RI
2013	Symposium Organizer; MRS Spring Meeting, San Francisco, CA

Supervised PhD Theses

In progress	
2020-	Narumi Wong, Chemical Engineering, MIT, PhD
2020-	Woo Seok Lee, Materials Science & Engineering, MIT, PhD
2021-	Eliza Price, Chemical Engineering, MIT, PhD
2021-	Thomas Sheehan, Chemical Engineering, MIT, PhD
2021-	Niamh Brown, Physical Chemistry, MIT, PhD
2022-	Nick Samulewicz, Chemical Engineering, MIT, PhD
2022-	Maya Chattoraj, Inorganic Chemistry, MIT, PhD

Completed

2016	A. Jolene Mork, Physical Chemistry, MIT, PhD
2016	Mark Weidman, Chemical Engineering, MIT, PhD
2017	Rachel Gilmore, Chemical Engineering, MIT, PhD
2018	Aaron Goodman, Physical Chemistry, MIT, PhD
2018	Elizabeth M. Y. Lee, Chemical Engineering, MIT, PhD
2019	Nabeel Dahod, Chemical Engineering, MIT, PhD
2019	Matthew Ashner, Chemical Engineering, MIT, PhD
2019	Katherine Shulenberger, Physical Chemistry, MIT, PhD
2020	Sam Winslow, Chemical Engineering, MIT, PhD
2021	Seung Kyun Ha, Chemical Engineering, MIT, PhD
2021	Watcharaphol "Oat" Paritmongkol, Physical Chemistry, MIT, PhD
2022	Wenbi Shcherbakov-Wu, Physical Chemistry, MIT, PhD
2022	Eric Powers, Chemical Engineering, MIT, PhD
2023	Ruomeng Wan, Inorganic Chemistry, MIT, PhD

Supervised Master's Theses

In progress	
2023	Tejas Deshpande, ETH, Zurich (MS thesis research performed at MIT)

Completed

2013	Lisa Poulikakos, ETH, Zurich (MS thesis research performed at MIT)
2015	Robert Keitel, ETH, Zurich (MS thesis research performed at MIT)
2016	Michael Seitz, ETH, Zurich (MS thesis research performed at MIT)
2017	Leo Spiegel, ETH, Zurich (MS thesis research performed at MIT)
2017	Deepankur Thureja, ETH, Zurich (MS thesis research performed at MIT)
2018	Alexia Stollmann, ETH, Zurich (MS thesis research performed at MIT)
2019	Alex Hernandez-Oendra, ETH, Zurich (MS thesis research performed at MIT)
2022	Abigail Taussig, Chemical Engineering, MIT, S.M.

Supervised Postdoctoral Associates

Nannan Mao, PhD, Physical Chemistry – Peking University, China
Chana Honick, PhD, Physical Chemistry – Johns Hopkins University
Seryio Saris, PhD, Materials Chemistry – EPFL Lausanne, Switzerland

Completed

2012-2014	Ferry Prins, Current position: Assistant Professor, IFIMAC, Autonoma de Madrid
2014-2015	Pooja Tyagi, Current position: unknown
2015-2016	Dan Congreve, Current position: Assistant Professor, Stanford University
2014-2017	Yunan Gao, Current position: Assistant Professor, Applied Physics, Peking University
2017-2019	Catherine Mauck, Current position: Assistant Professor, Chemistry, Kenyon College
2018-2019	Dahin Kim, Current position: Postdoc, University of Pennsylvania
2017-2020	Kristopher Williams, Current position: unknown

Visiting Scientists

2020-2022	Tomoaki Sakurada, AGC Chemical Company, Japan
2018	Makhsud Saidaminov, University of Toronto, Canada

Patents

- 6. "Metal Organic Chalcogenolates;" W. Paritmongkol, T. Sakurada, <u>W.A. Tisdale</u>; *pending* (2021).
- 5. "Nonlinear optical imaging;" Y. Gao, A.J. Goodman, <u>W.A. Tisdale</u>; US 10,855,046 (2020).
- 4. "Tunable light emitting diodes utilizing quantum-confined layered perovskite emitters;" D.N. Congreve,
 M. Seitz, M.C. Weidman, <u>W.A. Tisdale</u>; US 10,825,996 (2020).
- 3. "Highly tunable colloidal perovskite nanoplatelets;" M.C. Weidman, M. Seitz, <u>W. A. Tisdale</u>; US 10,273,405 (2019).
- 2. "Nanocrystal synthesis;" M.C. Weidman, M.E. Beck, F. Prins, <u>W. A. Tisdale</u>; US 9,481,582 (2016).

1. "Device and method for luminescence enhancement by resonant energy transfer from an absorptive thin film," G.M. Akselrod, M.G. Bawendi, V. Bulović, J.R. Tischler, <u>W.A. Tisdale</u>, B.J. Walker; US 8,908,261 (2014).

Publications - see https://tisdalelab.mit.edu/publications/ for continuously updated list

Publications as an independent PI:

- XX. "Persistent Enhancement of Exciton Diffusivity in CsPbBr₃ Nanocrystal Solids"
 W. Shcherbakov-Wu, S. Saris, T. Sheehan, N.N. Wong, E.R. Powers, F. Krieg, M.V. Kovalenko, A.P. Willard, <u>W.A. Tisdale</u> *arXiv* 2209.14412.
- "Dipole-Dependent Waveguiding in an Anisotropic Metal-Organic Framework" R. Wan, D. Mankus, W.S. Lee, A.K.R. Lytton-Jean, <u>W.A. Tisdale</u>, M. Dincă *J. Am. Chem. Soc.* 10.1021/jacs.3c06678 (2023).
- 94. "Discovery of enhanced lattice dynamics in a single-layered hybrid perovskite"
 Z. Zhang, J. Zhang, Z.-J. Liu, N.S. Dahod, W. Paritmongkol, N. Brown, A. Stollmann, W.S. Lee, Y.-C. Chien, Z. Dai, K.A. Nelson, <u>W.A. Tisdale</u>, A.M. Rappe, E. Baldini *Science Adv.* 9, eadg4417 (2023).
- 93. "Exciton Fine Structure in 2D Perovskites: The Out-of-Plane Excitonic State"
 K. Posmyk, M. Dyksik, A. Surrente, D.K. Maude, N. Zawadzka, A. Babiński, M.R. Molas, W. Paritmongkol, M. Mączka, <u>W.A. Tisdale</u>, P. Plochocka, M. Baranowski *Adv. Opt. Mater.* 2300877 (2023).
- "Giant Nonlinear Optical Response *via* Coherent Stacking of in-Plane Ferroelectric Layers"
 N. Mao, Y. Luo, M.-H. Chiu, C. Shi, X. Ji, T.S. Pieshkov, Y. Lin, H.-L. Tang, A.J. Akey, J.A. Gardener, J.-H. Park,
 V. Tung, X. Ling, X. Qian, W.L. Wilson, Y. Han, <u>W.A. Tisdale</u>, J. Kong *Adv. Mater.* 2210894 (2023).
- 91. "Fine Structure Splitting of Phonon-Assisted Excitonic Transition in (PEA)₂PbI₄ Two-Dimensional Perovskites"
 K. Posmyk, M. Dyksik, A. Surrente, K. Zalewska, M. Smiertka, E. Cybula, W. Paritmongkol, <u>W.A. Tisdale</u>, P. Plochocka, M. Baranowski *Nanomaterials* 13, 1119 (2023).
- 90. "1D Hybrid Semiconductor Silver 2,6-difluorophenylselenolate"
 T. Sakurada, Y. Cho, W. Paritmongkol, W.S. Lee, R. Wan, A. Su, W. Shcherbakov-Wu, P. Müller, H.J. Kulik, <u>W.A. Tisdale</u>
 J. Am. Chem. Soc. 145, 5183-5190 (2023).
- 89. "Lead Halide Perovskite Nanocrystals with Low Inhomogeneous Broadening and High Coherent Fraction through Dicationic Ligand Engineering"
 M. Ginterseder, W. Sun, W. Shcherbakov-Wu, A.R. McIsaac, D.B. Berkinsky, A.E.K. Kaplan, L. Wang, C. Krajewska, T. Sverko, C.F. Perkinson, H. Utzat, <u>W.A. Tisdale</u>, T. van Voorhis, M.G. Bawendi Nano Letters 23, 1128-1134 (2023).
- 88. "Nanocrystal Phononics"
 M. Jansen, <u>W.A. Tisdale</u>, V. Wood *Nature Materials* 22, 161-169 (2023).

- 87. "Light Emission in 2D Silver Phenylchalcogenolates"
 W.S. Lee, Y. Cho, E.R. Powers, W. Paritmongkol, T. Sakurada, H.J. Kulik, <u>W.A. Tisdale</u> ACS Nano 16, 20318–20328 (2022).
- 86. "Uniaxial Strain Engineering *via* Core Position Control in CdSe/CdS Core/Shell Nanorods and Their Optical Response"
 D. Kim, W. Shcherbakov-Wu, S.K. Ha, W.S. Lee, <u>W.A. Tisdale</u> ACS Nano 16, 14713-14722 (2022).
- "Robust estimation of charge carrier diffusivity using transient photoluminescence microscopy" N.N. Wong, S.K. Ha, K. Williams, W. Shcherbakov-Wu, J.W. Swan, <u>W.A. Tisdale</u> *J. Chem. Phys.* 157, 104201 (2022).
- 84. "Dipole-mediated exciton management strategy enabled by reticular chemistry"
 R. Wan, D.-G. Ha, J.-H. Dou, W.S. Lee, T. Chen, J.J. Oppenheim, J. Li, <u>W.A. Tisdale*</u>, M. Dincă*
 Chem. Sci. 10.1039/D2SC01127A (2022).
- 83. "Prediction of PbS Nanocrystal Superlattice Structure with Large-Scale Patchy Particle Simulations" S.W. Winslow, <u>W.A. Tisdale*</u>, J.W. Swan*
 J. Phys. Chem. C 126, 14264-14274 (2022).
- 82. "Quantification of exciton fine structure splitting in a two-dimensional perovskite compound"
 K. Posmyk, N. Zawadzka, Mateusz Dyksik, A. Surrente, D.K. Maude, T. Kazimierczuk, A. Babinski, M.R. Molas, W. Paritmongkol, M. Maczka, <u>W.A. Tisdale</u>, Paulina Plochocka, M. Baranowski *J. Phys. Chem. Lett.* 13, 4463-4469 (2022).
- "Busting through quantum dot barriers" N.S. Ginsberg & <u>W.A. Tisdale</u> *Nature Materials* 21, 497-499 (2022).
- "Super-resolved Second Harmonic Generation Imaging by Coherent Image Scanning Microscopy" D. Raanan, M.S. Song, <u>W.A. Tisdale</u>, D. Oron *Appl. Phys. Lett.* 120, 071111 (2022).
- "Morphological Control of 2D Hybrid Organic-Inorganic Semiconductor AgSePh"
 W. Paritmongkol, W.S. Lee, W. Shcherbakov-Wu, S.K. Ha, T. Sakurada, S.J. Oh, <u>W.A. Tisdale</u>
 ACS Nano 16, 2054-2065 (2022).
- "Healing of donor defect states in monolayer molybdenum disulfide using oxygen-incorporated chemical vapour deposition"
 P.C. Shen, Y. Lin, C. Su, C. McGahan, A.Y. Lu, X. Ji, X. Wang, H. Wang, N. Mao, Y. Guo, J.H. Park, Y. Wang, <u>W.A. Tisdale</u>, J. Li, X. Ling, K.E. Aidala, T. Palacios, J. Kong *Nature Electronics* 5, 28-36 (2022).
- 77. "Size and Quality Enhancement of 2D Semiconducting Metal Organic Chalcogenolates by Amine Addition"
 W. Paritmongkol, T. Sakurada, W.S. Lee, R. Wan, P. Müller, <u>W.A. Tisdale</u> *J. Am. Chem. Soc.* 143, 20256-20263 (2021).
- 76. "Power-Dependent Photoluminescence Efficiency in Manganese-Doped 2D Hybrid Perovskite Nanoplatelets"
 S.K. Ha, W. Shcherbakov-Wu, E.R. Powers, W. Paritmongkol, <u>W.A. Tisdale</u>
 ACS Nano 15, 20527-20538 (2021).

- 75. "Revealing the Brønsted-Evans-Polanyi Relation in Halide-Activated Fast MoS₂ Growth Towards Millimeter-Sized 2D Crystals"
 Q. Ji, C. Su, N. Mao, X. Tian, J.-C. Idrobo, J. Miao, <u>W.A. Tisdale</u>, A. Zettl, J. Li, J. Kong *Science Adv.* 7, eabj3274 (2021).
- 74. "Temperature-Independent Dielectric Constant in CsPbBr₃ Nanocrystals Revealed by Linear Absorption Spectroscopy"
 W. Shcherbakov-Wu, P.C. Sercel*, F. Krieg, M.V. Kovalenko, <u>W.A. Tisdale</u>*
 J. Phys. Chem. Lett. 12, 8088-8095 (2021).
- 73. "State of the Art and Prospects for Halide Perovskite Nanocrystals" A. Dey *et al.* (*multi-author review*) *ACS Nano.* 15, 10775-10981 (2021).
- "Resonance-Enhanced Excitation of Interlayer Vibrations in Atomically-Thin Black Phosphorous"
 N. Mao, Y. Lin, Y.-Q. Bie, T. Palacios, L. Liang, R. Saito, X. Ling, J. Kong,* <u>W.A. Tisdale</u>,*
 Nano. Lett. 21, 4809-4815 (2021).
- "Repulsive, Densely Packed Ligand-Shells Mediate Interactions between PbS Nanocrystals in Solution"
 S.W. Winslow, Y. Liu, J.W. Swan,* <u>W.A. Tisdale</u>;*
 J. Phys. Chem. C. 125, 8014-8020 (2021).
- "Colloidal Nano-MOFs Nucleate and Stabilize Ultra-Small Quantum Dots of Lead Bromide Perovskites"
 L. Protesescu, J. Calbo, K. Williams, <u>W.A. Tisdale</u>, A. Walsh, M. Dinca;
 Chem. Sci. 12, 6129-6135 (2021).
- 69. "Tuning the Excitonic Properties of the 2D (PEA)₂(MA)_{n-1}Pb_nI_{3n+1} Perovskite Family *via* Quantum Confinement"
 M. Dyksik, S. Wang, W. Paritmongkol, D.K. Maude, <u>W.A. Tisdale</u>,* M. Baranowski,* P. Plochocka;* *J. Phys. Chem. Lett.* 12, 1638-1643 (2021).
- 68. "Unconventional Ferroelectricity in Moiré Heterostructures"
 Z. Zheng, Q. Ma, Z. Bi, S. de la Barrera, M.-H. Liu, N. Mao, Y. Zhang, N. Kiper, K. Watanabe, T. Taniguchi, J. Kong, <u>W.A. Tisdale</u>, R. Ashoori, N. Gedik, L. Fu, S.-Y. Xu, P. Jarillo-Herrero; *Nature* 588, 71-76 (2020).
- 67. "Optimal Loading for Injection" J.W. Swan*, S.W. Winslow, <u>W.A. Tisdale;</u> *AIChE. J.* 66, e17102 (2020).
- 66. "Two Origins of Broadband Emission in Multilayered 2D Lead Iodide Perovskites" W. Paritmongkol, E.R. Powers, N.S. Dahod, <u>W.A. Tisdale;</u> *J. Phys. Chem. Lett.* 11, 8565-8572 (2020).
- 65. "Low-Frequency Raman Spectrum of 2D Layered Perovskites: Local Atomistic Motion or Superlattice Modes?"
 N.S. Dahod, A. France-Lanord, W. Paritmongkol, J.C. Grossman, <u>W.A. Tisdale</u>; *J. Chem. Phys.* 153, 044710 (2020).
- 64. "Tunable Exciton Binding Energy in 2D Hybrid Layered Perovskites through Donor-Acceptor Interactions within the Organic Layer"
 J.V. Passarelli, C.M. Mauck, S.W. Winslow, C.F. Perkinson, J.C. Bard, H. Sai, K.W. Williams, A. Narayanan, D.J. Fairfield, M.P. Hendricks, <u>W.A. Tisdale*</u>, S.I. Stupp*; *Nature Chemistry* 12, 672-682 (2020).

- 63. "Reversible Temperature-Induced Structural Transformations in PbS Nanocrystal Superlattices" S.W. Winslow, D.-M. Smilgies, J.W. Swan,* <u>W.A. Tisdale</u>;* *J. Phys. Chem. C.* 124, 13456-13466 (2020).
- 62. "Substrate-Dependent Exciton Diffusion and Annihilation in Chemically Treated MoS₂ and WS₂" A.J. Goodman, D.H. Lien, G.H. Ahn, L.L. Spiegel, M. Amani, A.P. Willard, A. Javey,* <u>W.A. Tisdale</u>;* *J. Phys. Chem. C* 124, 12175-12184 (2020).
- "The Importance of Unbound Ligand in Nanocrystal Superlattice Formation" S.W. Winslow, J.W. Swan, <u>W.A. Tisdale</u>; *J. Am. Chem. Soc.* 142, 9675-9685 (2020).
- 60. "A Time-Domain View of Charge Carriers in Semiconductor Nanocrystal Solids" W. Shcherbakov-Wu & <u>W.A. Tisdale</u>; *Chem. Sci.* 11, 5157-5167 (2020).
- 59. "Spatially Resolved Photogenerated Exciton and Charge Transport in Emerging Semiconductors" N.S. Ginsberg* & <u>W.A. Tisdale</u>;*
 Ann. Rev. Phys. Chem. 71, 1-30 (2020).
- 58. "Multi-Cation Perovskites Prevent Carrier Reflection from Grain Surfaces"
 M.I. Saidaminov, K. Williams, M. Wei, A. Johnston, R. Quintero-Bermudez, M. Vafaie, J.M. Pina, A.H. Proppe, Y. Hou, G. Walters, S.O. Kelley, <u>W.A. Tisdale*</u>, E.H. Sargent*; *Nature Materials* 19, 412-418 (2020).
- 57. "Direct Observation of Symmetry-Dependent Electron-Phonon Coupling in Black Phosphorous" N. Mao, X. Wang, Y. Lin, B.G. Sumpter, Q. Ji, T. Palacios, S. Huang, V. Meunier, M.S. Dresselhaus, <u>W.A.</u> <u>Tisdale</u>, L. Liang, X. Ling, J. Kong; *J. Am. Chem. Soc.* 141, 18994-19001 (2019).
- 56. "Inorganic Cage Motion Dominates Excited State Dynamics in 2D Layered Perovskites (C_xH_{2x+1}NH₃)₂PbI₄ (x = 4-9)"
 C.M. Mauck, A. France-Lenord, A.C. Hernandez Oendra, N.S. Dahod, J.C. Grossman, <u>W.A. Tisdale</u>; *J. Phys. Chem. C* 123, 27904-27916 (2019).
- 55. "Size-Dependent Biexciton Spectrum in CsPbBr₃ Perovskite Nanocrystals"
 M.N. Ashner, K.E. Shulenberger, F. Krieg, E.R. Powers, M.V. Kovalenko, M.G. Bawendi*, <u>W.A. Tisdale</u>;*
 ACS Energy Lett. 4, 2639-2645 (2019).
- 54. "Facile Synthesis of Colloidal Lead Halide Perovskite Nanoplatelets *via* Ligand-Assisted Reprecipitation"
 S.K. Ha & <u>W.A. Tisdale:</u>
 J. Vis. Exp. 152, e60114 (2019).
- "Setting an Upper Bound to the Exciton Binding Energy in CsPbBr₃ Perovskite Nanocrystals" K.E. Shulenberger, M.N. Ashner, S.K. Ha, F. Krieg, M.V. Kovalenko, <u>W.A. Tisdale</u>,* M.G. Bawendi;* *J. Phys. Chem. Lett.* 10, 5680-5686 (2019).
- 52. "Quantification of a PbCl_x Shell on the Surface of PbS Nanocrystals"
 S.W. Winslow, Y. Liu, J.W. Swan,* <u>W.A. Tisdale</u>;*
 ACS Mater. Lett. 1, 209-216 (2019).

- 51. "Characterization of Colloidal Nanocrystal Surface Structure Using Small Angle Neutron Scattering and Efficient Bayesian Parameter Estimation"
 S.W. Winslow, W. Shcherbakov-Wu, Y. Liu, <u>W.A. Tisdale</u>,* J.W. Swan;*
 J. Chem. Phys. 150, 244702 (2019).
- 50. "Synthetic Variation and Structural Trends in Layered Two-Dimensional Alkylammonium Lead Halide Perovskites"
 W. Paritmongkol, N.S. Dahod, A. Stollmann, N. Mao, C. Settens, S.-L. Zheng, <u>W.A. Tisdale</u>; *Chem. Mater.* 31, 5592-5607 (2019).
- 49. "Epitaxial Dimers and Auger-Assisted Detrapping in PbS Quantum Dot Solids"
 R.H. Gilmore, Y. Liu, W. Shcherbakov-Wu, N.S. Dahod, E.M.Y. Lee, M.C. Weidman, H. Li, J. Jean, V. Bulović, A.P. Willard, J.C. Grossman, <u>W.A. Tisdale</u>; *Matter* 1, 250-265 (2019).
- 48. "Excitons in 2D Organic-Inorganic Halide Perovskites"
 C.M Mauck & <u>W.A. Tisdale;</u> *Trends in Chemistry* 1, 380-393 (2019).
- 47. "Melting Transitions of the Organic Subphase in Layered Two-Dimensional Halide Perovskites" N.S. Dahod, W. Paritmongkol, A. Stollmann, C. Settens, S.-L. Zheng, <u>W.A. Tisdale</u>; *J. Phys. Chem. Lett.* 10, 2924-2930 (2019).
- 46. "Markov Chain Monte Carlo Sampling for Target Analysis of Transient Absorption Spectra" M.N. Ashner, S.W. Winslow, J.W. Swan, <u>W.A. Tisdale</u>; *J. Phys. Chem. A* 123, 3893-3902 (2019).
- 45. "Towards Stable Deep-Blue Luminescent Colloidal Lead Halide Perovskite Nanoplatelets: Systematic Photostability Investigation"
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- 44. "Synthetic Lateral Metal-Semiconductor Heterostructures of Transition Metal Disulfides,"
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- 43. "Perspective: Nonequilibrium Dynamics of Localized and Delocalized Excitons in Colloidal Quantum Dot Solids,"
 E.M.Y. Lee, <u>W.A. Tisdale</u>*, A.P. Willard*;
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- 42. "Ideal Bandgap in a Ruddlesden-Popper Chalcogenide for Single-Junction Solar Cells,"
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- "Inverse Temperature Dependence of Charge Carrier Hopping in Quantum Dot Solids," R.H. Gilmore, S.W. Winslow, E.M.Y. Lee, M.N. Ashner, K.G. Yager, A.P. Willard, <u>W.A. Tisdale</u>; *ACS Nano* 12, 7741-7749 (2018).
- 40. "Ultrafast Charge Transfer at a Quantum Dot/2D Materials Interface Probed by Second Harmonic Generation,"
 A.J. Goodman, N.S. Dahod, <u>W.A. Tisdale</u>;

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- "High Repetition-Rate Femtosecond Stimulated Raman Spectroscopy with Fast Acquisition," M.N. Ashner and <u>W.A. Tisdale;</u> *Optics Express* 26, 18331-18340 (2018).
- 38. "Phase-Modulated Degenerate Parametric Amplification Microscopy,"
 Y. Gao, A.J. Goodman, P.C. Shen, J. Kong, <u>W.A. Tisdale</u>; *Nano Lett.* 18, 5001-5006 (2018).
- 37. "Impact of Size Dispersity, Ligand Coverage, and Ligand Length on the Structure of PbS Nanocrystal Superlattices,"
 M.C. Weidman, Q. Nguyen, D.-M. Smilgies, <u>W.A. Tisdale</u>; *Chem. Mater.* 30, 807-816 (2018).
- 36. "Obtaining Structural Parameters from STEM-EDX Maps of Core/Shell Nanocrystals for Optoelectronics,"
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- "A Nanobionic Light Emitting Plant,"
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- 34. "Exciton Trapping is Responsible for the Long Apparent Lifetime in Acid-Treated MoS₂,"
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- 33. "Including Surface Ligand Effects in Continuum Elastic Models of Nanocrystal Vibrations,"
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- 32. "CdSe Nanoplatelet Films with Controlled Orientation of Their Transition Dipole Moment,"
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- "Colloidal Halide Perovskite Nanoplatelets: An Exciting New Class of Semiconductor Nanomaterials," M.C. Weidman, A.J. Goodman, <u>W.A. Tisdale</u>; *Chem. Mater.* 29, 5019-5030 (2017).
- "Tunable Light-Emitting Diodes Utilizing Quantum-Confined Layered Perovskite Emitters," D.N. Congreve, M.C. Weidman, M. Seitz, W. Paritmongkol, N.S. Dahod, <u>W.A. Tisdale</u>; ACS Photonics 4, 476-481 (2017).
- "Chare Carrier Hopping Dynamics in Homogeneously Broadened PbS Quantum Dot Solids," R.H. Gilmore, E.M.Y. Lee, M.C. Weidman, A.P. Willard, <u>W.A. Tisdale</u>; *Nano Lett.* 17, 893-901 (2017).
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- 27. "Near-Infrared Photoluminescence and Thermal Stability of PbS Nanocrystals at Elevated Temperatures,"
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- 26. "Efficient Nanosecond Photoluminescence from Infrared PbS Quantum Dots Coupled to Plasmonic Nanoantennas,"
 G.M. Akselrod, M.C. Weidman, Y. Li, C. Argyropoulos, <u>W.A. Tisdale</u>, M.H. Mikkelsen;
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- 25. "Highly Tunable Colloidal Perovskite Nanoplatelets through Variable Cation, Metal, and Halide Composition,"
 M.C. Weidman, M. Seitz, S.D. Stranks, <u>W.A. Tisdale</u>;
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- 24. "Modulation of Low-Frequency Acoustic Vibrations in Semiconductor Nanocrystals through Choice of Surface Ligand,"
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- 23. "Kinetics of the Self-Assembly of Nanocrystal Superlattices Measured by Real-Time *in situ* X-ray Scattering,"
 M.C. Weidman, D.-M. Smilgies, <u>W.A. Tisdale</u>; *Nature Materials* 15, 775-781 (2016).
- 22. "Reply to Comment on Enhancement of Second-Order Nonlinear Optical Signals by Optical Stimulation,"
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- 21. "Can Disorder Enhance Incoherent Exciton Diffusion?"
 E.M.Y. Lee, <u>W.A. Tisdale</u>, Adam Willard; *J. Phys. Chem. B* 119, 9501-9509 (2015).
- "Constructing Multifunctional Virus-Templated Nanoporous Composites for Thin Film Solar Cells: Contributions of Morphology and Optics to Photocurrent Generation," N.-M. Dorval Courchesne, M.T. Klug, K.J. Huang, M.C. Weidman, V.J. Cantu, P.-Y. Chen, S.E. Kooi, D.S. Yun, <u>W.A. Tisdale</u>, N.X. Fang, A.M. Belcher, P.T. Hammond; J. Phys. Chem. C 119, 13987-14000 (2015).
- "Colloidal Organohalide Perovskite Nanoplatelets Exhibiting Quantum Confinement,"
 P. Tyagi, S.M. Arveson, <u>W.A. Tisdale;</u>
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- 18. "Enhancement of Second-Order Nonlinear Optical Signals by Optical Stimulation,"
 A.J. Goodman and <u>W.A. Tisdale;</u>
 Phys. Rev. Lett. 114, 183902 (2015).
- 17. "Determination of Exciton Diffusion Length by Transient Photoluminescence Quenching and its Application to Quantum Dot Films,"
 E.M.Y. Lee and <u>W.A. Tisdale;</u>
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- "Interparticle Spacing and Structural Ordering in Superlattice PbS Nanocrystal Solids Undergoing Ligand Exchange,"
 M.C. Weidman, K.G. Yager, <u>W.A. Tisdale</u>;
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- "Reduced Dielectric Screening and Enhanced Energy Transfer in Single- and Few-Layer MoS₂,"
 F. Prins, A.J. Goodman, <u>W.A. Tisdale</u>; *Nano Lett.* 14, 6087-6091 (2014).
- 14. "Magnitude of the Förster Radius in Colloidal Quantum Dot Solids," A.J. Mork, M.C. Weidman, F. Prins, <u>W.A. Tisdale</u>; *J. Phys. Chem. C* 118, 13920-13928 (2014).
- "Monodisperse, Air-Stable PbS Nanocrystals *via* Precursor Stoichiometry Control," M.C. Weidman, M.E. Beck, R.S. Hoffman, F. Prins, <u>W.A. Tisdale</u>; *ACS Nano* 8, 6363-6371 (2014).
- "Subdiffusive Exciton Transport in Quantum Dot Solids,"
 G.M. Akselrod*, F. Prins*, L.V. Poulikakos, E.M.Y. Lee, M.C. Weidman, A.J. Mork, A.P. Willard, V. Bulović, <u>W.A. Tisdale</u>; *Nano Lett.* 14, 3556-3562 (2014).
- "Visualization of Exciton Transport in Ordered and Disordered Molecular Solids,"
 G.M. Akselrod, P.B. Deotare, N.J. Thompson, J. Lee, <u>W.A. Tisdale</u>, M.A. Baldo, V.M. Menon, V. Bulović; *Nature Commun.* 5, 3646 (2014).
- 10. "Transition from Thermodynamic to Kinetic-Limited Excitonic Energy Migration in Colloidal Quantum Dot Solids,"
 L.V. Poulikakos, F. Prins, <u>W.A. Tisdale</u>; *J. Phys. Chem. C* 118, 7894-7900 (2014).
- "Spatially Resolved Energy Transfer in Patterned Colloidal Quantum Dot Heterostructures,"
 F. Prins, A. Sumitro, M.C. Weidman, <u>W.A. Tisdale</u>;
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- "Highly Efficient, Dual State Emission from an Organic Semiconductor," S. Reineke, N. Seidler, S.R. Yost, F. Prins, <u>W.A. Tisdale</u>, M.A. Baldo; *Appl. Phys. Lett.* 103, 093302 (2013).

Publications originating from PhD and postdoctoral work:

- 7. "Origin of Efficiency Roll-Off in Colloidal Quantum-Dot Light-Emitting Diodes;"
 Y. Shirasaki, G.J. Supran, <u>W.A. Tisdale</u>, V. Bulović; *Phys. Rev. Lett.* 110, 217403 (2013).
- 6. "Twenty-Fold Enhancement of Molecular Fluorescence by Coupling to a J-Aggregate Critically Coupled Resonator,"
 G.M. Akselrod, B.J. Walker, <u>W.A. Tisdale</u>, M.G. Bawendi, V. Bulović;
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- "Artificial Atoms and Molecules on Semiconductor Surfaces," <u>W.A. Tisdale</u>, X.-Y. Zhu; *Proc. Nat. Acad. Sci. USA* 108, 965 (2011).

- "Hot-Electron Transfer from Semiconductor Nanocrystals," <u>W.A. Tisdale</u>, K.J. Williams, B.C. Timp, D.J. Norris, X.-Y. Zhu; *Science* 328, 1543 (2010).
- "Strong Electronic Coupling in Two-Dimensional Assemblies of Colloidal PbSe Quantum Dots," K.J. Williams, <u>W.A. Tisdale</u>, K.S. Leschkies, G. Haugstad, D.J. Noris, E.S. Aydil, X.-Y. Zhu; *ACS Nano* 3, 1532 (2009).
- "Coulomb Barrier for Charge Separation at an Organic Semiconductor Interface," M. Muntwiler, Q. Yang, <u>W.A. Tisdale</u>, X.-Y. Zhu; *Phys. Rev. Lett.* 101, 196403 (2008).
- "Electron Dynamics at the ZnO (10-10) Surface," <u>W.A. Tisdale</u>, M. Muntwiler, D.J. Norris, E.S. Aydil, X.-Y. Zhu; *J. Phys. Chem. C* 112, 14682 (2008).

Talks, Seminars, and Presentations

Talks, seminars, and presentations as an independent PI:

- 121. "Silver Organochalcogenolates: an Emerging Family of Low-Dimensional Excitonic Materials," **invited** talk at the workshop of *Exciton Transport in 2D Materials*; San Sebastian, Spain; May, 2023.
- 120. "Light-Emitting Organochalcogenolates," **invited** talk at the *MRS Spring Meeting*; San Francisco, CA; April, 2023.
- 119. "Persistent Enhancement of Exciton Diffusivity in CsPbBr₃ Nanocrystal Solids," **invited** talk at the *MatSus 2023 Conference*; Valencia, Spain; March, 2023.
- 118. "Excitons, Disorder, and Nonequilibrium Transport in Hybrid Semiconductor Nanomaterials," **invited** seminar at the *Department of Chemical Engineering at the University of Florida*; Gainseville, FL; January, 2023.
- 117. "Persistent Enhancement of Exciton Diffusivity in CsPbBr₃ Nanocrystal Solids," **invited** talk at the *MRS Fall Meeting*; Boston, MA; Dec, 2022.
- 116. "Persistent Enhancement of Exciton Diffusivity in CsPbBr₃ Nanocrystal Solids," **invited** talk at the *AIChE Annual Meeting*; Phoenix, AZ; Nov, 2022.
- 115. "Persistent Enhancement of Exciton Diffusivity in CsPbBr₃ Nanocrystal Solids," **invited** talk at *Emerging Light Emitting Materials*; Limmasol, Cyprus; Oct, 2022.
- 114. "Silver Organochalcogenides: An Emerging Family of Hybrid 2D Semiconductors," **invited** talk at the *MRS Spring Meeting*; Honolulu, Hawaii [virtual]; May, 2022.
- 113. "Extraordinary Exciton Transport Phenomena in CsPbBr₃ Nanocrystal Solids," **invited** talk at the *MRS Spring Meeting*; Honolulu, Hawaii [virtual]; May, 2022.
- 112. "Hybrid Semiconductor Nanomaterials: from Synthesis to Exciton Dynamics," **invited** seminar at the *Physical/Inorganic Chemistry Seminar Series at the University of Oklahoma*; Norman, OK [virtual]; April, 2022.
- 111. "Exciton Dynamics in Hybrid Perovskite Nanomaterials," **invited** talk at the *ACS Spring Meeting*; San Diego, CA; March, 2022.
- 110. "Excitons, Disorder, and Nonequilibrium Transport in Hybrid Semiconductor Nanomaterials," **invited** seminar at the *Physical Chemistry Seminar Series at Wayne State University*; Detroit, MI [virtual]; January, 2022.
- 109. "Revealing the Molecular Origin of Interactions between Nanocrystals," poster presented at the *DOE Neutron Scattering Principle Investigators' Meeting*; Online Meeting [virtual]; December, 2021.

- 108. "Excitonic Phenomena in 2D Hybrid Perovskites," **invited** talk presented at the *MRS Fall Meeting*; Boston, MA; December, 2021.
- 107. "Interlayer Vibrational and Thermal Transport Phenomena in 2D Hybrid Perovskites," **invited** talk at the *AIChE Annual Meeting*; Boston, MA; November, 2021.
- 106. "Metal-Organic Chalcogenolates," **invited** talk at the *ARO Physical Properties of Materials Principle Investigators' Meeting*; Online Meeting [virtual]; October, 2021.
- 105. "Interfacial Exciton Dynamics in Atomically Thin Semiconductors," **invited** talk at the *ACS Spring Meeting*; Online Meeting [virtual]; April, 2021.
- 104. "Energy Transport Processes in Halide Perovskite Nanomaterials," **invited** talk at the *ACS Spring Meeting*; Online Meeting [virtual]; April, 2021.
- 103. "Excitonic Properties and Excited State Dynamics in Halide Perovskite Nanomaterials," **invited** talk at the *DOE BES Physical Behavior of Materials Principle Investigator's Meeting*; Gaithersburg, MD [virtual]; March, 2021.
- 102. "Visualizing Spatiotemporal Dynamics in Semiconductor Nanomaterials," **invited** seminar at the *Photonics Seminar Series at the University of California*; Irvine, CA [virtual]; February, 2021.
- 101. "Excitons, Disorder, and Nonequilibrium Transport in Hybrid Semiconductor Nanomaterials," **invited** seminar at the *Optoelectronics Seminar Series at the University of Cambridge*; Cambridge, UK [virtual]; December, 2020.
- 100. "Hybrid Semiconductor Nanomaterials: from Soft Matter to Ultrafast Dynamics," **invited** seminar at the *Centennial & Jubilee Alumni Lecture Series at the Department of Chemical Engineering and Materials Science at the University of Minnesota*; Minneapolis, MN [virtual]; November, 2020.
- 99. "Excitonic and Vibrational Phenomena in Emerging 2D Light-Emitting Materials," **invited** talk at the *MRS Fall Meeting*; Boston, MA [virtual]; November, 2020.
- 98. "Spatially Resolved Spectroscopies for Semiconductor Nanomaterials," **invited** talk at the *AIChE Annual Meeting*; San Francisco, CA [virtual]; November, 2020.
- 97. "Nonequilibrium Transport of Excitons and Charges in Low-Dimensional Semiconductors," **invited** talk at the *CUNY Institute for the Theoretical Sciences*; New York, NY [virtual]; November, 2020.
- 96. "Hybrid Semiconductor Nanomaterials: from Soft Matter to Ultrafast Dynamics," **invited** seminar at the *Soft Material Seminar Series at Purdue University*; West Lafayette, IN [virtual]; October, 2020.
- 95. "Visualizing Spatiotemporal Dynamics in Semiconductor Nanomaterials," **invited** talk at the *OMEL Summer School*; ETH, Zurich [virtual]; July, 2020.
- 94. "Surface Morphology of Infrared-Active Lead Sulfide Nanocrystals," **invited keynote** talk presented at *iCQD: the Internet Conference on Quantum Dots*; online meeting [virtual]; July, 2020.
- 93. "Exciton transport in nanoscale semiconductors," invited talk to be presented at the *Telluride Workshop on Spatiotemporal Dynamics of Excitons*; Telluride, CO; August, 2020 (canceled due to COVID-19).
- 92. "Structure and Dynamics in Perovskite Nanomaterials," **invited** talk to be presented at the *ACS Spring Meeting*; Philadelphia, PA; March, 2020 (canceled due to COVID-19).
- 91. "Interfacial Exciton Dynamics in Atomically Thin Semiconductors," **invited** talk to be presented at the *ACS Spring Meeting*; Philadelphia, PA; March, 2020 (canceled due to COVID-19).
- 90. "Energy Transport Processes in Halide Perovskite Nanomaterials," **invited** talk to be presented at the *ACS Spring Meeting*; Philadelphia, PA; March, 2020 (canceled due to COVID-19).
- 89. "Excitons, Phonons, and Excited State Dynamics in Low-Dimensional Halide Perovskites," **invited** talk presented at *E*₃*S* 2020: Exciton Engineering in Emerging Semiconductors; Madrid, Spain; January, 2020.
- 88. "Excitons, Phonons, and Excited State Dynamics in Low-Dimensional Halide Perovskites," **invited** talk presented at the *MRS Fall Meeting*; Boston, MA; December, 2019.
- 87. "Energy Transport Processes in Hybrid Perovskite Nanomaterials," **invited plenary** speaker at the *AIChE Annual Meeting*; Orlando, FL; November, 2019.

- 86. "Exciton-Exciton and Exciton-Lattice Interactions in 2D and 0D Perovskites," contributed talk at the *nanoGe Fall Meeting*; Berlin, Germany; November, 2019.
- 85. "Nonequilibrium Dynamics of Excitons and Charges in Semiconductor Nanomaterials," **invited plenary** speaker at the *nanoGe Fall Meeting*; Berlin, Germany; November, 2019.
- 84. "Hybrid Semiconductor Nanomaterials: from Soft Materials to Ultrafast Dynamics," **invited** seminar at the *Materials Science & Engineering Colloqium at Boston University*; Boston, MA; October, 2019.
- 83. "Exciton, Phonon, and Charge Carrier Dynamics in Hybrid Perovskite Nanomaterials," **invited** seminar presented at the *Institute for Energy Efficiency at the University of California at Santa Barbara*; Santa Barbara, CA; April, 2019.
- 82. "Excitons in Low-Dimensional Perovskites," **invited** poster at the *Physical Behavior of Materials Principle Investigators Meeting, U.S. Department of Energy, Basic Energy Sciences*; Gaithersburg, MD; March, 2019.
- 81. "Excitons, Entropy, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemistry at the University of Chicago*; Chicago, IL; March, 2019.
- 80. "Visualizing Ultrafast Interfacial Phenomena in 2D Materials," contributed talk presented at the *MRS Fall Meeting*; Boston, MA; November, 2018.
- 79. "Ordered and Disordered Assemblies of Colloidal Nanomaterials," **invited** seminar presented at the *Department of Chemical Engineering at the University of Michigan*; Ann Arbor, MI; November, 2018.
- 78. "2D Lead Halide Perovskite Nanomaterials," **invited** poster presentation at the *Dreyfus Teacher-Scholar Symposium*; New York, NY; October, 2018.
- 77. "Excitons in Low-Dimensional Perovskites," **invited** talk presented at the 14th Meeting of the Condensed Phase and Interfacial Molecular Sciences Program, Department of Energy, Office of Basic Energy Sciences; Gaithersburg, MD; October, 2018.
- 76. "Excitons, Entropy, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemistry at Texas A&M University*; College Station, TX; October, 2018.
- 75. "Excitons, Entropy, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemical Engineering at Rochester Institute of Technology*; Rochester, NY; September, 2018.
- 74. "Nonequilibrium Dynamics in Colloidal Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemical and Biomolecular Engineering at the University of California at Berkeley*; Berkeley, CA; September, 2018.
- 73. "Spatially Resolved Spectroscopies for Semiconductor Nanomaterials," **invited** talk presented at the *ACS Fall Meeting*; Boston, MA; August, 2018.
- 72. "The Effects of Disorder, Trapping, and Structural Transformations on Charge Carrier Dynamics in Quantum Dot Solids," **invited** talk presented at the *Gordon Research Conference on Quantum Dots*; Smithfield, RI; July, 2018.
- 71. "Synthesis and Optical Properties of 2D Halide Perovskites," **invited** talk presented at the *MRS Spring Meeting*; Phoenix, AZ; April, 2018.
- 70. "Interfacial Exciton Dynamics in Atomically Thin Semiconductors," **invited** talk presented at the *ACS Spring Meeting*; New Orleans, LA; March, 2018.
- 69. "Synthesis and Optical Properties of 2D Halide Perovskites," **invited** talk presented at the *ACS Spring Meeting*; New Orleans, LA; March, 2018.
- 68. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Electrical Engineering at the University of Toronto*; Toronto, CA; March, 2018.
- 67. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Rowland Institute at Harvard University*; Cambridge, MA; February, 2018.

- 66. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *MRSEC Center at Northwestern University*; Evanston, IL; January, 2018.
- 65. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemistry (Physical Chemistry) at the University of Colorado*; Boulder, CO; December, 2017.
- 64. "Origin of Trap States in PbS Quantum Dot Solids," **invited** talk presented at the *MRS Fall Meeting*; Boston, MA; November, 2017.
- 63. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemical and Biological Engineering at the University of Illinois*; Urbana, IL; November, 2017.
- 62. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemistry at the University of Massachusetts*; Amherst, MA; November, 2017.
- 61. "Disorder, Nonequilibrium Transport, and the Critical Role of Size Dispersity in Colloidal Semiconductor Nanomaterials," **invited award** talk presented at the *NSEF Plenary Session, AIChE Annual Meeting*; Minneapolis, MN; November, 2017.
- 60. "Origin of Deep Traps in Colloidal Quantum Dot Solids," contributed talk presented at the *AIChE Annual Meeting*; Minneapolis, MN; November, 2017.
- 59. "Optical Parametric Imaging and Nonequilibrium Dynamics in Nanocrystal Arrays," **invited** talk presented at the 13th Meeting of the Condensed Phase and Interfacial Molecular Sciences Program, Department of Energy, Office of Basic Energy Sciences; Gaithersburg, MD; October, 2017.
- 58. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemical Engineering at Iowa State University*; Ames, IA; September, 2017.
- 57. "Luminescent 2D Metal Halide Perovskite Nanoplatelets," talk presented at the *Department of Energy EFRC-Hub PI Meeting*; Washington, D.C.; July, 2017.
- 56. "Origin of Trap States in PbS Quantum Dot Solids," poster presented at the *2017 AFOSR Molecular Dynamics and Theoretical Chemistry Program Review*; Albuquerque, NM; May, 2017.
- 55. "Nonequilibrium Charge and Exciton Transport in Quantum Dot Solids," **invited** talk presented at the *Workshop on Charge & Energy Transport in Nanocrystal Assemblies*; University of Minnesota, Minneapolis, MN; May, 2017.
- 54. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemical Engineering at the Georgia Institute of Technology*; Atlanta, GA; March, 2017.
- 53. "Interfacial Exciton Dynamics in Atomically Thin Semiconductors," **invited** talk presented at the *APS March Meeting*; New Orleans, LA; March, 2017.
- 52. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Boston Area Excitonics Meeting*; Harvard University, Cambridge, MA; February, 2017.
- 51. "Halide Perovskite Nanoplatelets," contributed talk presented at the *MRS Fall Meeting*; Boston, MA; December, 2016.
- 50. "Quantum Confined 2D Halide Perovskites," contributed talk presented at the *MRS Fall Meeting*; Boston, MA; December, 2016.
- 49. "Halide Perovskite Nanoplatelets," contributed talk presented at the *AIChE Annual Meeting*; San Francisco, CA; November, 2016.
- 48. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemistry at the University of California*; Berkeley, CA; November, 2016.
- 47. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *MRSEC Center at Columbia University*; New York, NY; October, 2016.

- 46. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemistry at the University of Texas*; Austin, TX; September, 2016.
- 45. "Photonics and Excitonics," **invited** discussion leader at the *Gordon Research Conference on Colloidal Semiconductor Nanocrystals*; Mt. Snow, VT; August, 2016.
- 44. "Exciton Transport in Semiconductor Nanomaterials," **invited** talk presented at the *MRS Spring Meeting*; Phoenix, AZ; March, 2016.
- 43. "Real-Time Imaging of Nanocrystal Superlattice Self-Assembly," contributed talk presented at the *MRS Spring Meeting*; Phoenix, AZ; March, 2016.
- 42. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemical Engineering at Caltech*; Pasadena, CA; March, 2016.
- 41. "Excitons, Disorder, and Nonequilibrium Transport in Semiconductor Nanomaterials," **invited** seminar presented at the *Department of Chemical Engineering at the University of Washington*; Seattle, WA; January, 2016.
- 40. "Phonon Engineering in Semiconductor Nanocrystals through Surface Chemistry," contributed talk presented at the *MRS Fall Meeting*; Boston, MA; December, 2015.
- 39. "Real-Time Imaging of Nanocrystal Superlattice Self-Assembly," contributed talk presented at the *AIChE Annual Meeting*; Salt Lake City, UT; November, 2015.
- 38. "Stimulated Second Harmonic Generation for High-Speed Interfacial Spectroscopy and Imaging," invited talk presented at the 11th Meeting of the Condensed Phase and Interfacial Molecular Sciences Program, Department of Energy, Office of Basic Energy Sciences; Gaithersburg, MD; November, 2015.
- 37. "Exciton Dynamics in Hybrid 0D/2D Systems," **invited** talk presented at the *Energy Frontier Research Centers Principle Investigators Meeting*; Washington, D.C.; October, 2015.
- 36. "Energy Transport Phenomena in Nanostructured Materials," **invited** seminar presented at the *Department of Chemical Engineering at Drexel University*; Philadelphia, PA; October, 2015.
- 35. "Exciton Dynamics in Quantum Dot Films and Interfaces," **invited** talk presented at the *Center for Integrated Nanotechnologies User Meeting*; Santa Fe, NM; September, 2015.
- 34. "Engineering Colloidal Quantum Dot Materials Through Surface Chemistry," **invited** poster presentation at the *3M Science & Engineering Faculty Day*; St. Paul, MN; June, 2015.
- 33. "Thermal Imaging of Flexible Photovoltaic Materials," talk presented at the *Eni-MIT Solar Frontiers Center Annual Meeting*; Milan, Italy; June, 2015.
- 32. "Exciton Dynamics in Quantum Dot Films and Interfaces," **invited** talk presented at the *APS March Meeting*; San Antonio, TX; March, 2015.
- 31. "Exciton Dynamics at Hybrid QD-MoS₂ Interfaces," contributed talk presented at the *MRS Fall Meeting*; Boston, MA; December, 2014.
- 30. "Vision for the Future of Nanotechnology," **invited** panelist at the *MTL 30th Anniversary Symposium*; Cambridge, MA; October, 2014.
- 29. "Exciton Transport in Quantum Dot Solids," **invited** talk presented at *SPIE Optics + Photonics*; San Diego, CA; August, 2014.
- 28. "Energy Conversion and Charge Transport," **invited** discussion leader at the *Gordon Research Conference on Colloidal Semiconductor Nanocrystals*; Smithfield, RI; July, 2014.
- 27. "Thermal and Morphological Imaging of Organic Photovoltaic Materials," talk presented at the *Eni-MIT Solar Frontiers Center Annual Meeting*; Milan, Italy; June, 2014.
- 26. "Exciton Transport in Colloidal Quantum Dot Solids," seminar presented at the *Division of Physical Chemistry at the University of North Carolina*; Chapel Hill, NC; May, 2014.
- 25. "Exciton Diffusion in Quantum Dot Assemblies," **invited** talk presented at the *MRS Spring Meeting*; San Francisco, CA; April, 2014.
- 24. "Exciton Transport in Quantum Dot Solids," contributed talk presented at the *MRS Fall Meeting*; Boston, MA; December, 2013.

- 23. "Exciton Transport in Quantum Dot Solids," contributed talk presented at the *AIChE Annual Meeting*; San Francisco, CA; November, 2013.
- 22. "Energy Transport in Colloidal Quantum Dot Materials: New Approaches and Applications," **invited** seminar presented at *3M, Inc.*; St. Paul, MN; April 2013.
- 21. "New Opportunities in Nonlinear Optical Imaging,"
 invited seminar presented at the *Modern Optics and Spectroscopy Seminar Series at MIT*; Cambridge, MA; April 2012.

Talks, seminars, and presentations originating from PhD and postdoctoral work:

- 20. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," **invited** seminar presented at the *Energy Science and Technology Seminar Series at Brown University*; Providence, RI; November 2011.
- "Hot Electron Transfer from Semiconductor Nanocrystals,"
 invited talk presented at the AVS 58th International Symposium; Nashville, TN; October 2011.
- 18. "Enhancement of Molecular Fluorescence by Excitonic Coupling to a J-Aggregate Critically Coupled Resonator," talk presented at the *AIChE Annual Meeting*; Minneapolis, MN; October 2011.
- 17. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," **invited** seminar presented at the *Precourt Institute for Energy at Stanford University*; Palo Alto, CA; March 2011.
- 16. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," **invited** seminar presented at the *Department of Chemical Engineering at MIT*; Cambridge, MA; February 2011.
- 15. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," **invited** seminar presented at the *Department of Chemical and Biomolecular Engineering at North Carolina State University*; Raleigh, NC; February 2011.
- 14. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," **invited** seminar presented at the *Department of Chemical Engineering at the University of Delaware*; Newark, DE; February 2011.
- 13. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," **invited** seminar presented at the *Department of Chemical and Biological Engineering at the University of Colorado*; Boulder, CO; January 2011.
- 12. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," **invited** seminar presented at the *Department of Chemistry at the University of Minnesota*; Minneapolis, MN; January 2011.
- 11. "Hot Electron Transfer from Semiconductor Nanocrystals," poster presented at the *MRS Fall Meeting*; Boston, MA; December 2010.
- 10. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," talk presented at the *AIChE Annual Meeting*; Salt Lake City, UT; November 2010.
- 9. "Electronic Relaxation Dynamics at the ZnO(10-10) Surface," talk presented at the *AIChE Annual Meeting*; Salt Lake City, UT; November 2010.
- 8. "Hot Electron Transfer from Semiconductor Nanocrystals: Implications for Quantum Dot Photovoltaics," **invited** seminar presented at the *Department of Chemical Engineering at the University of California at Santa Barbara*; Santa Barbara, CA; October 2010.
- "Hot Electron Transfer from Semiconductor Nanocrystals,"
 invited seminar presented at the *Center for Excitonics at MIT*; Cambridge, MA; March 2010.
- 6. "Hot Electron Transfer from PbSe Nanocrystals," talk presented at the *MRS Fall Meeting*; Boston, MA; December 2009.

- "Hot Electron Transfer from Semiconductor Nanocrystals," poster presented at the *Third Annual Minnesota Nanotechnology Conference*; Minneapolis, MN; November 2009.
- 4. "Hot Electron Transfer from PbSe Nanocrystals Probed by Surface Second Harmonic Generation," poster presented at the *Gordon Research Conference on Clusters, Nanocrystals, & Nanostructures;* South Hadley, MA; July 2009.
- 3. "Using Time-Resolved Surface Second Harmonic Generation to Probe Interfacial Electron Transfer at a Semiconductor Surface," poster presented at the 6th International Conference on Ultrafast Surface Dynamics; Kloster-Banz, Germany; July 2008.
- "Electron Dynamics at the ZnO(10-10) Surface," talk presented at the ACS Spring Meeting; New Orleans, LA; April 2008.
- "Time-Resolved Two-Photon Photoelectron Spectroscopy as a Probe of Excited State Electronic Structure at an Oxide Semiconductor Surface," talk presented at the AVS Surface Analysis Symposium; Minneapolis, MN; June 2007.