Xudong Wang

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EDUCATION

Ph. D., Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA, Dec., 2005.

Master of Engineering, Chemical Engineering, Hunan University, Changsha, China, Jun., 2001.

Bachelor of Science, Materials Science and Engineering, Jilin University, Changchun, China, Jul., 1998.

APPOINTMENTS

- Sept. 2008 – Present, Assistant Professor, Department of Materials Science and Engineering, University of Wisconsin at Madison
- Sept. 2008, KAUST (King Abdullah University of Science and Technology) Research Fellow, School of Materials Science and Engineering, Georgia Institute of Technology
- Feb. 2008 – Sept. 2008, Research Scientist I, School of Materials Science and Engineering, Georgia Institute of Technology.
- Jan. 2006 – Jan. 2008, Postdoctoral Fellow, School of Materials Science and Engineering, Georgia Institute of Technology

PUBLICATIONS

Peer Reviewed Journal Publications (total citation: ~3,400; h-index: 26)

1. J. Shi, H. Hao, Y. Ding, Y, Yang, F. Wang, W. Cai, ***Xudong Wang*** "Evolution of zinc oxide nanostructures through kinetics control" *J. Mater. Chem.*, 21(2011) 9000 - 9008.
2. F. Wang, J.-H. Seo, D. Bayerl, J. Shi, H. Mi, Z. Ma, D. Zhao, Y. Shuai, W. Zhou, ***Xudong Wang*** "An aqueous solution-based doping strategy for large-scale synthesis of Sb-doped ZnO nanowires" *Nanotechnology*, 22 (2011) 225602.
3. J. Shi, ***Xudong Wang*** "Growth of Rutile Titanium Dioxide Nanowires by Pulsed Chemical Vapor Deposition" *Cryst. Growth & Design*, 11 (2011) 949-954.
4. J. Shi, C. Sun, M. B. Starr, ***Xudong Wang*** "Growth of Titanium Dioxide Nanorods in 3D-Confined Spaces." *Nano Letters*, 11 (2011) 624-631.
5. C. Sun, J. Shi, ***Xudong Wang*** "Fundamental study of mechanical energy harvesting using piezoelectric nanostructures" *J. Appl. Phys.*, 108 (2010) 034309.
6. F. Wang, Y. Hwang, P.Z.G. Qian, ***Xudong Wang*** "A Statistics-Guided Approach to Precise Characterization of Nanowire Morphology" *ACS Nano*, 4 (2010) 855-862.
7. J. Shi, ***Xudong Wang*** "Strain versus Dislocation Model for Understanding the Heteroepitaxial Growth of Nanowires", *J. Phys. Chem. C*, 114 (2010) 2082–2088.
8. J. Shi, S. Grutzik and ***Xudong Wang*** "Zn Cluster Drifting Effect for the Formation of ZnO 3D Nanoarchitecture" *ACS Nano*, 3 (2009) 1594–1602.
9. C. Xu, ***Xudong Wang*** and Z.L. Wang "Nanowire Structured Hybrid Cell for Concurrently Scavenging Solar and Mechanical Energies" *J. Am. Chem. Soc.*, 131 (2009) 5866-5872.

10. J.R. Morber, ***Xudong Wang***, J. Liu, R.L. Snyder Z.L. Wang "Wafer-Level Patterned and Aligned Polymer Nanowire/ Micro- and Nanotube Arrays on any Substrate", *Adv. Mater.*, 21 (2009) 2072-2076.
11. ***Xudong Wang***, Y.F. Gao, Y. Wei and Z.L. Wang "Output of an Ultrasonic Wave-Driven Nanogenerator in a Confined Tube", *Nano Res.*, 2 (2009) 177-182 .
12. ***Xudong Wang***, Y. Ding, Z. Li, J. Song and Z.L. Wang "Single-Crystal Mesoporous ZnO Thin Films Composed of Nanowalls", *J. Phys. Chem. C*, 113 (2009) 1791-1794,
13. Y. Qin*, ***Xudong Wang**** (*equally contributed) and Z.L. Wang "Microfiber- Nanowire Hybrid Structure for Energy Scavenging", *Nature* 451 (2008) 809-813.
14. J. Liu, P. Fei, J. Song, ***Xudong Wang***, C. Lao, R. Tummala and Z. L. Wang "Carrier density and Schottky barrier on the performance of DC nanogenerator", *Nano Lett.*, 8 (2008) 328-332.
15. J.H. Song, ***Xudong Wang***, J. Liu, H. Liu, Y. Li and Z.L. Wang "Piezoelectric potential output from ZnO wire functionalized with p-type oligomer", *Nano Lett.*, 8 (2008) 203-207.
16. J.Y. Huang, ***Xudong. Wang*** and Z.L. Wang "Bio-inspired fabrication of antireflection nanostructures by replicating fly eyes", *Nanotechnology*, 19 (2008) 025602.
17. Z.L. Wang, ***Xudong Wang***, J.H. Song, J. Liu and Y.F. Gao "Piezoelectric Nanogenerator", *IEEE Pervasive Computing* 7 (2008) 49-55. (invited review article)
18. ***Xudong Wang***, J. Song, J. Liu and Z.L. Wang "DC Nanogenerator Driven by Ultrasonic Wave", *Science* 316 (2007) 102-105.
19. ***Xudong Wang***, J. Liu, J. Song and Z.L. Wang "Integrated Nanogenerators in Bio-fluid", *Nano Lett.* 7 (2007) 2475-2479.
20. X.H. Zhang, B. Domercq, ***Xudong Wang***, S. Yoo, T. Kondo, Z.L. Wang and B. Kippelen "High performance pentacene field-effect transistors using Al_2O_3 gate dielectrics prepared by atomic layer deposition (ALD)", *Org. Electron.* 8 (2007) 718-726.
21. M. Kirkham, ***Xudong Wang***, Z.L. Wang and R.L. Snyder "Solid Au nanoparticles as a catalyst for growing aligned ZnO nanowires: a new understanding of the VLS process", *Nanotechnology* 18 (2007) 365304.
22. ***Xudong Wang***, J. Zhou, C.S. Lao, J.H. Song, N.S. Xu and Z.L. Wang "In-Situ Field Emission of Density Controlled ZnO Nanowire Arrays", *Adv. Mater.* 19 (2007) 1627–1631.
23. J. Zhou, J. Liu, ***Xudong Wang***, J. Song, R. Tummala, N.S. Xu, Z.L. Wang "Vertically Aligned Zn_2SiO_4 Nanotube/ZnO Nanowire Heterojunction Arrays", *Small* 3 (2007) 622-626.
24. ***Xudong Wang***, J. Song and Z.L. Wang "Nanowire and Nanobelt Arrays of ZnO - from synthesis to properties and to novel devices", *J. Mater. Chem.* 17 (2007) 711-720. (invited review article + cover)
25. ***Xudong Wang***, J. Zhou, J.H. Song, J. Liu, N.S. Xu and Z.L. Wang, "Piezoelectric-Field Effect Transistor and Nano-Force-Sensor Based on a Single ZnO Nanowire", *Nano Lett.* 6 (2006) 2768-2772.
26. J.H. Huang*, ***Xudong Wang**** (*equally contributed) and Z.L. Wang, "Controlled Replication of Butterfly Wings for Achieving Tunable Photonic Properties", *Nano Lett.* 6 (2006) 2325-2331. (highlighted by *Materials World*, Feb. 2007)
27. X. Feng, D.C. Sayle, Z.L. Wang, M.S. Paras, B. Santora, A.C. Sutorik, T.X.T. Sayle, Y. Yang, Y. Ding, ***Xudong Wang***, Y.S. Her "Converting Ceria Polyhedral Nanoparticles into Single-Crystal Nanospheres", *Science* 312 (2006) 1504-1508.
28. S.N. Bondi, W.J. Lackey, R.W. Johnson, ***Xudong Wang*** and Z.L. Wang "Laser assisted chemical vapor deposition synthesis of carbon nanotubes and their characterization", *Carbon* 44 (2006) 1393-1403.
29. ***Xudong Wang,*** J.H.Song and Z.L. Wang "Single Crystal Nanocastles of ZnO", *Chem. Phys. Lett.* 424 (2006) 86-90.

30. ***Xudong Wang***, J.H. Song, C.J. Summers, J.H. Ryou, P. Li, R.D. Dupuis and Z.L. Wang "Density-Controlled Growth of Aligned ZnO Nanowires Sharing a Common Contact: A Simple, Low-Cost, and Mask-Free Technique for Large-Scale Applications", *J. Phys. Chem. B* 110 (2006) 7720-7724.
31. Z.W. Wang, L.L. Daemen, Y. Zhao, C.S. Zha, R.T. Downs, ***Xudong Wang***, Z.L. Wang and R.J. Hemleys "Morphology-tuned wurtzite-type ZnS nanobelts", *Nat. Mater.* 4 (2005) 922-927.
32. J.H. Song, ***Xudong Wang***, E. Riedo and Z.L. Wang "Elastic Property of Vertically Aligned Nanowires", *Nano Lett.* 5 (2005) 1954-1958.
33. ***Xudong Wang***, C.S. Lao, E. Graugnard, C.J. Summers and Z.L. Wang "Large-Size Liftable Inverted-Nanobowl Sheets as Reusable Masks for Nanolithiography", *Nano Lett.* 5 (2005) 1784-1788.
34. ***Xudong Wang***, J. Song , P. Li , J. H. Ryou, R. D. Dupuis, C. J. Summers and Z. L. Wang "Growth of Uniformly Aligned ZnO Nanowire Heterojunction Arrays on GaN, AlN, and $Al_{0.5}Ga_{0.5}N$ Substrates" *J. Am. Chem. Soc.* 127 (2005) 7920-7923.
35. ***Xudong Wang***, C. Neff, E. Graugnard, Y. Ding, J. S. King, L. A. Pranger, R. Tannenbaum, Z. L. Wang and C. J. Summers "Photonic Crystals Fabricated Using Patterned Nanorod Arrays", *Adv. Mater*. 17 (2005) 2103-2106.
36. J. Song, ***Xudong Wang,*** E. Riedo and Z. L.Wang "Systematic Study on Experimental Conditions for Large-Scale Growth of Aligned ZnO Nanwires on Nitrides",*J. Phys. Chem. B* 109 (2005) 9869-9872.
37. ***Xudong Wang***, C. J. Summers and Z. L. Wang "Self-attraction among Aligned Au/ZnO Nanorods under Electron Beam", *Appl. Phys. Lett.* 86 (2005) 013111.
38. ***Xudong Wang***, E. Graugnard, J. S. King, Z. L. Wang, and C. J. Summers "Large-Scale Fabrication of Ordered Nanobowl Arrays", *Nano Lett.* 4 (2004) 2223-2226.
39. Yong Ding, ***Xudong Wang*** and Zhong L. Wang "Phase Controlled Synthesis of ZnS Nanobelts: Zinc Blende vs Wurtzite", *Chem. Phys. Lett.* 398 (2004) 32-36.
40. ***Xudong Wang***, C. J. Summers, Z. L. Wang "Mesoporous Single-Crystal ZnO Nanowires Epitaxially Sheathed with Zn_2SiO_4", *Adv. Mater.* 16 (2004) 1215-1218.
41. ***Xudong Wang***, Y. Ding, C. J. Summers, and Z. L. Wang "Large-Scale Synthesis of Six-Nanometer-Wide ZnO Nanobelts", *J. Phys. Chem. B* 108 (2004) 8773-8777.
42. ***Xudong Wang***, C. J. Summers, and Z. L. Wang "Large-scale Hexagonal-Patterned Growth of Aligned ZnO Nanorods for Nano-optoelectronics and Nanosensor Arrays", *Nano Lett.* 4 (2004) 423-426.
43. C. Ma, Y. Ding, D. Moore, ***Xudong Wang*** and Z.L. Wang "Single-Crystal CdSe Nanosaws", *J. Am. Chem. Soc.* 126 (2004) 708-709.
44. ***Xudong Wang***, P. Gao, J. Li, C.J. Summers and Z.L. Wang "Rectangular Porous ZnO-ZnS Nanocables and ZnS Nanotubes", *Adv. Mater.* 14 (2002) 1732-1735.
45. W.J. Xu, ***Xudong Wang***, C.H. Huang, Z.W. Liang and Y.L. Liu "Synthesis of Heterosubstituted Polysilanes through the Substitution of Polymethylphenylsilanes by Derivatives of Carboxylic Acid", *Acta Polym. Sin.* 5 (2001) 571-575.
46. ***Xudong Wang*** and W.J. Xu "Progress in the Novel Application of Reversible Thermochromic Materials", *Progress in Chemical Industry and Engineering* 3 (2000) 42-45.
47. ***Xudong Wang*** and W.J. Xu "Recent Developments in the Synthesis and Research of Optical Properties and Applications of Polysilanes" *New Chemical Materials* 7 (1999) 8-10.

Invited Book Chapters

1. J. Shi, and ***Xudong Wang*** "Bio-inspired 3D Nanoarchitectures", Chapter 2 in *Three-Dimensional Nanoarchitectures*, ed. W. Zhou et al., Springer (2011).

2. ***Xudong Wang***, and Z.L. Wang "Mechanical Energy Harvesting Using Wurtzite Nanowires", Chapter 7 in *Nano-Bio-Electronic, Photonic and MEMS Packaging*, ed. C.P. Wong et al., Springer (2009).
3. ***Xudong Wang***, Z.L. Wang, H.J. Jiang, L. Zhu, C.P. Wong and J.E. Morris "Nanomaterials and Nanopackaging", Chapter 15 in *Materials for Advanced Packaging*, ed. D. Lu and C.P. Wong, Springer (2009).
4. J. H. Song, ***Xudong Wang***, J. Liu, W. Mai, J. Zhou and Z.L. Wang "ZnO Nanowire and Nanobelts: Aligned Growth, Mechanical Properties and Applications in Nanogenerators", in *Metal oxide nanostructures for field emission applications*, ed. R.T.Rajendra Kumar, American Scientific Publishers (2008).
5. ***Xudong Wang*** and Z. L. Wang "Photonic Crystals and Devices" in *Advanced Scanning Microscopy for Nanotechnology*, ed. W. L. Zhou and Z. L. Wang, Springer (2006).
6. Z. L. Wang, ***Xudong Wang*** and R. P. Gao "Nanotubes, Nanowires and Nanobelts", in *Microsystems and Nanotechnology*, ed. Z. Y. Zhou, R. Zhu and Z. L. Wang, Science Publisher, Beijing, China (2006).
7. ***Xudong Wang*** and Z.L. Wang "Nanobelts and Nanowires of Functional Oxides", Chapter 4 in *Nanoengineering of Structural, Functional and Smart Materials*, ed. Mark.J.Schulz, CRC Press (2005).

Patents

1. ***Xudong Wang***, Jian Shi "Methods for the growth of three-dimensional nanorod networks", US Patent filed, Appl. #: 13/008,170. (Jan. 2011)
2. ***Xudong Wang***, Zhengqiang Ma, Fei Wang, Jung-Hun Seo "Wafer-scale production of single, free-standing oxides nanomembranes for transparent and flexible electronics", US Patent filed. P100129US01. (May 2010)
3. Z. L. Wang, ***Xudong Wang*** "Hybrid Solar Nanogenerator Cells" US patent No. 7,705,523 B2.
4. Z. L. Wang, ***Xudong Wang***, Y. Qin, R. Yang "Flexible Nanogenerators" US patent filed, Application No. 20090066195. (Mar. 2009).
5. Z. L. Wang, ***Xudong Wang***, J.H. Song J. Zhou, J.-H. He "Nanopiezotronics" US patent filed, US Application No. 11/760,002. (July. 2007).
6. Z. L. Wang, ***Xudong Wang***, J.H. Song "Nanowire Piezo-Electric Generators for Converting Mechanical Movement Energy, Vibration and/or Hydraulic Energy Into Electricity For Self-Powering of Wireless Nano-Bio-devices and Systems" US patent filed, US Application No. 11/608,865 (Dec. 2006).
7. ***Xudong Wang***, Z. L. Wang, E. Graugnard, J. S. King, and C. J. Summers "Large Scale Patterned Growth of Aligned One-Dimensional Nanostructures", US patent No. 7,351,607.

Invited Presentations

1. "Growth and Applications of Novel ZnO Nanomaterials", Invited seminar, ASM-Milwaukee Chapter, New Technology Night, Milwaukee, WI, Feb. 8, 2011.
2. "Multifunctional ZnO Nanostructures: from material growth to novel applications", Invited presentation, SPIE-Photonics West, San Francisco, CA, Jan. 22-27, 2011.
3. "ZnO Nanostructures for Mechanical Energy Harvesting" Invited presentation, ACerS-Electronic Materials and Applications 2011, Orlando, Jan. 19-21, 2011.
4. "Piezoelectric Zinc Oxide Nanostructures and Their Potential for Mechanical Energy Scavenging", Invited presentation, MS&T 2010 meeting, Houston, TX, October 17-21, 2010.
5. "Novel ZnO-Based Nanomaterials and Nanodevices", Invited presentation, NSF/MEXT Exchange, University of Illinois Urbana-Champaign, October 3-4, 2010.

6. "ZnO nanostructures and nanodevices", Invited seminar, School of Chemistry and Chemical Engineering, Hunan University, China, June 4, 2010.
7. "ZnO nanostructures and nanodevices", Invited seminar, School of Physical Science and Technology, Lanzhou University, China, June 2, 2010.
8. "Piezoelectric Nanostructures and Their Potential for Mechanical Energy Scavenging", Invited seminar, School of Physics, Jilin University, China, May 26, 2010.
9. "ZnO Nanostructures and Nanodevices" Invited seminar, Department of Physics, Wuhan University, China, May 24, 2010.
10. "Powering the Nanoworld", (Invited talk as 2007 TR35 honoree) Emerging Technology Conference, MIT, Boston, MA, Sept. 25-27, 2007.
11. "Nanogenerator Based on Piezoelectric Nanowires", PowerMEMS 2006, the 6th International Workshop on Micro and Nanotechnology for Power Generation and Energy Conversion Applications, Berkeley, CA, Nov. 29- Dec. 1, 2006.
12. "Oxide Nanobelts for Electromechanical Coupled Nanosensors", SPIE Optical East Symposium, Boston, Oct. 23-26, 2005.
13. "Polar-surface induced novel growth configurations of piezoelectric nanobelts", SPIE Optical East Symposium, Boston, Oct. 23-26, 2005.

AWARDS

- 3M Non-tenured Faculty Award (2011)
- Ross Coffin Purdy Award, by *American Ceramic Society* (2009)
- KAUST (King Abdullah University of Science and Technology) Research Fellow (2008)
- Sigma Xi Best Faculty Paper Award, *Georgia Tech Chapter* (2008)
- Young Innovators Under 35 Award (TR35) by *Technology Review* (2007)
- School of Materials Science and Engineering Advanced Publication Award (2006)
- School of Materials Science and Engineering Advanced Publication Award (2005)

PROFESSIONAL MEMBERSHIPS

- Member of Materials Research Society (MRS)
- Member of American Chemical Society (ACS)
- Member of American Ceramic Society (ACerS)