

## CURRICULA VITAE

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### Ming Lee Tang

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#### **Education and Training**

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: >6800; H-index: 42.

#### **Publications** (undergraduate/ high school student contributors underlined)

1. 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 Chemistry*, **in press**.
2. 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**.
3. 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**.
4. 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)
5. 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**.
6. 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**.

7. P. Xia, J. Schwan, T. W. Dugger, L. Mangolini, **M. L. Tang**, " Air-Stable Silicon Nanocrystal-Based Photon Upconversion", *Adv. Optical Mater.*, 2100453, **2021**.
8. 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)
9. 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**.
10. 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**.
11. 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**.
12. 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**.
13. 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**.
14. 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**.
15. 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**.
16. 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**.
17. 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)
18. 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**.
19. 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).
20. 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**.
21. 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**.
22. 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**.
23. 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**.
24. 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**.
25. Z. Huang, **M. L. Tang**, "Designing molecular transmitters for efficient energy transfer between nanocrystals" *J. Am. Chem. Soc.*, 139, 9412, **2017** (invited Perspective).
26. 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**.

27. X. Li, **M. L. Tang**, " Triplet transport in thin films: fundamentals and applications " *Chem. Comm.*, 53, 4429, **2017** (invited Feature Article).
28. 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**.
29. 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**.
30. M. Mahboub, Z. Huang, **M. L. Tang**, "Efficient Infrared-to-Visible Upconversion with Sub-Solar Irradiance" *Nano Lett.*, 16, 7169, **2016**.
31. 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**.
32. 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**.
33. 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**.
34. 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**.
35. 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**.
36. 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.*
37. 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**.
38. 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**.
39. 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

40. **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 MoS<sub>3</sub> 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".)
41. **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**.
42. 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).
43. **M. L. Tang**, Z. Bao, "Halogenated Materials as Organic Semiconductors." *Chem. Mater.* 22, 446, **2011**.
44. **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**.
45. **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**.

46. **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**.
47. **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**.
48. **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**.
49. **M. L. Tang**, A. D. Reichardt, T. Okamoto, N. Miyaki, Z. Bao, "Functionalized Aymmetric Linear Acenes for High Performance Organic Semiconductors." *Adv. Func. Mater.* 18, 1579, **2008**.
50. **M. L. Tang**, T. Okamoto, Z. Bao, "High-Performance Organic Semiconductors: Asymmetric Linear Acenes Containing Sulphur." *J. Am. Chem. Soc.* 128(50), 16002, **2006**.
51. **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)

52. 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**.
53. 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**.
54. 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**.
55. 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**.
56. 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**.
57. 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**.
58. 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**.
59. 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**.
60. 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**.
61. 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**.
62. 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**.
63. 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**.
64. 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**.
65. 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**.

66. 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**

Keynote Lecture/ Lectureship Award at Asia International Symposium, Annual Meeting of the Chemical Society of Japan (CSJ, Mar. 2023); UC Merced Department of Chemistry seminar (Dec. 2022); San Jose State University Department of Chemistry seminar (Oct. 2022); Keynote speaker: 3rd International Symposium on Singlet Fission and Photon Fusion, Università Milano Bicocca, Italy (Oct. 2022); SUNY Albany Department of 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 17<sup>th</sup> International Symposium on Electroanalytical Chemistry (17th ISEAC), Changchun, China (Aug. 2019); Cavendish Laboratory, Univ. of Cambridge, Cambridge, U. K. (Jul. 2019); 14<sup>th</sup> International Symposium on Functional  $\pi$ -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); 5<sup>th</sup> 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 (Jul. 2019).
2. 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 (Aug. 2019).
3. A. J. Maliakal, **M. L. Tang**, "Branched phenylene-terminated thiophene oligomers." Lucent Technologies, U.S. Patent No. 2007092752 (Apr. 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 (4<sup>th</sup> year Chemistry), Kefu Wang (4<sup>th</sup> year Chemistry); Tsumugi Miyashita (4<sup>th</sup> year Biomedical engineering graduate student), Paulina Jaimes (2<sup>nd</sup> year Chemistry).

### ***Professional Activities and Service***

1. **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.
2. **Service to the broader scientific and engineering community**: Symposium co-organizer for the 4<sup>th</sup> International Symposium on Singlet Fission and Photon Fusion 2024; Materials Research Society's (MRS) 2023 Spring Meeting Symposium EL07; Symposium co-organizer for Pacifichem 2021; Panelist for NSF CHE Virtual Office Hour Nov. 13<sup>th</sup> 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.
3. **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**: Admissions committee, Seminar committee.
4. **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.
5. **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)***

22RT0671	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	
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.	
CHE- 2147792	09/01/2021 – 08/31/2024
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.	

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

***Past Support (as PI)***

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)