

## **Youfan Hu, Ph. D.**

### **Research Scientist**

Working with Prof. Zhong Lin Wang  
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### **Education**

**Sep. 2002 – Jul. 2008 Ph. D. in Physical Electronics**  
(Supervisor: Prof. Lian-mao Peng)  
Department of Electronics, Peking University, Beijing, China

**Sep. 1998 – Jul. 2002 B. S. in Astronomy**  
Beijing Normal University, Beijing, China

### **Working Experience**

Jul. 2011 - present **Research Scientist**, Georgia Institute of Technology

Jul. 2008 - Jun. 2011 **Postdoc Fellow**, Georgia Institute of Technology

### **Research Interests:**

Energy harvesting by using piezoelectric nanomaterials; Self-powered nanosystems; Coupling effect among different properties in nanomaterials; Optical process in nanomaterials; High performance nanoelectronics; Electron transport in nano scale; Physics of nanostructured materials; Nano fabrication; Novel chemical and biological sensors.

### **Publication List:**

**Total publications: 22 First Author: 12 Total citation: over 250**

1. **Y. F. Hu**, C. Xu, Y. Zhang, L. Ling, R. L. Snyder, Z. L. Wang, “Nanogenerator for Energy Harvesting From a Rotating Tire and Its Application as a Self-Powered Pressure/Speed Sensor”, *Advanced Materials*, accepted (2011).
2. **Y. F. Hu**, Y. Zhang, C. Xu, L. Ling, R. L. Snyder, Z. L. Wang, “Self-powered System with Wireless Data Transimission”, *Nano Letters*, 11, 2572 (2011).

3. **Y. F. Hu**, Y. Zhang, C. Xu, G. Zhu and Z. L. Wang, "High-Output Nanogenerator by Rational Unipolar Assembly of Conical Nanowires and Its Application for Driving a Small Liquid Crystal Display", *Nano Letters*, 10, 4939 (2010).
4. Y. Zhang, **Y. F. Hu**, S. Xiang, and Z. L. Wang, "Effects of Piezopotential Spatial Distribution on Local Contact Dictated Transport Property of ZnO Micro / Nanowires", *Applied Physics Letters*, 97, 033509 (2010). (Co-first author)
5. **Y. F. Hu**, J. Zhou, P.-H. Yeh, Z. Li, T.-Y. Wei and Z. L. Wang, "Supersensitive and Fast Response Nanowire Sensors by Using Schottky Contact", *Advanced Materials*, 22, 3327 (2010).
6. **Y. F. Hu**, Y. Zhang, Y. L. Chang, R. L. Snyder, and Z. L. Wang, "Optimizing the Power Output of a ZnO Photocell by Piezopotential", *ACS Nano*, 4, 4220 (2010).
7. **Y. F. Hu**, Y. L. Chang, P. Fei, R. L. Snyder, and Z. L. Wang, "Designing the Electric Transport Characteristics of ZnO Micro/Nanowire Devices by Coupling Piezoelectric and Photoexcitation Effects" *ACS Nano*, 4,1234 (2010).
8. **Y. F. Hu**, Y. F. Gao, S. Singamaneni, V. V. Tsukruk, and Z. L. Wang, "Converse Piezoelectric Effect Induced Transverse Deflection of a Free-Standing ZnO Microbelt" *Nano Letters*, 9, 2661 (2009).
9. **Y. F. Hu**, Y. Liu, W. L. Li, M. Gao, X. L. Liang, Q. Li and L.-M. Peng, "Observation of a 2D Electron Gas and the Tuning of the Electrical Conductance of ZnO Nanowires by Controllable Surface Band-Bending" *Advanced Functional Materials*, 19, 2380 (2009).
10. **Y. F. Hu**, Y. Liu, H. L. Xu, X. L. Liang, L. -M. Peng, N. Lam, K. W. Wong and Q. Li, "Quantitative Study on the Effect of Surface Treatments on the Electric Characteristics of ZnO Nanowires" *The Journal of Physical Chemistry C*, 112, 14225 (2008).
11. **Y. F. Hu**, K. Yao, S. Wang, Z.Y. Zhang, X.L. Liang, Q. Chen, L.-M. Peng, Y.G. Yao, J. Zhang, W.W. Zhang and Y. Li, "Fabrication of High-Performance Top Gate Complementary Inverter Using a Single Carbon Nanotube and via a Simple Process", *Applied Physics Letters*, 90, 223116 (2007).
12. **Y. F. Hu**, X.L. Liang, Q. Chen, L.-M. Peng, and Z.D. Hu, "Electrical Characteristics of Amorphous Carbon Nanotubes and Effects of Contacts", *Applied Physics Letters*, 88, 063113 (2006).
13. S. Xu, C. Xu, Y. Liu, **Y. F. Hu**, R. S. Yang, Q. Yang, J.-H. Ryou, H. J. Kim, Z.

- Lochner, S. Choi, R. Dupuis and Z. L. Wang, “Ordered Nanowire Array Blue/Near-UV Light Emitting Diodes” *Advanced Materials*, 22, 4749 (2010).
14. Z. L. Wang, R. S. Yang, J. Zhou, Y. Qin, C. Xu, **Y. F. Hu**, S. Xu, “Lateral Nanowire/Nanobelt Based Nanogenerators, Piezotronics and Piezo-Phototronics”, *Materials Science and Engineering: R*, 70, 320 (2010).
  15. J. Zhou, Y. D. Gu, **Y. F. Hu**, W. J. Mai, P.-H. Yeh, G. Bao, A. K. Sood, D. L. Polla, and Z. L. Wang, “Gigantic Enhancement in Response and Reset Time of ZnO UV Nanosensor by Utilizing Schottky Contact and Surface Functionalization”, *Applied Physics Letters*, 94, 191103 (2009).
  16. Y. Liu, Z. Y. Zhang, H. L. Xu, L. H. Zhang, Z. X. Wang, W. L. Li, L. Ding, **Y. F. Hu**, M. Gao, Q. Li and L.-M. Peng, “Visible Light Response of Unintentionally Doped ZnO Nanowire Field Effect Transistors” *The Journal of Physical Chemistry C*, 113, 16796 (2009).
  17. K. Yao, W. W. Gong, **Y. F. Hu**, X. L. Liang, Q. Chen, L.-M. Peng, “Individual Bi<sub>2</sub>S<sub>3</sub> Nanowire-Based Room-Temperature H<sub>2</sub> Sensor” *The Journal of Physical Chemistry C*, 112, 8721 (2008).
  18. Y. Liu, Z. Y. Zhang, **Y. F. Hu**, C. H. Jin and L. M. Peng, “Quantitative Fitting of Nonlinear Current-Voltage Curves and Parameter Retrieval of Semiconducting Nanowire, Nanotube and Nanoribbon devices”, *Journal of Nanoscience and Nanotechnology*, 8, 252 (2008).
  19. Z. Y. Zhang, X. L. Liang, S. Wang, Y. Kun, **Y. F. Hu**, Y. Z. Zhu, Q. Chen, W. W. Zhou, Y. Li, Y. G. Ya, J. Zhang, L. M. Peng, “Doping-Free Fabrication of Carbon Nanotube Based Ballistic CMOS Devices and Circuits”, *Nano Letters*, 7, 3603 (2007).
  20. Z. D. Hu, **Y. F. Hu**, Q. Chen, X.F. Duan and L.-M. Peng, “Synthesis and Characterization of Amorphous Carbon Nanotubes by Pyrolysis of Ferrocene Confined within AAM Templates”, *The Journal of Physical Chemistry B* 110, 8263 (2006).
  21. B. L. Wang, Q. Chen, **Y. F. Hu**, “Niobium Doped Potassium Titanate Nanowires and Nanobelts”, *Materials Science Forum*, 475, 4089.
  22. B. L. Wang, Q. Chen, J. Hu, H. Li, **Y. F. Hu**, L. M. Peng, “Synthesis and Characterization of Large Scale Potassium Titanate Nanowires with Good Li-Intercalation Performance”, *Chemical Physics Letters*, 406 (1-3), 95 (2005).

## Conference Presentations: (one invited talk)

1. **Y. F. Hu**, X. L. Liang, Q. Chen, L.-M. Peng, and Z. D. Hu, “Electrical characteristics of amorphous carbon nanotubes and effects of contacts” *Chinese Physical Society 2006 Fall Meeting*, Beijing, China, Sep. 2006.
2. **Y. F. Hu** and Z. L. Wang, “Converse Piezoelectric Effect Induced Transverse Deflection of a Free-Standing ZnO Microbelt” *MRS Fall Meeting*, Boston, MA, Dec. 2009.
3. **Y. F. Hu** and Z. L. Wang, “Gigantic Enhancement in Response and Reset Time of ZnO UV Nanosensor by Utilizing Schottky Contact and Surface Functionalization” *MRS Fall Meeting*, Boston, MA, Dec. 2009.
4. **Y. F. Hu** and Z. L. Wang, **Invited talk**, “ZnO Nanowire Piezotronics and Piezophotonics” *MS&T 2010 Conference & Exhibition*, Houston, May, 2010.
5. **Y. F. Hu**, Y. Zhang, Y. L. Chang, R. L. Snyder and Z. L. Wang, “Optimizing the power output of a ZnO photocell by piezopotential” *MRS Spring Meeting*, San Francisco, CA, Apr. 2011.

## Conference Posters:

1. **Y. F. Hu**, K. Yao, and S. Wang, “Fabrication of carbon nanotube field effect transistors with Al<sub>2</sub>O<sub>3</sub> top gate dielectric” *ChinaNano 2007*, Beijing, China, Jun. 2007.
2. **Y. F. Hu**, Y. L. Chang, P. Fei, R. L. Snyder and Z. L. Wang, “Designing the electric transport characteristics of ZnO micro/nanowire devices by coupling piezoelectric and photoexcitation effects” *MRS Spring Meeting*, San Francisco, CA, Apr. 2011.
3. S. Xu, C. Xu, Y. Liu, **Y. F. Hu**, R. S. Yang, Q. Yang, J.-H. Ryou, H. J. Kim, Z. Lochner, S. Choi, R. Dupuis and Z. L. Wang, “Ordered nanowire array blue/near-UV light emitting” *MRS Spring Meeting*, San Francisco, CA, Apr. 2011

## Patents:

### Chinese Patent:

1. Xuelei Liang, Zhiyong Zhang, Sheng Wang, Kun Yao, Youfan Hu, Qing Chen, Lian-Mao Peng, “Nanoelectronic Device Based on Carbon Nanotubes and Its Manufacturing Method”. Assignees: Peking University, PRC. Patent No. CN101252145.

2. Lian-Mao Peng, Xuelei Liang, Qing Chen, Zhiyong Zhang, Sheng Wang, Youfan Hu, Kun Yao, “Complementary Metal-Oxide Semiconductor Circuit Based on One-Dimensional Semiconductor Nanomaterial, and Manufacturing Method”. Assignees: Peking University, PRC. Patent No. CN100505264.

**US Patent:**

1. Zhong Lin Wang, Chen Xu, Yong Qin, Guang Zhu, Rusen Yang, Youfan Hu, Yan Zhang, “Large-Scale Lateral Nanowire Arrays Nanogenerators” Assignees: Georgia Tech Research Corporation. Application Number: 12/943499. Publication Date: 05/12/2011 Filling Date: 11/10/2010. [Pending](#).

**Invitations to review the works of others:**

**Over 30 reviews** for 20 Journals, including several top and high recognized journals in the research field of Nanotechnology, such as Advanced Function Materials, The Journal of Physical Chemistry C, Langmuir, IEEE Electron Device Letters, Journal of Applied Physics, Solid State Electronics, *etc.*