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Professional Preparation

1999–2003	B.S.	Electrical Engineering, Fudan University, Shanghai, China
2003–2006	M.S.	Physics, Fudan University, Shanghai, China
2006–2012	Ph.D.	Applied Physics, Rice University, Houston, TX
2011–2017	Postdoc	Chem. & Chem. Biol., Harvard University, Cambridge, MA

Appointments

2017–present	<i>Assistant Professor</i> , Department of Electrical and Computer Engineering; Institute for Applied Life Sciences; Department of Biomedical Engineering (Adjunct), University of Massachusetts, Amherst
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Honors

Barbara H. & Joseph J. Goldstein Outstanding Junior Faculty Award, COE, UMass (20-21)
Sony Innovative Faculty Award, Sony Corporation (2021)
Armstrong Fund for Science Award, UMass Amherst (2020)
Manning/IALS Innovation Award, UMass Amherst (2019)
NSF CAREER Award, National Science Foundation (2019)
Technology Development Award by President Office, UMass Amherst (2018)
Top Prize, Innovation Challenge, UMass Amherst (2018)
Nano Venture Forum Prize, Rice University (2011)
23th Quantum Institute Colloquium Award, Rice University (2009)

Publications (“#” corresponding author)

43. Tianda Fu, Xiaomeng Liu, Shuai Fu, Trevor Woodard, Hongyan Gao, Derek R. Lovley, **Jun Yao**[#], “Self-sustained Green Neuromorphic Interfaces”, *Nature Commun.* **12**, 3351 (2021).
42. Derek R. Lovley, **Jun Yao**, (Review) “Intrinsically Conductive Microbial Nanowires for ‘Green’ Electronics with Novel Functions”, *Trends Biotechnol.* online (2021).
41. Xiaomeng Liu, Tianda Fu, Joy Ward, Hongyan Gao, Bing Yin, Trevor Woodard, Derek R. Lovley, **Jun Yao**[#], “Multifunctional Protein-Nanowire Humidity Sensors for Green Wearable Electronics”, *Adv. Electron. Mater.* **6**, 2000721 (2020).

40. Jian Sun, Russell S. Deacon, Xiaochi Liu, **Jun Yao**, Koji Ishibashi, “Spin Filtering in Germanium/Silicon Core/Shell Nanowires with Pseudo-helical Gap”, *Appl. Phys. Lett.* **117**, 052403 (2020).
39. Alexander Smith, Xiaomeng Liu, Trevor Woodward, Todd Emrick, Juan Jimenez, Derek R. Lovley#, **Jun Yao**#, “Bioelectronic Protein Nanowire Sensors for Ammonia Detection”, *Nano Research* **13**, 1479–1484 (2020).
38. Xiaomeng Liu, Hongyan Gao, Joy Ward, Xiaorong Liu, Bing Yin, Tianda Fu, Jianhan Chen, Derek R. Lovley, **Jun Yao**#, “Power Generation from Ambient Humidity Using Protein Nanowires”, *Nature* **578**, 550-554 (2020).
37. Tianda Fu, Xiaomeng Liu, Hongyan Gao, Joy Ward, Xiaorong Liu, Bing Yin, Zhongrui Wang, Ye Zhuo, David Walker, J. Joshua Yang, Jianhan Chen, Derek R. Lovley, **Jun Yao**#, “Bioinspired Bio-Voltage Memristors”, *Nature Commun.* **11**, 1861 (2020).
36. Masiar Sistani, Jovian Delaforce, Roman B. G. Kramer, Nicolas Roch, Minh Anh Luong, Martien I. den Hertog, Eric Robin, Jürgen Smoliner, **Jun Yao**, Charles M. Lieber, Cecile Naud, Alois Lugstein, Olivier Buisson, “Highly Transparent Contacts to the 1D Hole Gas in Ultrascaled Ge/Si Core/Shell Nanowires”, *ACS Nano* **13**, 14145-14151 (2019).
35. Hongyan Gao, Bing Yin, Siyu Wu, Xiaomeng Liu, Tianda Fu, Cheng Zhang, Jian Lin, **Jun Yao**#, “Deterministic Assembly of Three-Dimensional Suspended Nanowire Structures”, *Nano Lett.* **19**, 5647-5652 (2019).
34. Rui Wang, Russell S. Deacon, Jian Sun, **Jun Yao**, Charles M. Lieber, Koji Ishibashi, “Gate Tunable Hole Charge Qubit Formed in a Ge/Si Nanowire Double Quantum Dot Coupled to Microwave Photons”, *Nano Lett.* **19**, 1052-1060 (2019).
33. M. Sistani, M. A. Luong, M. I. den Hertog, E. Robin, M. Spies, B. Fernandez, **Jun Yao**, E. Bertagnolli, A. Lugstein, “Monolithic Axial and Radial Metal-Semiconductor Nanowire Heterostructures”, *Nano Lett.* **18**, 7692-7697 (2018).
32. Bing Yin, Xiaomeng Liu, Hongyan Gao, Tianda Fu, **Jun Yao**#, “Bioinspired and Bristled Microparticles for Ultrasensitive Pressure and Strain Sensors”, *Nature Commun.* **9**, 5161 (2018).
31. Jian Sun, Russell S. Deacon, Rui Wang, **Jun Yao**, Charles M. Lieber, Koji Ishibashi, “Helical Hole State in Multiple Conduction Modes in Ge/Si Core/Shell Nanowire”, *Nano Lett.* **18**, 6144–6149 (2018).

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30. Thomas Schuhmann*, **Jun Yao***, Guosong Hong, Tianming Fu and Charles M. Lieber, “Syringe-injectable electronics with a plug-and-play input/output interface,” *Nano Lett.* **17**, 5836–5842 (2017). (* equal contributors)

28. Yunlong Zhao*, **Jun Yao***, Lin Xu, Max Mankin, Yinbo Zhu, Heng-An Wu, Liqiang Mai, Qingjie Zhang, Charles M. Lieber, "Shape-controlled deterministic assembly of nanowire", *Nano Lett.* 16, 2644-2650 (2016) (*equal contributors).
29. **Jun Yao**, Hao Yan, Shamik Das, James Klemic, James Ellenbogen, and Charles M. Lieber, "Nanowire nanocomputer as a finite-state machine", *Proc. Natl. Acad. Sci. USA* 111, 1259-1264 (2014).
27. Wooyoung Shim*, **Jun Yao***, and Charles M. Lieber, "Programmable resistive-switch nanowire transistor logic circuits", *Nano Lett.* 14, 5430-5436 (2014) (*equal contributors).
26. Andrew P. Higginbotham, F. Kuemmeth, T. W. Larsen, **Jun Yao**, Hao Yan, Charles M. Lieber, and Charles M. Marcus, "Antilocalization of coulomb blockage in a Ge/Si nanowire", *Phys. Rev. Lett.* 112, 216806 (2014).
25. Andrew P. Higginbotham, T. W. Larsen, **Jun Yao**, Hao Yan, Charles M. Lieber, and Charles M. Marcus, "Hole spin coherence in a Ge/Si heterostructure nanowire", *Nano Lett.* 14, 3582-3586 (2014).
24. **Jun Yao**, Hao Yan, and Charles M. Lieber, "A nanoscale combing technique for the large-scale assembly of highly aligned nanowires", *Nature Nanotechnol.* 8, 329-335 (2013).
23. **Jun Yao***, Jian Lin*, Yanhua Dai, Gedeng Ruan, Zheng Yan, Lei Li, Zhong Lin, Douglas Natelson, and James M. Tour, "Highly transparent nonvolatile resistive memory devices from silicon oxide and graphene", *Nature Commun.* 3, 1101 (2012) (*equal contributors).
22. Lei Ren, Qi Zhang, **Jun Yao**, Zhengzong Sun, Ryosuke Kaneko, Zheng Yan, Sebastien Nanot, Zhong Jin, Iwao Kawayama, Masayoshi Tonouchi, James M. Tour, and Junichiro Kono, "Terahertz and infrared spectroscopy of gated large-area graphene", *Nano Lett.* 12, 3711-3715 (2012).
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19. Zhengzong Sun, Cary L. Pint, Daniela C. Marcano, Chenguang Zhang, **Jun Yao**, Gedeng Ruan, Zheng Yan, Yu Zhu, Robert H. Hauge, and James M. Tour, "Toward hybrid superlattices in graphene", *Nature Commun.* 2, 559 (2011).
18. Zheng Yan, Zhiwei Peng, Zhengzong Sun, **Jun Yao**, Yu Zhu, Zheng Liu, Pulickel M. Ajayan, and James M. Tour, "Growth of bilayer graphene on insulating substrates", *ACS Nano* 5, 8187-8192 (2011) .
17. **Jun Yao**, Lin Zhong, Douglas Natelson, and James M. Tour, "Silicon oxide: a non-innocent surface for molecular electronics and nanoelectronics", *J. Am. Chem. Soc.* 133, 941-948, 2011.

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10. **Jun Yao**, Zhengzong Sun, Lin Zhong, Douglas Natelson, and James M. Tour, "Resistive switches from silicon oxide", *Nano Lett.* 10, 4105-4110, 2010.
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7. **Jun Yao**, Zhong Jin, Lin Zhong, Douglas Natelson, and James M. Tour, "Two-terminal nonvolatile memories from single-walled carbon nanotubes", *ACS Nano* 12, 4122-4126, 2009.
6. **Jun Yao**, Lin Zhong, Zengxing Zhang, Tao He, Patrick J. Wheeler, Douglas Natelson, and James M. Tour, "Resistive switching in nanogap systems on SiO₂ substrates", *Small* 24, 2910-2915, 2009.
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3. Tao He, Meng Lu, **Jun Yao**, and James M. Tour, "Reversible modulation of conductance in silicon device via UV/Visible-light irradiation", *Adv. Mater.* 20, 4541-4546, 2008.

2. **Jun Yao** and Zhongqin Yang, “Spin accumulation in a ballistic Rashba bar”, *Phys. Rev. B* 73, 033314, 2006.
1. **Jun Yao**, Yu-Chang Chen, Massimiliano Di Ventra, and Zhongqin Yang, “Effect of atomic geometry on shot noise in aluminum quantum point contacts”, *Phys. Rev. B* 73, 233407, 2006.

Patents

- 10 **Jun Yao**, Derek R. Lovley, Xiaomeng Liu, “Electric power generation from ambient humidity using protein nanowires”, provisional application **62,738,320** filed Sep. 28, 2018, and **62,835,023** filed Apr 17, 2019.
- 9 **Jun Yao**, Derek R. Lovley, Tianda Fu, “Memristor device comprising protein nanowires”, provisional application **63,007,136**, filed Apr. 8, 2020.
- 8 **Jun Yao**, Derek R. Lovley, Alexander Smith, Xiaomeng Liu, “Sensors comprising electrically-conductive protein nanowires”, provisional application **63,014,043**, filed Apr. 22, 2020.

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- 7 Charles M. Lieber, Thomas G. Schuhmann, **Jun Yao**, Guosong Hong, Tian-ming Fu, Jungmin Lee, Hong-Gyu Park “Interfaces for syringe-injectable electronics”, US Patent application **15,977,710**, filed May 11, 2018.
- 6 James M. Tour, **Jun Yao**, Jian Lin, Gunuk Wang, Krishna Palem, “Addressable SiO_x memory array with incorporated diodes”, US Patent **9,385,163**, issued Jul. 5, 2016.
- 5 James M. Tour, **Jun Yao**, Douglas Natelson, Lin Zhong, Tao He, “Electronic devices containing switchable conductive silicon oxide as a switching element and methods for production and use thereof”, US Patent **9,129,676**, issued Sep. 8, 2015.
- 4 James M. Tour, Yubao Li, Alexander Sinitskii, Lin Zhong, Mian Dong, **Jun Yao**, “Vertically-stacked electronic devices having conductive carbon films”, US Patent **8,395,901**, issued Mar. 12, 2013.
- 3 Zvi Or-Bach, James M. Tour, **Jun Yao**, Brian Cronquist, “Method for fabrication of a semiconductor element and structure thereof”, US Patent **7,973,559**, issued Jul. 5, 2011
- 2 James M. Tour, **Jun Yao**, “Invisible/transparent nonvolatile memory”, US Patent Application **13/985,956**, filed Feb. 16, 2012.
- 1 James M. Tour, **Jun Yao**, Burt Fowler, Glenn Mortland, “SiO_x-based nonvolatile memory architecture”, US Patent Application **13/821,632**, filed Sep. 8, 2011.