

# Jinyao Tang

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## Academic Qualification

### University of California, Berkeley

Berkeley, CA

Postdoctoral Fellow

10/2008-10/2012

Department of Chemistry

Advisor: Prof. Peidong Yang

### Columbia University, Graduate School of Arts and Sciences

New York, NY

Ph.D. in Chemistry

08/2008

Department of Chemistry

Thesis Title: *Encoding Molecular-Wire Formation within Nanoscale Sockets and Mass Transport in Single Wall Carbon Nanotube*

Advisor: Prof. Colin Nuckolls

### University of Science and Technology of China

Anhui, China

B.S. in Chemical Physics

07/2003

Department of Chemical Physics

Advisor: Prof. Jianguo Hou

## PROFESSIONAL AND RESEARCH EXPERIENCE

### The University of Hong Kong

Hong Kong Island, Hong Kong

Assistant Professor in Department of Chemistry

10/2012-present

### Lawrence Berkeley National Laboratory

Berkeley, CA

Postdoctoral Research Scientist

07/2008 - 10/2012

- Develop silicon based nanostructure as high efficient thermoelectric material for energy conversion
- Develop nanowire based high efficiency solar cells
- Develop nanowire based high efficiency photoelectrochemical cells for solar fuels

### Columbia University

New York, NY

Graduate Research Assistant

01/2004 - 07/2008

- Invented a novel process to fabricate molecular scale nanogaps for molecular electronics application
- Developed a two-step modular assemble method to bridge nanogaps with organic molecules
- Studied the electric properties of organic nanostructures, including nanoribbons and nanowires
- Explored the methodology of detecting and sensing the solution flow through individual single walled carbon nanotube and developed its applications in DNA sequencing

### University of Science and Technology of China

Anhui, China

Undergraduate Research Assistant

10/2007 - 06/2008

## TECHNICAL SKILLS

Specialize in complex nano-micro device fabrication and system integrating.

Electric and thermal characterization and imaging of nano-devices and solar cells.

## SELECTED CONFERENCES

1. EIPBN 2006

**Poster (Student Awards):** “Chemically Responsive Molecular Transistors Fabricated by Self-Aligned Lithography and Chemical Self-Assembly”

2. APS March 2006

**Presentation:** “Self-aligned lithography and in-situ assembly of chemically responsive single-molecule transistors”

3. ACS March 2010

**Presentation:** “Holey Silicon film as efficient thermoelectric material”

4. Cleantech 2012

**Invited Presentation:** “Solution processed nanowire for solar energy conversion”

5. International Workshop on Materials Science and Materials Chemistry for Energy at Peking University 2012

**Invited Presentation:** “Nanoscience for Sustainable Energy”

6. THE 19TH ANNUAL CONFERENCE OF THE PHYSICAL SOCIETY OF HONG KONG (2016)

**Invited Presentation:** “Sub-bandgap excitation of quantum dots sensitized graphene photodetector”

7. Materials Challenges in Alternative and Renewable Energy 2017 (MCARE 2017)

**Invited Presentation:** “Nanoengineering for Thermoelectric material”

8. 2017 International Conference on Micro/Nanomachines (ICMNM 2017)

**Invited Presentation:** “Exploring Light Propelled Nano/Microswimmer”

9. The 10th international Conference on Advanced Materials and Devices (ICAMD 2017)

**Invited Presentation:** “Light powered microswimmer-towards more controllable nanorobot.”

## SELECTED PUBLICATIONS

1. Z. Xiong, Y. Cai, X. Ren, B. Cao, J. Liu, Z. Huo, J. Tang, Solution-Processed CdS/Cu<sub>2</sub>S Superlattice Nanowire with Enhanced Thermoelectric Property. **ACS Applied Materials & Interfaces**, Accepted (2017)
2. Z. Xiong, J. Chen, J. Wang, Y. Cai, X. Liu, Z. Su, S.J. Xu, A. Khan, W. Li, J. Bian, G. Li, M. Huang, J. Tang. Electrochemical Half-Reaction Assisted Graphene Hybrid Phototransistor. **NPG Asia Mater**, Accepted (2017)
3. J. Wang, Z. Xiong, X. Zhan, B. Dai, J. Zheng, J. Liu, and J. Tang, Silicon Nanowire as Spectral Tunable Light-Driven Nanomotor. **Adv. Mater.** 29 (30), 1701451 (2017)
4. B. Dai, J. Wang, Z. Xiong, X. Zhan, W. Dai, C. Li, S. Feng, and J. Tang, Programmable artificial phototactic microswimmer. **Nat. Nanotechnol.** 11, 1087–1092 (2016)
5. Y. Su, C. Liu, S. Brittan, J. Tang, A. Fu, N. Kornienko, Q. Kong, P. Yang, Single-Nanowire Photoelectrochemistry. **Nat. Nanotechnol.** 11, 609-612, (2016)
6. A. Khan, S. Lee, T. Jang, Z. Xiong, C. Zhang, J. Tang, L. J. Guo, W.-D. Li, High-Performance Flexible Transparent Electrode with an Embedded Metal Mesh Fabricated by Cost-Effective Solution Process. **Small**, 12: 3021–3030. (2016)
7. J. Lim, H. Wang, J. Tang, S. C. Andrews, J. Lee, D. Lee, T. P. Russell, P. Yang, Simultaneous Thermoelectric Property Measurement and Incoherent Phonon Transport in Holey Silicon. **ACS Nano**, 10 (1), 124-132, (2016)
8. X. Liu, Q. Sun, A. M. C. Ng, A. B. Djuricic, M. Xie, B. Dai, J. Tang, C. Surya, C. Liao, K. Shih, An alumina stabilized graphene oxide wrapped SnO<sub>2</sub> hollow sphere LIB anode with improved lithium storage. **RSC Advances** 5, 100783 (2015).
9. C. Liu, J. Tang, H. Chen, B. Liu, P. Yang, A Fully Integrated Nanosystem of Semiconductor Nanowires for Direct Solar Water Splitting, **Nano Lett.**, 13 (6), 2989-2992.(2013)
10. Liu, C., Sun, J., Tang, J. & Yang, P. Zn-Doped p-Type Gallium Phosphide Nanowire Photocathodes from a Surfactant-Free Solution Synthesis. **Nano Lett.** 12, 5407-5411, (2012).

11. Tang, J., Huo, Z., Brittman, S., Gao, H. & Yang, P. Solution-processed core-shell nanowires for efficient photovoltaic cells. **Nat. Nanotechnol.** 6, 568-572, (2011).
12. Lin, F., Hoang, D. T., Tsung, C.-K., Huang, W., Lo, S. H.-Y., Wood, J. B., Wang, H., Tang, J. & Yang, P. Catalytic properties of Pt cluster-decorated CeO<sub>2</sub> nanostructures. **Nano Res.** 4, 61-71, (2011).
13. Cao, D., Pang, P., He, J., Luo, T., Park, J. H., Krstic, P., Nuckolls, C., Tang, J. & Lindsay, S. Electronic Sensitivity of Carbon Nanotubes to Internal Water Wetting. **ACS Nano** 5, 3113-3119, (2011).
14. Tang, J., Wang, H.-T., Lee, D. H., Fardy, M., Huo, Z., Russell, T. P. & Yang, P. Holey Silicon as an Efficient Thermoelectric Material. **Nano Lett.** 10, 4279-4283, (2010).
15. Liu, H., He, J., Tang, J., Liu, H., Pang, P., Cao, D., Krstic, P., Joseph, S., Lindsay, S. & Nuckolls, C. Translocation of Single-Stranded DNA Through Single-Walled Carbon Nanotubes. **Science** (Washington, DC, U. S.) 327, 64-67, (2010).
16. Jeon, S., Lee, C., Tang, J., Hone, J. & Nuckolls, C. Growth of serpentine carbon nanotubes on quartz substrates and their electrical properties. **Nano Res.** 1, 427-433, (2008).
17. Tang, J., Wang, Y., Klare, J. E., Tulevski, G. S., Wind, S. J. & Nuckolls, C. Encoding molecular-wire formation within nanoscale sockets. **Angew. Chem., Int. Ed.** 46, 3892-3895, (2007). (Inside cover)
18. Xiao, S., Tang, J., Beetz, T., Guo, X., Tremblay, N., Siegrist, T., Zhu, Y., Steigerwald, M. & Nuckolls, C. Transferring Self-Assembled, Nanoscale Cables into Electrical Devices. **J. Am. Chem. Soc.** 128, 10700-10701, (2006).
19. Tang, J., Wang, Y., Nuckolls, C. & Wind, S. J. Chemically responsive molecular transistors fabricated by self-aligned lithography and chemical self-assembly. **J Vac Sci Technol B Microelectron Nanometer Struct Process Meas Phenom** 24, 3227-3229, (2006)
20. Tang, J., De Poortere, E. P., Klare, J. E., Nuckolls, C. & Wind, S. J. Single-molecule transistor fabrication by self-aligned lithography and in situ molecular assembly. **Microelectron. Eng.** 83, 1706-1709, (2006).
21. Guo, X., Myers, M., Xiao, S., Lefenfeld, M., Steiner, R., Tulevski, G. S., Tang, J., Baumert, J., Leibfarth, F., Yardley, J. T., Steigerwald, M. L., Kim, P. & Nuckolls, C. Chemoresponsive monolayer transistors. **Proc. Natl. Acad. Sci. USA** 103, 11452-11456, (2006).
22. Chen, Z., Appenzeller, J., Lin, Y.-M., Sippel-Oakley, J., Rinzler, A. G., Tang, J., Wind, S. J., Solomon, P. M. & Avouris, P. An integrated logic circuit assembled on a single carbon nanotube. **Science** (Washington, DC, U. S.) 311, 1735, (2006).

## PATENTS

1. Methods for Fabricating Nanoscale Electrodes and Uses Thereof.  
U.S. Pat. Appl. Publ. (2007), US 2007/0059645 A1.
2. Nanopore and Carbon Nanotube Based DNA Sequencer  
PCT Int. Appl. (2009), WO/2009/117517, PCT/US2009/037563.
3. Formation of Nanoscale Carbon Nanotube Electrodes using a self-aligned Nanogap Mask  
U.S. Pat. Appl. Publ. (2011), US 2011/0268884 A1.
4. Nanostructured Silicon with Useful Thermoelectric Properties  
U.S. Pat. Appl. Publ. (2012) 20120282435 A1
5. NANOMOTOR PROPULSION  
U.S. Prov. Pat. Appl. 62268352 (2015)
6. Graphene-Semiconductor Based Wavelength Selective Photodetector for Sub-Bandgap Photo Detection  
U.S. Prov. Pat. Appl. 62/346,706 (2016)

## Selective Awards

- Early Career Award 2014-2015, Research Grand Council, Hong Kong