**Curriculum Vitae**

**Chen Yang**

Department of Electrical & Computer Engineering and Department of Chemistry

Boston University

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**EDUCATION**

**Ph.D. in Chemistry**, 2006, Harvard University, Cambridge, MA

Thesis Title: Modulation Doped Nanowires for Nanoelectronics and Nanophotonics

Advisor: Charles. M. Lieber

**M.Phil. in Chemistry**, 2001, Hong Kong University of Science and Technology, Hong Kong, China

Thesis Title: Quantum Dissipation Theory and Its Application to Transient Absorption

Advisor: Yijing Yan

**B.S. in Chemical Physics**, 1999, University of Science and Technology of China, Hefei, China

Thesis Title: Molecular Localized Excitation by Optimal Fields

Advisor: Qingshi Zhu

**PROFESSIONAL EXPERIENCE**

2024-present, Professor

Department of Electrical & Computer Engineering and Department of Chemistry, Boston University, Boston, MA. Secondary appointment, Division of Material Science and Engineering, Boston University, Boston, MA.

2020-present, Associate Chair

Department of Electrical & Computer Engineering, Boston University, Boston, MA

2017-2024 Associate Professor,

Department of Electrical & Computer Engineering and Department of Chemistry, Boston University, Boston, MA. Secondary appointment, Division of Material Science and Engineering, Boston University, Boston, MA.

2013-2017, Associate Professor,

Department of Chemistry and Department of Physics and Astronomy, Purdue University, West Lafayette, IN

2007-2013, Assistant Professor,

Department of Chemistry and Department of Physics and Astronomy, Purdue University, West Lafayette, IN

2006-2007, Associate,

McKinsey & Co, Philadelphia, PA

**AWARDS**

Elected AIMBE (American Institute for Medical and Biological Engineering) Fellow (since 2023)

Boston University Ignition Award, 2021

Purdue University Outstanding Ph.D. Advisor Award, 2014

CAREER Award from the National Science Foundation, 2009

Seeds of Success Award, Purdue University, 2008

**PROFESSIONAL AND SCHOLAR LEADERSHIP**

Science Advisor of Axorus (since 2022) [link](https://www.axorus.com/#team)

Topical Advisory Panel of *Materials* (since 2020) [link](https://www.mdpi.com/journal/materials/topical_advisory_panel)

Guest editor of *Molecules*, *Special issue in Nanoscale Wires: Synthesis, Characterization, and Applications*

(2018) [link](https://www.mdpi.com/journal/molecules/special_issues/NW)

Guest editor of *Journal of Electronic Materials*, *Special issue for 2011 Electronic Material Conference*

(2012) [link](https://link.springer.com/journal/11664/volumes-and-issues/41-5)

**PROFESSIONAL SOCIETY MEMBERSHIP**

Member of American Chemical Society

Member of Materials Research Society

Member of SPIE

**PUBLICATIONS**

† Corresponding author

Name: first author or equally contribution first author advised and supported by me.

**Manuscript submitted at BU**

1. Carolyn Marar, Ying Jiang, Yueming Li, Lu Lan, Nan Zheng, **Chen Yang**†, Ji-Xin Cheng†, “Wireless Neuromodulation at Submillimeter Precision via a Microwave Split-Ring Resonator”, under review, 2024 *BioRxiv* [-Link-](https://www.biorxiv.org/content/10.1101/2022.07.22.501150v1.full)
2. Zhiyi Du, Guo Cheng, Yueming Li, Nan Zheng, Ji-Xin Cheng and **Chen Yang**†, “Photoacoustic: A Versatile Non-genetic Method for High Precision Neuromodulation”, invited, submitted, *Accounts of Chemical Research*, 2024
3. Zhiyi Du, Mingsheng Li, Guo Cheng, Maijie Xiang, Danchen Jia, Ji-Xin Cheng†, **Chen Yang†**, “Mid-infrared Photoacoustic Stimulation of Neurons through Vibrational Excitation in Polydimethylsiloxane”, submitted, 2024
4. Guo Chen, Feiyuan Yu, Linli Shi, Carolyn Marar, Zhiyi Du, Danchen Jia, Ji-Xin Cheng†, **Chen Yang†**, “High-precision photoacoustic neural modulation uses a non-thermal mechanism”, submitted, 2024.

**Peer Reviewed Journal Articles Published at BU**

1. Nan Zheng, Ying Jiang, Shan Jiang, Jason Kim, Yueming Li, Ji-Xin Cheng, Xiaoting Jia†, **Chen Yang**†, “Multifunctional fiber-based optoacoustic emitter for non-genetic bidirectional neural interface”, *Advanced Healthcare Materials*, 2300430 (2023)
2. Ran Cheng, Danchen Jia, Zhiyi Du, Ji-Xin Cheng, **Chen Yang†**, “Gap-Enhanced Gold Nanodumbbell with Single-Particle Surface Enhanced Raman Scattering Sensitivity”, *RSC Advances*, in press (2023)
3. Guo Chen, Linli Shi, Lu Lan, Runyu Wang, Yueming Li, Zhiyi Du, Mackenzie Hyman, Ji-Xin Cheng, **Chen Yang**†, “High-precision neural stimulation by a highly efficient candle soot fiber optoacoustic emitter”, *Frontiers in Neuroscience* 16:1005810 (2022)
4. Yueming Li, Ying Jiang, Lu Lan, Xiaowei Ge, Ran Cheng, Yuewei Zhan, Linli Shi, Nan Zheng, Guo Chen, Runyu Wang, **Chen Yang**†, Ji-Xin Cheng†, “Noninvasive Submillimeter-Precision Brain Stimulation by Optically-Driven Focused Ultrasound”, Light Science & Applications, 11:321 (2022). Highlighted by *EurekAlert by AAAS* and DeepTech.
5. Linli Shi, Ying Jiang, Nan Zheng, Ji-Xin Cheng, and **Chen Yang**†, “High-precision neural stimulation through optoacoustic emitters”, invited, 9, 032207, *Neurophotonics*, (2022). Highlighted by *SPIE News*
6. Cheng Zong, Ran Cheng, Fukai Chen, Peng Lin, Meng Zhang, Zhicong Chen, Chuan Li, **Chen Yang**, Ji-Xin Cheng†, *“*Wide-field Surface-enhanced Coherent Anti-Stokes Raman Scattering Microscopy”, ACS Photonics, 9, 1042–1049, (2022)
7. Nan Zheng, Vincent Fitzpatrick, Ran Cheng, Linli Shi, David L. Kaplan, and **Chen Yang**†, “Photoacoustic Silk Scaffolds for Neural Stimulation and Regeneration”, ACS Nano, 16, 2, 2292–2305 (2022). Highlighted by *Advances in Engineering* and *DeepTech*
8. Linli Shi, Ying Jiang, Fernando R. Fernandez, Lu Lan, Guo Chen, Heng-Ye Man, John A. White, Ji-Xin Cheng, **Chen Yang**†, “Non-genetic acoustic stimulation of single neurons by a tapered fiber optoacoustic emitter”, *Light Science & Applications*, 10, 143 (2021). Highlighted by *Medical Express*
9. Ying Jiang, Yimin Huang, Xuyi Luo, Jiayingzi Wu, Haonan Zong, Linli Shi, Ran Cheng, Shan Jiang, Xiaoting Jia, Jianguo Mei, Heng-Ye Man, Ji-Xin Cheng, **Chen Yang**†, “Neural Stimulation in vitro and in vivo by Photoacoustic Nanotransducers”, *Matter*, 4, 654 (2021)
10. Cheng Zong, Yurun Xie, Meng Zhang, Yimin Huang, **Chen Yang**, and Ji-Xin Cheng†, “Plasmon-enhanced coherent anti-stokes Raman scattering vs plasmon-enhanced stimulated Raman scattering: Comparison of line shape and enhancement factor”, *Journal of Chemical Physics* 154, 034201 (2021)
11. Amartya Dutta, Brian Pihuleac, Yuyao Chen, Cheng Zong, Luca Dal Negro, **Chen Yang**†, “Au@SiO2@Au Core-Shell-Shell Nanoparticles for Enhancing Photocatalytic Activity of Hematite”, *Material Today Energy*, 19, 100576 (2021)
12. L. Shi, Y. Jiang, L. Lan, Y. Zhang, Y. Huang, J.X. Cheng, **C. Yang**†, “A Fiber Optoacoustic Emitter with Controlled Ultrasound Frequency for Cell Membrane Sonoporation at Submillimeter Spatial Resolution”, *Photoacoustics*, 20, 100208 (2020)
13. Y. Huang, V. Fitzpatrick, N. Zheng, R. Cheng, H. Huang, C. Ghezzi, D.L. Kaplan, **C. Yang**†, “Self-folding 3D silk biomaterial rolls to facilitate axon and bone regeneration”, *Advanced Healthcare Materials,* 9, 2000530 (2020)
14. K. Hansen, M. Cardona, A. Dutta, **C. Yang**†, “Plasma enhanced atomic layer deposition of plasmonic TiN ultrathin films using TDMATi and NH3”, *Materials*, 13(5), 1058, (2020)
15. Y. Jiang, H. J. Lee, L. Lan, H. Tseng, **C. Yang**, H-Y. Man, X. Han and J-X Cheng†, “Optoacoustic Brain Stimulation at Submillimeter Spatial Precision”, *Nature Communications*, 11, 881 (2020)
16. C. Zong, R. Premasiri, H. Lin, Y. Huang, C. Zhang, **C. Yang**, B. Ren, L. D. Ziegler, and J-X Cheng†. “Detection of Single Molecules with Plasmon-enhanced Stimulated Raman Scattering Microscopy”, *Nature Communication*, 10, 5318, 2019.
17. K. Hansen, A. Dutta, M. Cardona, **C. Yang**†, “Zirconium Nitride for Plasmonic Cloaking of Visible Photodetector Nanowires” *Plasmonics*, 15, 1231–1241 (2020)
18. A. Dutta, S. Ramadurgam and **C. Yang**†, “Plasmonic Core-Multi-Shell Nanowire Phosphors for Light Emitting Diodes “, *ACS Photonics* DOI: 10.1021/acsphotonics.8b00069 (2018)
19. M. P. Cardona, M. Li, W. Li, J. McCall, D. Wang, Y. Li and **C. Yang**†, “The Role of Graphene as an Overlayer on Nanostructured Hematite Photoanodes for Improved Solar Water Oxidation”, *Material Today Energy* 8, 8-14 (2018)
20. Y. Huang, Y. Jiang, O. Wu, X. An, A. A. Chubykin, J-X. Cheng, X-M. Xu and **C. Yang**†, “Nanoladders Facilitate Directional Axonal Outgrowth and Regeneration”, *ACS Biomaterials Science and Engineering* 4, 3,1037-1045, (2018)
21. K-C Huang, J. McCall, P. Wang, C-S Liao, G. Eakins, J-X Cheng and **C. Yang**†, “High-speed Spectroscopic Transient Absorption Imaging of Defects in Graphene”, *Nano Letters*, 18, 2, 1489-1497

(2018).

**Peer Reviewed Journals Published Before BU**

1. K. McNear, Y. Huang, **C. Yang**†, "Understanding Cellular Internalization Pathways of Silicon Nanowires", *Journal of Nanobiotechnology* 15:17 (2017).
2. T.G. Lin, S. Ramadurgam and **C. Yang**†, “Design of Contact Electrodes for Semiconductor Nanowire Solar Harvesting Devices”, *Nano Lett.*, 17, 4, 2118-2215(2017)
3. Y. Zi, S. Suslov, C. Yang, “Understanding Self-Catalyzed Epitaxial Growth of III–V Nanowires toward Controlled Synthesis”, *Nano Lett.*, *17* (2), 1167–1173 (2017)
4. Y. Hu, J. Li, B. Deng, J. Tian, K. McNear, Y. Xuan, Y. P. Chen, **C. Yang**, G. Cheng†, "Parallel nanoshaping of brittle semiconductor nanowires for strained electronics", Nano Lett, 16, 7536–7544 (2016)
5. N. Opondo, S. Ramadurgam, **C. Yang**, and S. Mohammadi†, “Trap Studies in Silicon Nanowire Junctionless Transistors using Low Frequency Noise”, *Journal of Vacuum Science and Technology* B 34, 011804 (2016).
6. Tzu-ging Lin, S. Ramadurgam, Y. Zi and **C. Yang**†, “Fabrication of Sub-25 nm GaSb Nanopillar Arrays by Nanoscale Self-mask Effect”, *Nano Letters*, 15, 4993-5000 (2015)
7. J. Li, W. Zhang, T-F Chung, M.N. Slipchenko, Y. P. Chen, J-X Cheng, **C. Yang**†, "Highly sensitive transient absorption imaging of graphene and graphene oxide in living cells and circulating blood", *Scientific Reports,* 5:12394 (2015).
8. S. Ramadurgam, **C. Yang**†, “Tailoring Optical and Plasmon Resonances in Core-Shell and Core-Multishell Nanowires for Visible Range Negative Refraction and Plasmonic Light Harvesting: A Review”, invited review, *Journal of Material Science and Technology*, special issue on 1D Nanomaterials, 31, 533-541 (2015)
9. S. Ramadurgam, T. Lin and C. Yang†, “Aluminum Plasmonics for Enhanced Visible Light Absorption and High Efficiency Water Splitting in Core–Multishell Nanowire Photoelectrodes with Ultrathin Hematite Shells”, *Nano Letters*, 14, 4517-4522 (2014)
10. S. Ramadurgam, C. Yang†, “Semiconductor-Metal-Semiconductor Core- Multishell Nanowires as Negative-Index Metamaterial in Visible Domain”, *Scientific Reports* 4:4931, doi:10.1038/srep04931 (2014).
11. C.J. Delker, Y. Zi, **C. Yang**, D. Janes**†, “**Current and noise properties of InAs nanowire transistors with asymmetric contacts induced by gate overlap,” Electron Devices, IEEE Transactions on, (99), 1-6 (2014)
12. W. Zhang, K. McNear, S. Lee, T. F. Chung, S. Lee, K. Lee, Z. Zhong, Y. Chen and **C. Yang**†, “Graphene: a Biocompatible Protection Film for Metal,” *Scientific Reports* 4:4097, doi: 10.1038/srep04097(2014)
13. S. H. Chung, S. Ramadurgam and **C.Yang**†, “Effects of Dopants on Epitaxial Growth of Silicon Nanowires on Silicon Substrates,” invited paper, *Nanomaterials and Nanotechnology* 4:3. doi: 10.5772/58317 (2014).
14. C.J. Delker, Y. Zi, **C. Yang**, D.B. Janes†, “Low-Frequency Noise Contributions from Channel and Contacts in InAs Nanowire Transistors,” Electron Devices, IEEE Transactions on, 60 (9), 2900-2905 (2013).
15. Y. Zi, K. Jun, D.N. Zakharov, and **C. Yang**†, “Understanding Self Aligned Planar growth of InAs Nanowires,” *Nano Letters*, 13, 2786–2791 (2013).
16. P. Wang, M. N. Slipchenko, J. Mitchell, **C. Yang**, E. O. Potma, X. Xu, J. Cheng†, “Far-field imaging of non-fluorescent species with sub-diffraction resolution,” *Nature Photonics*, 7, 449–453 (2013).
17. H. Bao, W. Zhang, L. Chen H. Huang, **C. Yang** and X. Ruan†, “An investigation of the optical properties of disordered silicon nanowire mats,” *Journal of Applied Physics*, 112, 124301 (2012).
18. Y. Zhao, D. Candebat; C. Delker; Y. Zi, D. Janes, J. Appenzeller and **C. Yang**†, “Understanding the Impact of Schottky Barriers on the Performance of Narrow Bandgap Nanowire Field Effect Transistors,” *Nano Letters*, 12, 5331-5336 (2012)
19. Y. Zi, Y. Zhao, D. Candebat, J. Appenzeller, and **C. Yang**†, “Synthesis of High Quality Antimony Based Nanowires Using Simple Vapor Deposition,” invited paper, *ChemPhysChem*, 13, 2585-2588 (2012)
20. W. Zhang, L. Tong, and **C. Yang**†, “Cellular Response to 1D Functionalized Silicon Nanowires”, *Nano Letters* 12, 1002–1006 (2012)
21. S. J. Park, S. H. Chung, B. J. Kim, M. Qi, X. Xu, E. A. Stach,and **C. Yang**†, “Mechanism of vertical Ge nanowire nucleation on Si (111) during sub-eutectic annealing and growth”, *Journal of Materials Research*, 26, 2744-2748 (2011)
22. M. R. Nelis, L. Yu, W. Zhang, Y. Zhao, **C. Yang**, A. Raman, S. Mohammadi, and J. Rhoads†, “Resonant Mode Splitting in Silicon Nanowire Devices: Sources and Practical Implications”, N*anotechnology* 22, 455502 (2011)
23. J. Mitchell, S. Park, M. Qi, P. Srisungsitthisunti, E. Stach, C. Tansarawiput, C. Watson, **C. Yang**, and X. Xu†, "Laser direct write of silicon nanowires," *Optical Engineering* 50, 104301 (2011)
24. N. Lin, W. Zhang, B.M. Koshel, J.X. Cheng, and **C. Yang**†, “Spatially Modulated Two Photo Luminescence From Si-Au Core-Shell Nanowires”, *Journal of Physical Chemistry C*, 115, 3198-3202(2011)
25. Y. Zhao, J.T. Smith, J. Appenzeller, and **C. Yang**†, “Transport Modulation in Ge/Si Core/Shell Nanowires through Controlled Synthesis of Doped Si Shells”, *Nano Letters*, 11, 1406-1411 (2011)
26. Y. Jung, M. N. Slipchenko, C.H. Liu, A.E. Ribbs, Z. Zhong, **C. Yang**, J.X. Cheng†, “Fast Detection of the Metallic State of Individual Single-Walled Carbon Nanotubes Using a Transient-Absorption Optical Microscope”, *Physics Review Letters*, **105**, 217401 (2010)
27. Y. Jung, L. Tong, A. Tanaudommongkon, J.X. Cheng, and **C. Yang**†, “In Vitro and In Vivo Nonlinear Optical Imaging of Silicon Nanowires,” Nano Letters 9, 2440-2444 (2009)
28. **C. Yang**, C. J. Barrelet, F. Capasso and C. M. Lieber, “Single p-Type/Intrinsic/n-Type Silicon Nanowire as Nanoscale Avalanche Photodetectors,” *Nano letters* 6, 2929-2934 (2006)
29. **C. Yang**, Z. Zhong and C.M. Lieber, “Encoding Information through Synthesis in Modulation-Doped Nanowire Structures,” *Science*, 310, 1304-1307 (2005)
30. Y. Wu, J. Xiang, **C. Yang**, W. Lu and C. M. Lieber, “Single-crystal metallic nanowires and metal/semiconductor nanowire heterostructures,” *Nature* 430, 61-65 (2004)
31. D. Wang, F. Qian, **C. Yang**, Z. Zhong and C. M. Lieber, “Rational Growth of Branched and Hyperbranched Nanowire Structures,” *Nano Letters* 4, 871-874 (2004)
32. F. Shuang, **C. Yang** and Y. J. Yan, “[Dynamical semigroup Fokker-Planck equation approach to transient absorption and fluorescence upconversion spectroscopies](http://wos02.isiknowledge.com.ezp3.harvard.edu/?SID=1@eCgbd@cCEKLI2FaLA&Func=Abstract&doc=2/3),” *Journal of Chemical Physics* 114, 3868-3879 (2001)
33. **C. Yang**, F. Shuang and Y.J. Yan, “[Generalized Redfield theory and its application to transient absorption spectroscopies of molecules in condensed phases](http://wos02.isiknowledge.com.ezp3.harvard.edu/?SID=1@eCgbd@cCEKLI2FaLA&Func=Abstract&doc=2/6),” *Journal of the Chinese Chemical Society* 47 (4A), 799-805 (2000)
34. Y. J. Yan, F. Shuang, R. X. Xu, J. X. Cheng, X. Q. Li, **C.** [**Yang**](http://wos17.isiknowledge.com.ezp1.harvard.edu/CIW.cgi?SID=W2DiPaDGnid92i6pcoL&Func=OneClickSearch&field=AU&val=Yang+C&curr_doc=1/2&Form=FullRecordPage&doc=1/2), H. Y. Zhang, “Unified approach to the Bloch-Redfield theory and quantum Fokker-Planck equations,” *Journal of Chemical Physics* 113, 2068-2078 (2000)
35. F. Shuang , **C. Yang**, H. Zhang, et al. “[Cooperativity and resonances in periodically driven spin-boson systems](http://wos02.isiknowledge.com.ezp3.harvard.edu/?SID=1@eCgbd@cCEKLI2FaLA&Func=Abstract&doc=2/8),” *Physical Review E* 61, 7192-7195 (2000)
36. **C. Yang**, J. Cheng, Q. Zhu, “[Molecular localized excitation by optimal fields](http://wos02.isiknowledge.com.ezp3.harvard.edu/?SID=1@eCgbd@cCEKLI2FaLA&Func=Abstract&doc=6/2),” *Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy* 55, 2399-2402 (1999)

**Peer Reviewed Conference Proceeding**

1. S. Ramadurgam, **C.Yang**†, “Aluminum and Copper Plasmonics for Enhancing Internal Quantum Efficiency of Core-Shell and Core-Multishell Nanowire Photoelectrodes”, *Proceedings of SPIE: Nanophotonics Materials*, volume 9161, ISBN: 9781628411881 (2014)
2. C.J. Delker, Y. Zi, **C. Yang**, and D.B. Janes†, “Temperature dependence of current and low-frequency noise in InAs nanowire transistors,” 71st Device Research Conference (DRC), ISBN: 978-1-4799-0811-0, 57 - 58 (2013).
3. J. T. Smith, Y. Zhao, **C. Yang**, and J. Appenzeller†, “Effects of Nanoscale Contacts to Silicon Nanowires on Contact Resistance: Characterization and Modeling,” 68th Device Research Conference (DRC), ISBN: 978-1-4244-6562-0, pp. 139-140 (2010).
4. J. T. Smith, Y. Zhao, A. Razavieh, **C. Yang**, and J. Appenzeller†, “Ge/Si Core/Shell Nanowire Structures for Tunneling Devices,” 218th Electrochemical Society (ECS) Transactions, 33(6), pp. 707-714 (2010).
5. Y. Jung, N. Lin, **C. Yang**, J.X. Cheng†, “Photothermal heterodyne phase imaging of gold seed and germanium nanowire”, SPIE: Photons and Ultrasound: Imaging and Sensing 2010, volume 7564, ISBN: 9780819479600 (2010)
6. D. Candebat, Y. Zhao, C. Sandow, B. Koshel, **C. Yang**, and J. Appenzeller†, “InSb nanowire field-effect transistors-electrical characterization and material analysis”, 67th Device Research Conference ISBN: 978-1-4244-3528-9, 13-14 (2009).

**BOOK AND BOOK CHAPTERS**

**At BU**

1. W. Zhang and **C. Yang**, “Functional semiconducting silicon nanowires for cellular binding and internalization”, *Semiconducting Silicon Nanowires for Biomedical Applications*,2nd Edition, ISBN 9780128213513, (Ed. J. L. Coffer, Woodhead Publishing 2021).

**Before BU**

1. W. Zhang and **C. Yang**, “Functional Silicon Nanowires for Cellular Binding and Internalization,” *Semiconducting Silicon Nanowires for Biomedical Applications*, ISBN 978-0-85709-766-8, (Ed. J. L. Coffer, Woodhead Publishing, 2014).
2. Z. Zhong, **C. Yang** and C. M. Lieber, “Silicon Nanowires and Nanowire Heterostructures,**”** *Nanosilicon*, 176-216 (Ed. V. Kumar, Elsevier, 2008).

**PATENTS**

**At BU**

1. Neural Stimulation In Vitro And In Vivo By Photoacoustic Nanotransducers. Patent No.: 18/103,093 filed on January 30, 2023. Inventor: **Chen Yang**, Ji-Xin Cheng, Ying Jiang, Yimin Huang, Zhiyi Du
2. Wireless Neuromodulation Via Microwave Split Ring Resonator. Patent No. 63/185,385 filed on May 5, 2022. Inventor: **Chen Yang**, Ji-Xin Cheng, Nan Zheng, Linli Shi, Yueming Li, Ying Jiang, Lu Lan
3. Methods and Devices for Optoacoustic Stimulation. US Patent No. 11,684,404 B2 Issued on Jun 27, 2023 Inventor: **Chen Yang**, Ji-Xin Cheng, Nan Zheng, Linli Shi, Yueming Li, Ying Jiang, Lu Lan

**Before BU**

1. Nanostructures Containing Metal Semiconductor Compounds. Patent No. 20090227107 filed on February 14, 2005, Inventor: Charles M. Lieber, Yue Wu, Jie Xiang, **Chen Yang**, Wei Lu

**MEDIA COVERAGE OF WORK**

1. *SPIE Photonics West Preview*, cover story, “A Lab Linking Light and Sound Creates in Safer, Noninvasive Brain Investigations”, Jan 28, 2023
2. SPIE Photonics West BiOs Featured Speakers [link](https://spie.org/conferences-and-exhibitions/photonics-west/program/conferences/bios)
3. *EurekAlert by AAAS,* “Optically-generated Focused Ultrasound for Noninvasive Brain Stimulation with Ultrahigh Precision”, 2022 [link](https://www.eurekalert.org/news-releases/970247)
4. *SPIE News*, “Optoacoustics for high-precision neuromodulation”, 2022 [link](https://spie.org/news/optoacoustics-for-high-precision-neuromodulation)
5. Neurotech reports, “Optoacoustic Neuromodulation Offers a New Modality”, 2022 [link](file:///Users/chenyang/Documents/CV%20evaluation%20/Full%20Professor%20promotion/Optoacoustic%20Neuromodulation%20Offers%20a%20New%20Modality)
6. *Advances in Engineering*, “Soft and Biocompatible Photoacoustic Scaffolds for Wireless Neural Stimulation and Regeneration”, 2022 [link](https://advanceseng.com/soft-biocompatible-photoacoustic-scaffolds-wireless-neural-stimulation-regeneration/)
7. *MIT Technology Review China (DeepTech)*,“Photoacoustic neural stimulation and regeneration”, 2022
8. *Medical Express,* “Non-genetic photoacoustic stimulation of single neurons by a tapered fiber optoacoustic emitter”, 2021 [link](https://medicalxpress.com/news/2021-07-non-genetic-photoacoustic-neurons-tapered-fiber.html)
9. *Science Trends*,“Graphene Improves the Efficiency of Semiconductor Solar Water Splitting”, 2018 [link](https://sciencetrends.com/graphene-improves-the-efficiency-of-semiconductor-solar-water-splitting/)
10. *Advances in Engineering,* “High-speed spectroscopic transient absorption imaging of nanoscale defects in graphene”, 2018 [link](https://advanceseng.com/high-speed-spectroscopic-transient-absorption-imaging-nanoscale-defects-graphene/)

**Before BU**

1. *C&EN*,“Silicon Nanowires Light Up for Imaging”, 2009 [link](https://cen.acs.org/articles/87/i20/Silicon-Nanowires-Light-Imaging.html)
2. *Harvard Gazette*,“Making the world’s smallest gadgets even smaller”, 2005 [link](https://news.harvard.edu/gazette/story/2005/12/making-the-worlds-smallest-gadgets-even-smaller-2/)

**PLENARY PRESENTATIONS**

1. “Non-genetic Photoacoustic Neural Stimulation”, BIOS Hot Topics Session, Photonics West, SPIE, San Francisco, Jan 28, 2023
2. “Non-genetic Photoacoustic Neural Stimulation”, Frontier in Neurophotonics Symposium, Québec City, Canada, Oct 10, 2022

**INVITED PRESENTATIONS**

1. Summer School Frontiers in Neurophotonics, Canadian Neurophotonics Center, Quebec, May 28, 2024
2. “Implantable Photoacoustic and Microwave Neural Interface”, Symposium on Advanced Biomaterials and Bioelectronics for Neural Interfacing, MRS Spring 2024, Seattle, Apr 24, 2024
3. “Non-genetic High precision Photoacoustic Neural stimulation”, Frontiers and Challenges in Laser-Based Biological Microscopy 2023, Telluride, July 24, 2023
4. “Photoacoustic Neural Stimulation”, Ultrasound 2023, Lisbon, June 26, 2023, Keynote presentation
5. “Photoacoustic Interface for High Precision Neural Stimulation”, Symposium on Emerging Nanotechnologies, MRS Spring Meeting, San Francisco, Apr 12, 2023
6. “**Advances in non-genetic photoacoustic neuromodulation: Mechanism and close-looped capability**,” Photonics West, SPIE, San Francisco, Jan 29, 2023
7. “High Precision Photoacoustic Neural Stimulation”, International Symposium on Biomolecular Ultrasound & Sonogenetics, Pasadena, Dec 10, 2022
8. “High Precision Photoacoustic Neural Stimulation”, WACBE-AIMBE Fellow Webinar, Dec 2, 2022
9. “Photoacoustic Neural Stimulation”, Simmons University, Boston, Oct 24, 2022
10. “Non-genetic High Precision Neuromodulation”, U.S. Food and Drug Administration, Division of Biomedical Physics, June 8, 2022
11. “High Precision Photoacoustic Neural Stimulation”, Photonics North, Session “Biophotonics, Novel Sensing, and Advanced Imaging”, May 26, 2022
12. “Bioelectronics and Photonics Interfaces for Non-genetic High Precision Neuromodulation”, ARO bioelectronics workshop, May 22, 2022, Austin TX.
13. “Non-genetic High Precision Neuromodulation”, Department of Chemistry, Purdue University, Apr 16, 2022
14. “High Precision Photoacoustic Neural Stimulation”, SPIE Photonics West, Conference “Optogenetics and Optical Manipulation”, March, 2022
15. “Photoacoustic Neural Stimulation”, V-Mat2021, 3rd Edition of Materials Science and Nanoscience Webinar, Sep 18, 2021
16. “Photoacoustic stimulation with single neuron precision”, Optogenetics and Optical Manipulation 2021 SPIE Photonics West, 2021.
17. “Design Nanophotonics Interface for Photoacoustic Brain Stimulation”, 2019 MRS Fall meeting, Boston, Dec 3, 2019
18. “Design Nanomaterial Interface to Fire and Connect Neurons”, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou, China, Oct 24, 2019
19. “Design Optoacoustic Nanomaterial Interface to Fire and Reconnect Neurons”, Zhejiang University, School of Optical Science and Engineering, Hangzhou, China, Oct 23, 2019
20. “Design Optoacoustic Nanomaterial Interface to Fire Neurons”, 2019 SPIE Photonics Asia, Hangzhou, China, Oct 22, 2019
21. “Design Optoacoustic Nanomaterial Interface to Fire and Reconnect Neurons”, 8th International Conference on Nanoscience and Technology, Beijing, China, August 17, 2019
22. “Design Optoacoustic Nanomaterial Interface to Fire and Reconnect Neurons”, 14th Sino-US Forum on Nanoscale Science and Technology, Changsha, China, June 22, 2019
23. “Photonic Nanomaterial for Lighting, Solar Energy Harvesting and Neurostimulation”, Analog Devices, Boston, May 15, 2019
24. “Photonics Nanomaterials for Lighting, Solar Energy and Neurostimulation”, Photonics Forum, Photonics Center, Boston University, Nov 28, 2018
25. “Discover and Design Functional Nanomaterials for Biomedical Applications”, BUnano Annual Symposium, Boston University, Nov 26, 2018
26. “Design Nanomaterial to Reconnect and Fire Neurons”, Department of Biomedical Engineering, Tufts University, Nov 19, 2018
27. “Design Nanomaterial for Neuron Regeneration and Stimulation”, MSE Symposium, Boston University, Nov 2, 2018
28. “Design Nanomaterial to Reconnect and Fire Neurons”, Department of Chemistry and Biochemistry, University of Massachusetts Dartmouth, Sep 26, 2018
29. “Plasmonic nanowire and graphene for Energy Application”, 256th ACS National Meeting, Boston, August 23, 2018
30. “Highly Sensitive and High-speed Imaging of Grain Boundaries in Graphene by Transient Absorption Microscopy” 256th ACS National Meeting, Boston, August 23, 2018
31. “Discover and Design Photonic Nanomaterials for Biomedical Application”, Department of Chemistry, TsingHua University, China, May 30, 2018
32. “Nanoladders for Directional Axonal Outgrowth and Functional Regeneration”, 18th International Conference and Exhibition on Materials Science and Engineering, Osaka, May 28, 2018
33. “Discover and Design Photonic Nanomaterials for Biomedical Application”, School of Biological science and medical engineering, Beihang University, China, May 25, 2018
34. “Improving Photocatalyst Performance Using Nanomaterials”, 255th ACS National Meeting, New Orleans, March 20, 2018
35. “Functional Nanomaterials for Photonics and Biomedical Applications”, Department of Chemical Engineering, University of Massachusetts, Lowell, Oct 19, 2017
36. “Functional Nanomaterials for Photonics and Biomedical Applications”, Department of Chemistry, Boston College, Oct 5, 2017
37. “Highly sensitive and high-speed imaging of grain boundaries in graphene by transient absorption microscopy”, SPIE Low-Dimensional Materials and Devices 2017, San Diego, August 9, 2017.

**Before BU**

1. “Highly sensitive and high-speed imaging of grain boundaries in graphene by transient absorption microscopy”, 2nd Telluride Workshop on the Defect Chemistry and Physics of Low-Dimensional Materials, July 11, 2017, Telluride.
2. “Graphene as a Bioprotection Film”, International Conference in Nanomedicine and Nanotechnology, Baltimore, October 12, 2016
3. “Functional Nanomaterials for Photonics and Biomedical Applications”, Department of Chemistry, Boston University, July 23, 2016
4. “Functional Nanomaterials for Electronics, Photonics and Biomedical Applications”, Department of Electrical and Computer Engineering, Boston University, April 11, 2016
5. “Plasmonic Nanowires for Solar Energy Applications”, American Chemical Society Annual Meeting, March 22, 2015
6. “Plasmonic Nanowire Structures for Energy and Photonics Applications”, Department of Physics, Boston College, November 15, 2014
7. “Functional Nanomaterial for Electronic and Energy Applications”, Department of Electrical and Computer Engineering, University of Illinois at University of Illinois at Urbana Champaign, October 9, 2014
8. “Plasmonic Nanowire Structures for Energy and Photonics Applications”, Department of Physics, Notre Dame University, September 25, 2014
9. “Plasmonics for Enhancing Internal Quantum Efficiency of Core-Shell and Core-Multishell Nanowire Photoelectrodes”, Department of Chemistry, University of California, Santa Cruz, August 14, 2014
10. “Functional Silicon Nanowires: a 1D Nano-bio Model System for Drug Delivery”, American Chemical Society Annual Meeting, August 13, 2014
11. “Functional Nanomaterials for Photonics and Biomedical Applications”, Department of Physics, Indiana University, Bloomington, Apr 11, 2014.
12. “Functional Nanomaterials for Electronic and Biomedical Applications”, University of Science and Technology of China, National Laboratory for Physical Sciences at the Microscale, Oct 16, 2013.
13. “Transport Modulation in Ge/Si Core/Shell Nanowires through Controlled Synthesis of Doped Si Shells”,Centre Européen de Calcul Atomique et Moléculaire workshop “Theory, Simulation and Modelling of SiGe Nanostructures: from Nanoelectronics to Renewable Energy”, Lausanne, Switzerland, June 2, 2013
14. “Understanding On-Off Current Ratio and the Impact of Schottky Barriers Towards Design of III-V Nanowire Field Effect Transistors”, 2013 Energy, Materials, Nanotechnology Spring Meeting, Orlando, April 8, 2013
15. “Functional Nanomaterial for Nanoelectronics and Biomedical Applications”, National Institute of Standards and Technology, Maryland, January 24, 2013
16. “Functional Nanomaterial for Nanoelectronics and Biomedical Applications”, University of Maryland, Department of Chemistry, January 23, 2013
17. “Study of cellar response to functional silicon nanowires using non linear optical imaging”, 2nd International Conference on Nanotek and Expo, Philadelphia, December 4, 2012.
18. “Chemically Synthesized Nanomaterials for Nanoelectronics and Biomedical Applications”, Rice University, Department of Chemistry, September 12, 2012.
19. “Chemically Synthesized Nanomaterials for Biomedical Applications”, US-China Workshop on Advanced Nanostructured Materials, Changchun, China, August 24, 2012
20. “Chemically Synthesized Nanomaterials for Nanoelectronics and Biomedical Applications”, Notre Dame University, Department of Chemistry, April 26, 2012.
21. “Functional Nanowires for Nanoelectronics and Nanobiotechnology”, Indiana University, Bloomington, Department of Chemistry, March 20, 2012.
22. “Chemically Synthesized Nanomaterials for Biomedical Applications”, Iowa State University, Department of Chemistry, March 2, 2012
23. “Functional Nanowires for Nanoelectronics and Nanobiotechnology”, University of California, San Diego, Department of Electrical and Computer Engineering, February 17, 2012
24. “Nanowires for Nanoelectronics and Nanobiotechnology Applications”, University of Michigan, Department of Physics, October 4, 2011
25. “Functional Nanowires and Nanowire Heterostructures for Nanobiotechnology”, 6th US-Sino Nano Forum, Changchun, China, July 2, 2011
26. “Optical Properties of Si/Au Core-Shell nanowires”, Fluorescent and Plasmonic Probes in Chemical Systems, 42nd ACS Central Regional Meeting in Indianapolis, June 8, 2011
27. “In vitro and In vivo Imaging of Silicon Nanowires”, Purdue Physics Department, November, 2009, West Lafayette, IN, US.
28. “ Nanowires from nanoelectronics to nano-bio interface”, National Center for Nanoscience and Technology, January 6, 2009, China
29. “ Nanowires from nanoelectronics to nano-bio interface”, TsingHua University, Department of Chemistry, January 7, 2009, China
30. “In vitro and In vivo Imaging of Silicon Nanowires”, US-India Workshop on Frontiers in Scalable Nanostructured Materials and Interfaces, March 10, 2009, West Lafayette, IN, US.
31. “Modulation-doped Nanowires: Synthesis, Characterization and Applications”, Purdue Chemistry Department Physical Chemistry seminar, September 5, 2007
32. **“**Semiconductor nanowires for nanoelectronics and nanophotonics”, Purdue Physics Department Condense Matter Physics seminar, October 21, 2007
33. “Encoding Information by Synthesis in Axial Modulation-doped Nanowires”, American Vacuum Society National Meeting 2005

**SCHOLOAR AND PROFESSIONAL ACTIVITES**

**Editorial Leadership**

1. Guest editor of *Frontier in Cellular Neuroscience* (2023, 2024)
2. Topical Advisory Panel of *Materials* (since 2020)
3. Editorial Board of*Nanomedicine & Nanoscience Achieves* (since 2020)
4. Guest editor of *Molecules*, *Special issue in Nanoscale Wires: Synthesis, Characterization, and Applications* (2018)
5. Guest editor of *Journal of Electronic Materials*, *Special issue for 2011 Electronic Material Conference* (2012)

**Conference organization**

1. Member of program committee for Neural Imaging and Sensing 2024, SPIE Photonic West.
2. Discussion Leader, GRC, Silk Proteins and the Transition to Biotechnologies, 2023
3. Chaired MRS 2023 Spring meeting, Symposium “Emerging Nanotechnologies for Cellular Interrogation and Manipulation”, 2023.
4. Organized and chaired BU-Zhejiang U-Zhejiang Lab Photonics Mini Symposium, 2022
5. Organized and chaired “Nanophotonics and Micro/Nano Optics V”, Photonics Asia, 2019
6. Organized and chaired ‘Nanowire and Nanotube’ session for Energy, Material and Nanotechnology 2013.
7. Organized and chaired “Nano-Probes for Biological Systems” symposium in 248th American Chemistry Society Meeting, 2014.
8. Served on Electronic Materials Conference committee, and organized ‘Nanowire and nanotube’ session in Electronic Material Conference, 2010
9. Served on Electronic Materials Conference committee, and organized ‘Nanowire and nanotube’ session in Electronic Material Conference, 2011

**Journal review**

I served as a reviewer for the following journals *Nano Letters*, *Advanced Materials*, *Applied Physics Letter*, *ACS Nano, ACS Applied Material and Interface, Nature Communication, Nanoscale, Nano Research, Journal of Physical Chemistry, Applied Spectroscopy, Journal of Electronic Materials, Photoacoustic, Science Advances.*

**External Grant Review**

1. ad hoc: ACS PRF Fund (2008), NSF CHE (2008, 2012), ARO (2020), Innovation and Technology Commission of Hong Kong (2023)
2. Panel review NSF DMR (2011, 2013, 2014, 2015).

**Public Service**

1. Panelist on National Photonics Initiative Congressional Visit Day, 2021
2. Panelist on Boston Postdoctoral Association (BPDA) Panel Discussion, 2021
3. Panelist on International Symposium on Biomolecular Ultrasound and Sonogenetics Career Panel Discussion, 2022
4. Judge for S. T. Yau High School Science Award Competition, 2023

**Leadership and Service at BU**

**University and College Level**

1. University Laboratory Safety Committee, 2019-2020
2. College of Engineering Master program task force, 2022
3. College of Art and Science Lecture Promotion Committee, 2019-2020, 2021

**Department Level**

1. Department of ECE MS Associate Chair for ECE Master program, 2020-present
2. Department of ECE Master program Committee member, 2020-present
3. Department of ECE Publicity Committee member, 2019-2020
4. Department of ECE Ph.D. program Committee member, 2017-2020
5. Department of ECE Initiated and Led an International Research Experience for Undergraduates partnering with Zhejiang University, 2018, 2019
6. Department of Chemistry Graduate Program Committee member, 2019-2020
7. Department of Chemistry Instrumentation Committee member, 2018

**MENTORING AND ADVISING**

**Current Ph.D. Students advised at BU (Total 5)**

Guo Chen 2020 Ph.D. ECE

Zhiyi Du 2020 Ph.D. Chemistry

**Ph.D. Students graduated from BU**

|  |  |  |  |
| --- | --- | --- | --- |
| Student Name | Degree received | Thesis title | Current Position |
| Katherine Hansen | Ph.D. in Chemistry, 2020 | Synthesis and Design of Alternative Plasmonic Materialsfor Core-Multishell Nanowire Photonic Devices | Scientist, CapeSym |
| Yimin Huang | Ph.D. in Chemistry,  2020 | Functional Nano-Bio Interfaces For Cell Modulation | Process Scientist, Applied Materials |
| Amartya Dutta | Ph.D. in ECE, 2021 | Plasmonic Core-Multi-Shell Nanomaterials For ImprovingEnergy Efficiency And Sensing | Process Development Engineer, Intel |
| Linli Shi | Ph.D in Chemistry, 2022 | Optoacoustic Cell Modulation at Micron-Scale Precision | Postdoctoral fellow, Center for Devices and Radiological Health, FDA |
| Nan Zheng | Ph.D. in MSE, 2023 | Multifunctional Photoacoustic MaterialsFor Neural Engineering | Process Scientist, Applied Materials |
| Ran Cheng | Ph.D. in Chemistry | Developing High-Speed Surface-Enhanced Raman Bioimaging Platforms | Scientist, Merck |

**Ph.D. Students graduated from Purdue**

|  |  |  |  |
| --- | --- | --- | --- |
| Student Name | Degree received | Thesis title | Current Position |
| Yanjie Zhao | Ph.D. in Physics 2012 | Ge/Si Heterostructure nanowires and group III-V nnaowires for low-power high-performance nanoelectronics | Principal Investigator, China Electronic Technology Group Corporation |
| Sung Hwan Chung | Ph.D. in ECE 2013 | Orientation controllable epitaxial vapor-liquid-solid semiconductor nanowire synthesis on silicon substrate | Process Engineer, Intel |
| Yunlong Zi | Ph.D. in Physics 2014 | Control and understanding growth of III-V nanowire structures | Associate Professor at Hong Kong University of Science and Technology - Guangzhou |
| Weixia Zhang | Ph.D. in Chemistry 2014 | Chemical synthesized nanostructures interfacing with biology | Director for Drug Discovery, WuXi AppTec HitS Department |
| Sarath Ramadurgam | Ph.D. in Physics 2016 | Tailoring optical and plasmon resonances in core-shell and  Core-multishell nanowires | Product Engineer, LAM Research Corporation |
| Tzu-ging Lin | Ph.D. in Physics 2016 | Fabrication and photonics properties of III-V semiconductor nanowire structures | Principal Engineer, Taiwan Semiconductor Manufacturing Company |
| Jeremy McCall | Ph.D. in Chemistry 2017 | Detecting and utilizing lattice defects in graphene | Engineer, SRI |
| Kelly McNear | Ph.D. in Chemistry 2017 | Understanding interactions of nanomaterials with biological environment | Postdoc, University of Colorado |
| Melissa Cardona | Ph.D. in Chemistry 2019 | Designing and Understanding Hematite BasedNanomaterials for Soalr Energy Applications | Scientist, Masimo Semiconductor |

**Master student advised at BU as MS Thesis or MS Project advisor**

Vikrant Sharma (MSE) 2023-, Thesis: Controlling cardiomyocytes with PA stimulation

Jinzhi Shen (ECE) 2023-, Project: 3D Scan Process Optimization for Photoacoustic Imaging

Mark Cherepashensky (BME) 2022-2023, Thesis: Nerve Blocking Effect of Microwave Slit Rings

Gavin Rosen (MSE) 2020-2021, Thesis: Axon Guidance by Targeted Photoacoustic Stimulation

Brian Pihuleac (MSE) 2019-2020, Thesis: Core-Multishell Nanoparticles for The Plasmonic Enhancement of Hematite (α-Fe2O3) For Photoelectrochemical Water Splitting plasmonic nanoparticles based photoelectrochemical cells

Maijie Xiang (MSE) 2021-2023, Thesis: CNT/PDMS Films: High Photoacoustic Efficiency And Tunable Frequency In Sub-Mhz.

Heyu Huang (BME) 2019-2020, Project: Silk-Based Multifunctional Scaffolds for Spinal Cord Tissue Stimulation and Reconnection

Fanchen Luo (MSE) 2019-2020, Project: Developing a Cladding Layer for Tapered Fiber-Based Optoacoustic Emitter frequency controlled optoacoustic converters.

Yuzhou Li (MSE) 2022-, Project: Laser Carbonization of PDMS as a New Method Fabricating Photoacoustic Devices.

**Undergraduate Researcher advised at BU**

Elizabeth Ozimek (BMB) 2022-2023, BU

Vikrant Sharma (ECE) 2022-2023, BU, Senior Design

Brendan Shortall (ECE) 2022-2023, BU

Albert Youssef (BMB) 2021-, BU

Maia Minto (BMB) 2021-, BU

Raheem Carless 2019, Roxbury Community College (underrepresented minority)

Olivia Zhou (Chemistry) 2019, BU

Jinyan Si 2019, University of Science and Technology of China

Zhiyi Du 2019, University of Science and Technology of China

Yang Liu 2019, Zhejiang U

Guo Chen 2019, Zhejiang U

Gabrielle Abad (ECE) 2018, BU

Shihan Zhu 2018, University of Science and Technology of China

Ran Cheng 2018, University of Science and Technology of China

Yiming Fu 2018, Zhejiang University

Yifei Geng 2018, Zhejiang University

Sulaiman Abdul-Hadi 2018-2019, Roxbury Community College (underrepresented minority)

Natalie Dong (BME) 2017, BU, Senior Design

Matthew Connor (BME) 2017, BU, Senior Design