

CURRICULA VITAE

Ming Lee Tang

Department of Chemistry,
315 South 1400 East Rm 4272,
Salt Lake City UT 84112.

Office: 801-581-8924
Laboratory: 801-581-4620
Email: minglee.tang@utah.edu

Education and Training

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|---|--|--|
| Brandeis University | Chemistry & Economics | 2004: B. S. & B. A. |
| Stanford University | Chemistry | 2009: Ph.D. |
| University of California, Berkeley & Lawrence Berkeley National Laboratory | Single Particle Microscopy with Plasmonic Nanocatalysts; Solar Fuel with Semiconductor Nanoparticles | 2009 – 2012: Postdoctoral Research |

Research and Professional Experience

2021-present Associate Professor, University of Utah.
2018-2021 Associate Professor, University of California, Riverside.
2012-2018 Assistant Professor, University of California, Riverside.

Honors & Awards

2020 Women Scientists at the Forefront of Energy Research, ACS Energy Letters
2018 Department of Energy Early Career Research Program
2017 Sloan Research Fellowship
2014 National Science Foundation (NSF) CAREER Award.
2014 Army Research Office (ARO) Young Investigator Program (YIP) Award.
2005-2008 Kodak Graduate Fellowship
2001-2004 Phi Beta Kappa. Justice Brandeis Scholarship, Brandeis University.
Snider prize in Chemistry; Student Award from American Institute of Chemists

Publications: Total citations: >7200; H-index: 44.

Publications (undergraduate/ high school student contributors underlined)

1. T. Huang, S. He, A. Ni, T. Lian, **M. L. Tang**, "Triplet energy transfer from quantum dots increases Ln(III) photoluminescence, enabling excitation at visible wavelengths" **2024 accepted**.
2. T. Qiao, P. Bordoloi, T. Miyashita, J. A. Dionne, **M. L. Tang**, "Tuning the Chiral Growth of Plasmonic Bipyramids via the Wavelength and Polarization of Light" **2024 accepted**.
3. Z. Huang, T. Miyashita, **M. L. Tang**, "Photon Upconversion at Organic-Inorganic Interfaces" *Annu. Rev. Phys. Chem.*, **2024 accepted**.
4. T. Miyashita, P. Jaimes, A. Mardini, M. Fumanal, **M. L. Tang**, "High-Level Reverse Intersystem Crossing and Molecular Rigidity Improve Spin Statistics for Triplet–Triplet Annihilation Upconversion" *J. Phys. Chem. Lett.*, 14, 6119, **2023**.
5. K. Wang, R. P. Cline, J. Schwan, J. M. Strain, S. T. Roberts, L. Mangolini, J. D. Eaves, **M. L. Tang**, "Efficient Photon Upconversion Enabled by Strong Coupling Between Organic Molecules and Quantum Dots" *Nature Chem.*, 15, 1172, **2023**.
6. P. Jaimes, T. Miyashita, **M. L. Tang**, "Photon Upconversion in the visible wavelengths with ZnSe/InP/ZnS nanocrystals" *J. Phys. Chem. C*, 127, 1752, **2023**.
7. J. Schwan, Wang, K. Wang, **M. L. Tang**, L. Mangolini, "Gas-Phase Grafting for the Multifunctional Surface Modification of Silicon Quantum Dots" *Nanoscale*, 14, 17385, **2022**.

8. T. Miyashita, P. Jaimes, T. Lian, **M. L. Tang**, Z. Xu, "Quantifying the Ligand-Induced Triplet Energy Transfer Barrier in a Quantum Dot-Based Upconversion System" *J. Phys. Chem. Lett.*, 13, 3002, **2022**. (selected for supplementary journal cover)
9. E. M. Rigsby, T. Miyashita, D. A. Fishman, S. T. Roberts, **M. L. Tang**, "CdSe nanocrystal sensitized photon upconverting film" *RSC Adv.*, 49, 31042, **2021**.
10. T. Huang, T. Koh, J. Schwan, T. Tran, P. Xia, K. Wang, L. Mangolini, **M. L. Tang**, S. T. Roberts, "Bidirectional Triplet Exciton Transfer Between Silicon Nanocrystals and Perylene" *Chem. Sci.*, 12, 6737, **2021**.
11. P. Xia, J. Schwan, T. W. Dugger, L. Mangolini, **M. L. Tang**, "Air-Stable Silicon Nanocrystal-Based Photon Upconversion" *Adv. Optical Mater.*, 2100453, **2021**.
12. Z. Xu, Z. Huang, T. Jin, T. Lian, **M. L. Tang**, "Mechanistic understanding and rational design of quantum dot/mediator interfaces for efficient photon upconversion" *Acc. Chem. Res.*, 54, 70, **2021**. (invited, selected for journal cover)
13. S. Han, R. Deng, Q. Gu, L. Ni, U. Huynh, J. Zhang, Z. Yi, B. Zhao, H. Tamura, A. Pershin, H. Xu, Z. Huang, S. Ahmad, M. Abdi-Jalebi, A. Sadhanala, **M. L. Tang**, A. Bakulin, D. Beljonne, X. Liu, A. Rao, "Lanthanide-doped inorganic nanoparticles turn molecular triplet excitons bright" *Nature*, 587, 594, **2020**.
14. Z. Huang, Z. Xu, T. Huang, V. Gray, K. Moth-Poulsen, T. Lian, **M. L. Tang**, "Evolution from tunneling to hopping mediated triplet energy transfer from quantum dots to molecules" *J. Am. Chem. Soc.*, 142, 17581, **2020**.
15. E. M. Rigsby, T. Miyashita, P. Jaimes, D. A. Fishman, **M. L. Tang**, "On the size-dependence of CdSe nanocrystals for photon upconversion with anthracene" *J. Chem. Phys.*, 153, 114702, **2020**.
16. Z. Xu, Z. Huang, C. Li, T. Huang, F. A. Evangelista, **M. L. Tang**, T. Lian, "Tuning the quantum dot (QD)/mediator interface for optimal efficiency of QD-sensitized near-infrared-to-visible photon upconversion systems" *ACS Appl. Mater. Interfaces*, 12, 36558, **2020**.
17. P. Xia, D. W. Davies, B. B. Patel, M. Qin, Z. Liang, K. R. Graham, Y. Diao, **M. L. Tang**, "Spin-coated fluorinated PbS QD superlattice thin film with high hole mobility" *Nanoscale*, 12, 11174, **2020**.
18. T. Koh, T. Huang, J. Schwan, P. Xia, S. T. Roberts, L. Mangolini, **M. L. Tang**, "Low Temperature Radical Initiated Hydrosilylation of Silicon Quantum Dots" *Faraday Discussion*, 222, 190, **2020**.
19. J. De Roo, Z. Huang, N. J. Schuster, L. Hamachi, D. N. Congreve, Z. Xu, D. A. Fishman, T. Lian, J. Owen, **M. L. Tang**, "Anthracene Diphosphate Ligands for CdSe Nanocrystals: Molecular Design for Efficient Upconversion" *Chem. Mater.*, 32, 1461, **2020**.
20. P. Xia, E. K. Raulerson, D. Coleman, C. S. Gerke, L. Mangolini, **M. L. Tang**, S. T. Roberts, "Achieving Spin-triplet Exciton Transfer between Silicon and Molecular Acceptors for Photon Upconversion" *Nature Chem.*, 12, 137, **2020**.
21. E. M. Rigsby, K. Lee, J. Sun, D. A. Fishman, **M. L. Tang**, "Primary amines enhance triplet energy transfer from both the band edge and trap state from CdSe nanocrystals" *J. Chem. Phys.*, 151, 174701, **2019**. (invited)
22. Z. Huang, Z. Xu, M. Mahboub, Z. Liang, P. Jaimes, P. Xia, K. Graham, **M. L. Tang**, T. Lian, "Enhanced near-infrared-to-visible upconversion by synthetic control of PbS nanocrystal triplet photosensitizers" *J. Am. Chem. Soc.*, 141, 9769, **2019**.
23. Z. Huang, **M. L. Tang**, "Semiconductor Nanocrystal Light Absorbers for Photon Upconversion" *J. Phys. Chem. Lett.*, 9, 6198, **2018** (invited Perspective, chosen as cover art).
24. P. Xia, M. Mahboub, J. V. Baren, C. H. Lui, **M. L. Tang**, "Surface fluorination for controlling PbS Quantum Dot Bandgap and Band Offset," *Chem. Mater.*, 30, 4943, **2018**.
25. Z. Huang, P. Xia, N. Megerdich, V. I. Vullev, D. A. Fishman, **M. L. Tang**, "ZnS shells enhance triplet energy transfer from CdSe nanocrystals for photon upconversion" *ACS Photonics*, 5, 3089, **2018**.
26. M. Mahboub, P. Xia, J. Van Baren, X. Li, CH Lui, **M. L. Tang**, "Midgap states in PbS Quantum Dots Induced by Cd and Zn Enhance Photon Upconversion" *ACS Energy Lett.*, 3, 767, **2018**.
27. J. A. Bender, E. K. Raulerson, X. Li, T. Goldzak, P. Xia, T. Van Voorhis, **M. L. Tang**, S. T. Roberts, "Surface States Mediate Triplet Energy Transfer in Nanocrystal-Acene Composite Systems" *J. Am. Chem. Soc.*, 140, 7543, **2018**.

28. Z. Huang, Z. Xu, M. Mahboub, X. Li, J. W. Taylor, W. H. Harman, T. Lian, **M. L. Tang**, "PbS/CdS core/shell QDs suppress charge transfer and enhance triplet energy transfer yield" *Angew. Chemie Int. Ed.*, 129, 16810, **2017**.
29. Z. Huang, **M. L. Tang**, "Designing molecular transmitters for efficient energy transfer between nanocrystals" *J. Am. Chem. Soc.*, 139, 9412, **2017** (invited Perspective).
30. V. Gray, P. Xia, Z. Huang, E. Moses, A. Fast, D. A. Fishman, V. I. Vullev, M. Abrahamsson, K. Moth-Poulsen, **M. L. Tang**, "CdS/ZnS core-shell nanocrystal photosensitizers for visible to UV upconversion" *Chem. Sci.*, 8, 5488, **2017**.
31. X. Li, **M. L. Tang**, "Triplet transport in thin films: fundamentals and applications" *Chem. Comm.*, 53, 4429, **2017** (invited Feature Article).
32. X. Li, A. Fastman, D. A. Fishman, Z. Huang, **M. L. Tang**, "Complementary Lock and Key ligand binding of triplet transmitters to nanocrystal photosensitizers" *Angew. Chemie Int. Ed.*, 56, 5598, **2017**.
33. P. Xia, Z. Huang, X. Li, J. Romero, Valentine I. Vullev, G. S. H. Pau, **M. L. Tang**, "On the efficacy of anthracene isomers for triplet transmission from CdSe nanocrystals" *Chem. Comm.*, 53, 1241, **2017**.
34. M. Mahboub, Z. Huang, **M. L. Tang**, "Efficient Infrared-to-Visible Upconversion with Sub-Solar Irradiance" *Nano Lett.*, 16, 7169, **2016**.
35. M. Mahboub, H. Maghsoudiganjeh, A. M. Pham, Z. Huang, **M. L. Tang**, "Triplet Energy Transfer from PbS(Se) Nanocrystals to Rubrene: the Relationship between the Upconversion Quantum Yield and Size" *Adv. Func. Mater.*, 26, 6091, **2016**.
36. Z. Huang, D. E. Simpson, M. Mahboub, X. Li, **M. L. Tang**, "Ligand enhanced upconversion of near-infrared photons with nanocrystal light absorbers" *Chem. Sci.*, 7, 4104, **2016**.
37. X. Li, Z. Huang, R. Zavala, **M. L. Tang**, "Distance-Dependent Triplet Energy Transfer between CdSe Nanocrystals and Surface Bound Anthracene," *J. Phys. Chem. Lett.*, 7, 1955, **2016**.
38. G. B. Piland, Z. Huang, M. L. Tang, C. J. Bardeen. "Dynamics of Energy Transfer from CdSe Nanocrystals to Triplet States of Anthracene Ligand Molecules" *J. Phys. Chem. C.*, 120, 5883, **2016**.
39. Z. Huang, X. Li, B. D. Yip, J. Rubalcava, C. J. Bardeen, **M. L. Tang**. "Nanocrystal Size and Quantum Yield in the Upconversion of Green to Violet Light with CdSe and Anthracene Derivatives" *Chem. Mater.*, 27, 7503, **2015**.
40. Z. Huang, X. Li, M. Mahboub, K. M. Hanson, V. M. Nichols, H. Le, **M. L. Tang**, C. J. Bardeen. "Hybrid Molecule-nanocrystal Photon Upconversion Across the Visible and Near-infrared" *Nano Lett.*, 15, 5552, **2015**.
According to the Web of Science, as of May/June 2018, this highly cited paper received enough citations to place it in the top 1% of the academic field of Physics based on a highly cited threshold for the field and publication year.
41. X. Li, L. W. Slyker, V. M. Nichols, G. S. H. Pau, C. J. Bardeen, **M. L. Tang**. "Ligand Binding to Distinct Sites on Nanocrystals Affecting Energy and Charge Transfer" *J. Phys. Chem. Lett.*, 6, 1709, **2015**.
42. X. Li, V. M. Nichols, D. Zhou, C. Lim, G. S. H. Pau, C. J. Bardeen, **M. L. Tang**. "Observation of Multiple, Identical Binding Sites in the Exchange of Carboxylic Acid Ligands with CdS Nanocrystals" *Nano Lett.*, 14, 3382, **2014**.
43. A. P. Dagg, Z. Huang, M. A. Marks, D. Zhou, M. Chawla, **M. L. Tang**, "Synthetic Control of Isolated, Single Functional Groups on Silica Surfaces" *Langmuir*, 30, 7098, **2014**.

Publications (first author, as postdoctoral fellow and graduate student)

*equal contribution

44. **M. L. Tang***, D. C. Grauer*, B. Lassalle-Kaiser, V. Yachandra, L. Amirav, J. R. Long, J. Yanko, A. P. Alivisatos, "Structural and electronic study of an amorphous MoS₃ hydrogen generation catalyst on a quantum controlled photosensitizer," *Angew. Chem. Int. Ed.* 50, 10203, **2011**. (chosen by the Editors as a "Hot Paper" for its "importance in a rapidly evolving field of high current interest".)
45. **M. L. Tang***, N. Liu*, J. A. Dionne, A. P. Alivisatos, "Observations of shape-dependent Hydrogen Uptake Trajectories from Single Nanocrystals." *J. Am. Chem. Soc.* 133, 13220, **2011**.
46. N. Liu*, **M. L. Tang***, M. Hentschel*, H. Giessen, A. P. Alivisatos, "Nanoantenna-enhanced Gas Sensing in a Single Tailored Nanofocus." *Nature Mater.* 10, 631, **2011**.

(This was selected as the cover for the August 2011 issue).

47. **M. L. Tang**, Z. Bao, "Halogenated Materials as Organic Semiconductors." *Chem. Mater.* 22, 446, **2011**.
48. **M. L. Tang**, J. H. Oh, A. D. Reichardt, Z. Bao, "Chlorination: a General Route Towards Electron Transport in Organic Semiconductors." *J. Am. Chem. Soc.* 131(10), 3733, **2009**.
49. **M. L. Tang**, A. D. Reichardt, P. Wei, Z. Bao, "Correlating Carrier Type with Frontier Molecular Orbital Energy Levels in Organic Thin Film Transistors of Functionalized Acene Derivatives." *J. Am. Chem. Soc.* 131(14), 5264, **2009**.
50. **M. L. Tang**, S. C. B. Mannsfeld, Y-S. Sun, H. A. Becerril, Z. Bao, "Pentaceno[2,3-*b*]thiophene- a Hexacene Analog for Organic Thin Film Transistors." *J. Am. Chem. Soc.* 131(3), 882, **2009**.
51. **M. L. Tang**, A. D. Reichardt, T. Siegrist, S. C. B Mannsfeld, Z. Bao, "Trialkylsilyl Ethynyl Functionalized Tetraceno[2,3-*b*]thiophene and Anthra[2,3-*b*]thiophene Organic Transistors." *Chem. Mater.* 20, 4669, **2008**.
52. **M. L. Tang**, A. D. Reichardt, N. Miyaki, R. M. Stoltenberg, Z. Bao, "Ambipolar, High-Performance, Acene-Based Organic Transistors." *J. Am. Chem. Soc.* 130(19), 6064, **2008**.
53. **M. L. Tang**, A. D. Reichardt, T. Okamoto, N. Miyaki, Z. Bao, "Functionalized Asymmetric Linear Acenes for High Performance Organic Semiconductors." *Adv. Func. Mater.* 18, 1579, **2008**.
54. **M. L. Tang**, T. Okamoto, Z. Bao, "High-Performance Organic Semiconductors: Asymmetric Linear Acenes Containing Sulphur." *J. Am. Chem. Soc.* 128(50), 16002, **2006**.
55. **M. L. Tang**, M. E. Roberts, J. J. Locklin, M. M. Ling, H. Meng, Z. Bao, "Structure Property Relationships: Asymmetric Oligofluorene-Thiophene Molecules for Organic TFTs." *Chem. Mater.* 18(26), 6250, **2006**.
(This paper was selected as the cover: March 6, 2007- April 30, 2007.)

Publications (non-first author papers, as postdoctoral fellow and graduate student)

56. H.-A. Chen, C.-L. Hsin, Y.-T. Huang, **M. L. Tang**, S. Dhuey, S. Cabrini, W.-W. Wu, S. R. Leone, "Measurement of Interlayer Screening Length of Layered Graphene by Plasmonic Nanostructure Resonances," *J. Phys. Chem. C.*, 117, 22211, **2013**.
57. Y. Sun, J. P. Bigi, N. A. Piro, **M. L. Tang**, J. R. Long, C. J. Chang, "Molecular Cobalt Pentapyridine Catalysts for Generating Hydrogen from Water." *J. Am. Chem. Soc.* 133, 9212, **2011**.
58. S. C. B. Mannsfeld, **M. L. Tang**, Z. Bao, "Thin Film Structure of Triisopropylsilylethynyl-functionalized Pentacene, Tetraceno[2,3-*b*]thiophene from GIXD." *Adv. Mater.* 23, 127, **2011**.
59. T. Okamoto, C. C. Reese, M. L. Senatore, **M. L. Tang**, Y. Jiang, S. R. Parkin, Z. Bao, "2,9-dibromopentacene: Synthesis and the Role of Substituent and Symmetry on Solid-State Order." *Synth. Metal.* 160, 2447, **2010**.
60. H. A. Becerril, R. M. Stoltenberg, **M. L. Tang**, M. E. Roberts, Z-F. Liu, Y-S. Chen, D-H. Kim, B-L. Lee, S. Lee, Z. Bao, "Fabrication and Evaluation of Solution-Processed Reduced Graphene Oxide Electrodes for p- and n-channel Bottom-Contact Organic Thin-Film Transistors." *ACS Nano.* 4, 6343, **2010**.
61. Y. Jiang, T. Okamoto, H. A. Becerril, S. Hong, **M. L. Tang**, A. C. Mayer, J. E. Parmer, M. D. McGehee, Z. Bao, "Anthradithiophene-Containing Copolymers for Thin-Film Transistors and Photovoltaic Cells." *Macromol.* 43, 6361, **2010**.
62. R. Mondal, N. Miyaki, H. A. Becerril, J. E. Norton, J. E. Parmer, A. C. Mayer, **M. L. Tang**, J. L. Bredas, M. D. McGehee, Z. Bao, "Synthesis of Acenaphthyl and Phenanthrene Based Fused-Aromatic Thienopyrazine Co-Polymers for Photovoltaic and Thin Film Transistor Applications." *Chem. Mater.* 21, 3618, **2009**.
63. P-L. T. Boudreault, S. Wakim, **M. L. Tang**, Y. Tao, Z. Bao and M. Leclerc, "New Indolo[3,2-*b*]carbazole derivatives for Field-Effect Transistors Applications." *J. Mater. Chem.* 19, 2921, **2009**.
64. H. A. Becerril, N. Miyaki, **M. L. Tang**, R. Mondal, Y-S. Sun, A. C. Mayer, J. E. Parmer, M. D. McGehee, Z. Bao, "Transistor and Solar Cell Performance of Donor-Acceptor Low Bandgap Copolymers bearing an Acenaphtho[2,3-*b*]thieno[3,4-*e*]pyrazine (ACTP) motif." *J. Mater. Chem.* 19, 591, **2009**.
65. M. E. Roberts, S. C. B Mannsfeld, **M. L. Tang**, Z. Bao, "Influence of Molecular Structure and Film Properties on the Water-Stability and Sensor Characteristics of Organic Transistors." *Chem. Mater.* 20, 7332, **2008**.
66. Q. Yuan, S. C. B Mannsfeld, **M. L. Tang**, M. E. Roberts, M. F. Toney, D. M. DeLongchamp, Z. Bao, "Microstructure of Oligofluorene Asymmetric Derivatives in Organic Thin Film Transistors." *Chem. Mater.* 20(8), 2763, **2008**.
67. Q. Yuan, S. C. B Mannsfeld, **M. L. Tang**, M. F. Toney, J. Luening, Z. Bao, "Thin Film Structure of

Tetraceno[2,3-*b*]thiophene Characterized by Grazing Incidence X-ray Scattering and Near-Edge X-ray Absorption Fine Structure Analysis." *J. Am. Chem. Soc.* 130(11), 3502, **2008**.

68. S. Sista, Y. Yao, Y. Yang, **M. L. Tang**, Z. Bao, "Enhancement in open circuit voltage through a cascade-type energy band structure." *Appl. Phys. Lett.* 91, 223508, **2007**.
69. A. Sung, M. M. Ling, **M. L. Tang**, Z. Bao, J. J. Locklin, "Correlating molecular structure to field-effect mobility: The investigation of side-chain functionality in phenylene - Thiophene oligomers and their application in field effect transistors." *Chem. Mater.* 19(9), 2342, **2007**.
70. T. Okamoto, M. L. Senatore, M. M. Ling, A. B. Mallik, **M. L. Tang**, Z. Bao, "Synthesis, characterization, and field-effect transistor performance of pentacene derivatives." *Adv. Mater.* 19(20), 3381, **2007**.

Invited Talks

Invited speaker: Electron Donor-Acceptor Interactions GRC (Aug. 2024); Invited speaker: The 245th Electrochemical Society (ECS) meeting, San Francisco (May 2024); Invited speaker: The 20th International Symposium on Silicon Chemistry, Hiroshima, Japan (May 2024); Invited speaker: ACS spring national meeting, New Orleans (Mar. 2024); Invited speaker: MATSUS Spring 2024 Conference, Barcelona, Spain (Mar. 2024); Invited speaker: Beilstein Nanotechnology Symposium on Nanocrystal Surfaces and Defects, Rüdeshheim, Germany (Oct. 2023); Trinity College Chemistry seminar (Oct. 2023); Lebanon Valley College Chemistry seminar (Oct. 2023); Trinity College Chemistry seminar (Oct. 2023); Utah State University Chemistry seminar (Sept. 2023); Kyushu Univ. Chemistry (Jun. 2023); UC Merced Chemistry seminar (Dec. 2022); San Jose State University Chemistry seminar (Oct. 2022); Keynote speaker: 3rd International Symposium on Singlet Fission and Photon Fusion, Università Milano Bicocca, Italy (Oct. 2022); SUNY Albany Chemistry seminar (Sept. 2022); American Chemical Society (ACS) fall national meeting in Chicago (Aug. 2022); Physical Chemistry of Interfaces and Nanomaterials XXI Conference, SPIE Optics + Photonics 2022 meeting in San Diego (Aug. 2022); Materials Research Society (MRS) spring national meeting in Hawai'i (May 2022); American Chemical Society (ACS) spring national meeting in San Diego (Mar. 2022) including the Florida State Univ. GSSPC, "Illuminating the Field of Photophysics: 101 Years of Michael Kasha"; Next Generation Solar Energy conference (NGSE6) organized by FAU, HI ERN, SAOT and NREL (Dec. 2021); Keynote speaker METANANO 2021 (Sept. 2021); nanoGe Spring Meeting 2021 (Mar. 2021); News in Nanocrystals (NiNC) internet seminar series (Sept. 2020); SPIE Organic Photonics + Electronics, San Diego (Aug. 2020); Luminescent silicon nanostructures Faraday Discussion, York, U.K. (Feb. 2020); nanoGe Fall Meeting, Berlin, Germany (Nov. 2019); The 17th International Symposium on Electroanalytical Chemistry (17th ISEAC), Changchun, China (Aug. 2019); Cavendish Laboratory, Univ. of Cambridge, Cambridge, U. K. (Jul. 2019); 14th International Symposium on Functional π -Electron Systems, Humboldt-Universität, Berlin, Germany (Jun. 2019); Univ. of Washington, Seattle, Inorganic Chemistry Seminar (Feb. 2019); UT Austin Inorganic Chemistry Seminar (Nov. 2018); Colloidal Semiconductor Nanocrystals Gordon Research Conference (GRC, Jul. 2018); UC Davis Chemistry Seminar (May 2018); Keynote opening speaker at the 2nd International Symposium on Singlet Fission and Photon Fusion: Emerging Solar Energy Technologies, Chalmers Univ. of Technology, Sweden (Apr. 2018); American Chemical Society (ACS) spring national meeting in New Orleans (Mar. 2018); 5th Center for Molecular Systems (CMS) International Symposium on Photochemistry and Materials Science for Energy, Kyushu University, Japan (Dec. 2017), Materials Research Society (MRS) Boston (Nov. 2017), WUSTL Chemistry Seminar (Sept. 2017), Notre Dame Chemistry Seminar (Sept. 2017), UIUC Materials Chemistry Seminar (Sept. 2017), Singlet Fission Workshop (Jun. 2017), Boston College Chemistry Seminar (May 2017), MIT Excitonics Seminar (May 2017), Univ. of Rochester Physical Chemistry Seminar (May 2017), UCSD Chemistry Physical/ Analytical Seminar (Apr. 2017), Bowling Green State University Chemistry Seminar (Mar. 2017), UCLA Inorganic Chemistry Seminar (Jan. 2017), Purdue University Organic Chemistry Seminar (Sept. 2016), Electron Donor-Acceptor Interactions GRC (Aug. 2016), ACS New Orleans (Aug. 2013)

Patents

1. **M. L. Tang**, Z. Huang, X. Li and M. Mahboub. "Acene-based transmitter molecules for photon upconversion". U.S. Patent No. 10,351,580 (2019).

- Z. Huang, X. Li, K. M. Hanson, **M. L. Tang**, C. J. Bardeen. "Hybrid molecule-nanocrystal photon upconversion across the visible and near-infrared". U.S. Patent No. 10,386,697, WO 2017/058326 A2 (2019).
- A. J. Maliakal, **M. L. Tang**, "Branched phenylene-terminated thiophene oligomers." Lucent Technologies, U.S. Patent No. 2007092752 (2007).

Advisees

Zhiyuan Huang and Xin Li (Chemistry Ph.D. Sept. 2017); Melika Mahboub (MSE Ph.D. Sept. 2018); Pan Xia (MSE Ph.D. Dec. 2019); Emily Moses (Chemistry Ph.D. Dec. 2020); Tingting Huang (5th year Chemistry), Kefu Wang (5th year Chemistry); Tsumugi Miyashita (5th year Biomedical engineering graduate student), Paulina Jaimes (3rd year Chemistry), Maryam Baraazandeh (2nd year Chemistry); Tian Qiao (postdoctoral fellow).

Professional Activities and Service

- Reviewer services** for journals like Reviewer for *ACS Physical Chemistry Au*, *ACS Nanoscience Au*, *ACS Sustainable Chemistry & Engineering*, *ACS Energy Letters*, *ACS Nano*, *ACS Photonics*, *ACS Applied Materials & Interfaces*, *Advanced Functional Materials*, *Advanced Materials*, *Analytical Chemistry*, *Angewandte Chemie International Edition*, *Applied Physics Letters*, *Chemical Reviews*, *Chemical Sciences*, *Chemistry of Materials*, *Chemical Communications*, *Dalton Transactions*, *Journal of the American Chemical Society*, *Journal of Physical Chemistry*, *Journal of Physical Chemistry C*, *Journal of Physical Chemistry Letters*, *Journal of Materials Chemistry C*, *Journal of Applied Physics*, *Matter*, *MRS Communications*, *New Journal of Chemistry*, *Nature Chemistry*, *Nature Communications*, *Nature Photonics*, *Nano Letters*, *Physical Chemistry Chemical Physics*, *Polymer Chemistry*, *Small*, *Synthetic Metals*, *RSC Advances*, *Optical Materials Express*; for proposals at the ACS PRF, NSF, ARO, AFoSR, DoE and Molecular Foundry Proposal Study Panel (PSP), National Science Centre Poland. Judge for Department of Defense 55th Junior Science and Humanities Symposium.
- Service to the broader scientific and engineering community:** Symposium co-organizer for the 4th International Symposium on Singlet Fission and Photon Fusion 2024 (New York, NY); Materials Research Society's (MRS) 2023 Spring Meeting Symposium EL07; Symposium co-organizer for Pacificchem 2021; Panelist for NSF CHE Virtual Office Hour Nov. 13th 2020; Symposium co-organizer for the Materials Research Society's (MRS) 2019 Spring Meeting, 2015 Spring Meeting; presider for Symposium OO for the MRS 2016 Spring Meeting; presider for Symposium NM for the MRS 2017 Fall Meeting; presider for INOR symposium: Chemistry of Materials: Nanomaterials for the American Chemical Society's 2016 Fall Meeting in Philadelphia, PA.
- Service on key UC Riverside committees:** Current campus-wide committees (2020-2021): UCR Faculty Senate's Committee on Courses (Chair from Sept. 2020), the Provosts' Strategic Planning Committee on Research and Scholarly Distinction (member from Sept. 2019), Promoting Research Objectivity (PRO) committee (member from Sept. 2020). Previously: Departmental: Materials Search Committee, Graduate Studies Committee & the Chemistry Department Safety Committee; Campus-wide: Early Childcare Service Parents Taskforce, Research & Economic Development Advisory Committee, Center for Nanoscale Science and Engineering Planning and Vision Committee. **Service on key Univ. of Utah committees:** Graduate Admissions committee (2021-present; Chair since 2022), Seminar committee (2021-present); Graduate Recruiting committee (2022-present).
- Outreach to K-6 students** in Riverside Unified School District (RUSD), e.g. Science Club activities at Bryant Elementary and UC Riverside's Early Childhood Services every Fall since 2018.
- Outreach to Congress:** April 2019: as part of a UC delegation organized by Federal Governmental Relations, participated in the Coalition for National Science Foundation (CNSF) annual exhibition and Hill day in Washington, D.C. Alongside faculty representatives from UCSB, UCLA, UCSC, UCI and UCF, showcased NSF-funded research taking place at UCR and met with Congressional Members and their staff (including the

offices of Senators Harris and Feinstein, and House Representative Takano, etc).

Member of the American Chemical Society, the Materials Research Society and the SPIE.

Ming Lee Tang, Associate Professor, Department of Chemistry, University of Utah.

Current and Pending Support

Current Support (as PI)

| | |
|---|-------------------------|
| FA9550-23-1-0146 | 05/01/2023- 04/30/2024 |
| Air Force Office of Scientific Research | \$373,368 |
| Title: Quantifying the Optical Rotation of Light by Chiral Plasmonic Nanostructures | |
| DE-SC0022523-Early Career Research Program | 02/01/2022- 01/31/2024 |
| Department of Energy | \$387,974 |
| Title: Splitting photons: Singlet fission in nanocrystal-molecule hybrid structures | |
| OISE- 2142762 | 07/01/2021 – 9/30/2024 |
| National Science Foundation | \$208,647 |
| Title: IRES Track 1: Self-assembled liquids and thin films for efficient photon upconversion with triplet excitons in air | |
| CHE- 2147792 | 09/01/2021 – 08/31/2025 |
| National Science Foundation | \$570,000 |
| Title: Plasmon-induced triplet energy transfer (PITET) for photon upconversion. | |

Current Support (as co-PI)

| | |
|---|------------------------------------|
| CMMI- 2053567 | 8/01/2021 – 7/31/2026 |
| National Science Foundation | \$2,000,000 (\$500,000 to PI Tang) |
| Title: LEAP-HI: Manufacturing of Silicon-based Hybrid Organic-Inorganic Quantum Building Blocks | |
| FA9550-20-1-0112 | 06/01/2020 – 06/02/2024 |
| Air Force Research Laboratory | \$600,000 (\$580,000 to PI Tang) |
| Title: Spin-doublet exciton exchange in hybrid organic- quantum dot nanostructures. | |
| Proposal ID: 277934 | 01/01/2024- 08/31/2024 |
| Department of Energy | \$12,000 |
| Title: The 4th International Symposium on Singlet Fission and Photon Fusion (ISPF2) | |

Ming Lee Tang, Associate Professor, Department of Chemistry, University of Utah.

Past Support (as PI)

IIP- 2147791 07/01/2021 – 10/31/2023
National Science Foundation \$188,182
Title: PFI-TT: Achieving efficient production of visible light from semiconductor nanocrystals in water.

FA9550-19-1-0092 4/15/2019 – 4/14/2021
Office of Scientific Research (AFOSR) \$372,359
Title: Mapping excitons with high temporal dynamic range from the UV to the NIR

FG-2017-9559 9/15/2017 – 9/14/2019
Alfred P. Sloan Foundation \$60,000
Sloan Research Fellowship in Chemistry

IIP-1839049 07/15/2018 – 6/30/2019
National Science Foundation \$50,000
Title: I-Corps: Hybrid Halos for Biological Markers, Probes and Therapies

17-1_Tang_UCR 10/1/2017 – 9/31/2019
Samsung Global Research Outreach (GRO) \$199,704
Title: Fluorinating QDs to control band offsets and promote electronic coupling

CHE-1351663 5/1/2014 – 4/31/2019
National Science Foundation \$671,683
Title: CAREER: Tuning optical responses in artificial molecules of monovalent gold nanocrystals

W911NF-15-1-0040 2/1/2015 – 1/31/2016
Department of Army \$449,231
Title: Singlet-fission-sensitized hybrid thin-films for next-generation photovoltaics

W911NF-16-1-0523 9/01/2016 – 8/31/2017
Department of Defense \$493,914
Title: Plasmonic nanocrystals for enhanced hybrid photon upconversion

W911NF-14-1-0260 6/12/2014- 2/08/2018
Department of Army \$211,000
Title: Nanoparticle clusters with magnetic plasmons at visible frequencies

Past Support (as co-PI)

Office of Postsecondary Education 10/01/2018 – 09/30/2021
Department of Education \$895,500
Title: GAANN Fellowships in Material Science and Engineering

CHE-1828782 06/20/2018 – 06/19/2021
National Science Foundation \$258,797
Title: MRI: Acquisition of a Hybrid Supercritical Chromatography, High-Pressure Chromatograph, Quadrupole-Time-of-Flight Mass Spectrometer (SFC/UHPLC Q-ToF/MS)

List of Individuals for Letters of Support

1. Susan Kauzlarich
Distinguished Professor of Chemistry
ACS and AAAS Fellow
PAESMEM 2008
UC Davis
smkauzlarich@ucdavis.edu
pronouns: She/her/hers
Deputy Editor | Science Advances (AAAS)
2. Marc Baldo
Dugald C. Jackson Professor of Electrical Engineering
Director for the Research Laboratory of Electronics (RLE)
MIT
baldo@mit.edu
pronouns: He/him