

Xinnan Wang, Ph.D.

Assistant Professor

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EDUCATION

- Ph.D. Mechanical Engineering, University of South Carolina, Columbia, SC, 2008
Dissertation: “*Micro/nano mechanical characterization of one-dimensional nanomaterials and biomaterials.*”
Advisor: Xiaodong Li
- M.S. Mechanical Engineering, Southern Illinois University, Carbondale, IL, 2003
Thesis: “*Mechanical analysis of a micromachined vibratory thin plate gyroscope.*”
Advisor: Tsuchin Philip Chu
- B.E. Mechanical Engineering, Harbin Institute of Technology, China, 1997

PROFESSIONAL EXPERIENCE

- 2009-present Assistant Professor, Department of Mechanical Engineering & Applied Mechanics, North Dakota State University, Fargo, ND
- 2008 Postdoctoral Researcher, Keck Laboratory, NanoCenter, University of South Carolina, Columbia, SC
- 2003-2008 Research Assistant, Nanostructures and Reliability Laboratory, University of South Carolina, Columbia, SC
- 1998-2000 Engineer, Shandong Daewoo Automotive Components, Ltd. China
- 1997-1998 Engineer, Daewoo Motors, Korea

TEACHING EXPERIENCE

- 2009 Instructor, North Dakota State University, Fargo, ND
- (MN 729) Materials characterization
- 2003-2008 Teaching Assistant and Lab Instructor, University of South Carolina, Columbia, SC
- Introduction to Materials Science for Engineers
- 2001-2003 Teaching Assistant, Southern Illinois University, Carbondale, IL
- Vector Mechanics Etc: Dynamics
 - Mechanical Engineering Design
 - Dynamic Modeling and Control of Engineering Systems

RESEARCH INTERESTS

- Rational synthesis of one dimensional inorganic nanomaterials.
- Biological virus-templated organic nanomaterials.
- Experimental mechanics of nanomaterials: instrumentation for quantitative force measurement using atomic force microscopy (AFM), nanoindentation, and nanorobotic manipulation in scanning electron microscopy (SEM).
- Electrospinning.
- Nanomachining and nanofabrication.
- Micro/nanomechanical characterization of biomaterials with Bionix system.
- Structural analysis of single/poly crystalline nanomaterials using TEM, HRTEM.
- Finite element simulations of deformation behavior of nanomaterials by nanoindentation.

JOURNAL PUBLICATIONS (PEER-REVIEWED)

* Published papers have been cited **97** times (according to Science Citation Index)

* Journal Impact factors are based on 2007 Science Citation Index Report

15. Xinyong Tao, Lixin Dong, Xinnan Wang, Wenkui Zhang, Xiaodong Li, "High Strength and Super Tough Carbon Microfiber–B₄C Nanowire Hybrid Structure and Composite from Cotton T-shirt", in review.
14. Xinnan Wang, Tao Li, Qian Wang, Xiaodong Li, "Nanomechanical characterization of raspberry-like core-shell nanocomposite", in preparation.
13. Xinnan Wang, Xiaodong Li, "Nanomeniscus Force Induced Elastic Deformation on the ZnS nanobelts ", to submit.

12. Xiaodong Li, Ming Chang, Chia-Hung Lin, Hai Ni, Xinnan Wang, Yuh J. Chao, Juti Rani Deka, "In-situ Nanomechanical Characterization of Single Crystalline Boron Nanowires by Buckling", in review.
11. Jianhua Rong, Fiona Oberbeck, Xinnan Wang, Xiaodong Li, Jerry Oxsher, Zhongwei Niu, Qian Wang, "Tobacco mosaic virus templated synthesis of one dimensional inorganic/polymer hybrid fibres", *Journal of Materials Chemistry*, 19 (2009), 2841-2845. (Impact Factor: **4.34**)
10. Jinzhu Tan, Yuh. J. Chao, John. W. Van Zee, Xiaodong Li, Xinnan Wang, Min Yang, "Assessment of Mechanical Properties of Fluoroelastomer and EPDM in a Simulated PEM Fuel Cell Environment by Microindentation Test", *Materials Science & Engineering A*, 496 (2008) 464-470. (Impact Factor: **1.457**, Time cited: 1)
9. Xinnan Wang, Zhongwei Niu, Siqi Li, Qian Wang and Xiaodong Li, "Nanomechanical Characterization of Polyaniline Coated Tobacco Mosaic Virus Nanotubes", *Journal of Biomedical Materials Research Part A*, 87A(2008) 8-14. (Impact Factor: **2.497**, Time cited: 1)
8. Xinyong Tao, Xinnan Wang, Xiaodong Li, "Nanomechanical Characterization of One-Step Combustion Synthesized $Al_4B_2O_9$ and $Al_{18}B_4O_{33}$ Nanowires", *Nano Letters*, 7 (2007) 3172-3176. (Impact Factor: **9.960**, Time cited: 8)
7. Xinnan Wang, Yongda Yan, Michael J. Yost, Shen Dong, Xiaodong Li, "Nanomechanical Characterization of Micro/nanofiber Reinforced Type I Collagens", *Journal of Biomedical Materials Research Part A*, 83A (2007) 130-135. (Impact Factor: **2.497**)
6. Xiaodong Li, Xinnan Wang, Qihua Xiong, and Peter C. Eklund, "Top-down Structure and Device Fabrication Using In-situ Nanomachining", *Applied Physics Letters*, 87 (2005) 233113, (Impact Factor: **4.308**, Time cited: 6); it is selected for the December 12, 2005 issue of *Virtual Journal of Nanoscale Science & Technology*.
5. Xiaodong Li, Xinnan Wang, Qihua Xiong, and Peter C. Eklund, "Mechanical Properties of ZnS Nanobelts", *Nano Letters*, 5 (2005) 1982-1986. (Impact Factor: **8.449**, Time cited: 34)
4. W. Ding, D.A. Dikin, X. Chen, R. D. Piner, R.S. Ruoff, E. Zussman, X. Wang, and X. Li, "Mechanics of Hydrogenated Amorphous Carbon Deposits from Electron-beam-induced Deposition of a Paraffin Precursor", *Journal of Applied Physics*, 98 (2005) 014905. (Impact Factor: **2.255**, Time cited: 33)
3. Xinnan Wang, Xiaodong Li and Michael J. Yost, "Microtensile Testing of Collagen Fibril for Cardiovascular Tissue Engineering", *Journal of Biomedical Materials Research Part A*, 74A (2005) 263-268. (Impact Factor: **3.652**, Time cited: 6)
2. Xiaodong Li, Xinnan Wang, Weiche Chang, Yuh J. Chao and Ming Chang, "Effect of Tensile Offset Angles on Micro/Nanoscale Tensile Testing", *Review of Scientific Instruments*, 76 (2005) 033904-5. (Impact Factor: **1.226**, Time cited: 1)

1. Xiaodong Li, Xinnan Wang, Robert Bondokov, Julie Morris, Yuehuei H. An, and Tangali S. Sudarshan, "Micro/Nanoscale Mechanical and Tribological Characterization of SiC for Orthopaedic Applications", *Journal of Biomedical Materials Research Part B - Applied Biomaterials*, 72B (2005) 353-361. (Impact Factor: **3.652**, Time cited: 7)

CONFERENCE PRESENTATIONS

12. Xinnan Wang, Zhongwei Niu, Siqi Li, Qian Wang, and Xiaodong Li, "Nanomechanical Characterization of Polyaniline Coated Tobacco Mosaic Virus Nanotubes," *2007 ASME International Mechanical Engineering Congress and Exhibition, Seattle, Washington, November, 11-15, 2007*.
11. Xinnan Wang, Zhongwei Niu, Siqi Li, Qian Wang and Xiaodong Li, "Nanomechanical Characterization of Polyaniline Coated Tobacco Mosaic Virus Nanotubes," *Materials Science and Technology 2007, Detroit, Michigan, September 16-20, 2007*.
10. Xiaodong Li, Yongda Yan, Xinnan Wang, Michael J. Yost, Stephen A. Fann, and Shen Dong, "Micro/Nano Tensile Testing of Fiber Reinforced Type I Collagen," *2006 ASME International Mechanical Engineering Congress and Exhibition, Chicago, Illinois, November 5-10, 2006*.
9. Xiaodong Li, Xinnan Wang, Yongda Yan, Michael J. Yost and Shen Dong, "Nanomechanical Characterization of Fiber Reinforced Type I Collagen," *2006 MRS Fall Meeting, Boston, MA, November 27-December 1, 2006*.
8. Xiaodong Li, Xinnan Wang, Hongsheng Gao, and Michael J. Yost, "Nanoscale Imaging and Mechanical Testing of Cells and Tissues," *Gordon Research Conference on Thin Films and Small Scale Mechanical Behavior, Waterville, Maine, July 30-August 4, 2006*.
7. Xiaodong Li, Xinnan Wang, Qihua Xiong, and Peter C. Eklund, "Nanoindentation Mechanical Property Measurements of 1D Nanostructures," *Oak Ridge National Laboratory Center for Nanophase Materials Sciences User Meeting, Oak Ridge, Tennessee, June 14-16, 2006*.
6. Xiaodong Li, Xinnan Wang, Hongsheng Gao, and Michael J. Yost, "Nanoscale Imaging and Mechanical Testing of Cells and Tissues," *Oak Ridge National Laboratory Center for Nanophase Materials Sciences User Meeting, Oak Ridge, Tennessee, June 14-16, 2006*.
5. Xiaodong Li, Xinnan Wang, Patrick Nardi, Hongsheng Gao, Qihua Xiong, Peter C Eklund, Catherine J Murphy, K. K Caswell, Chang-Wook Baek, Jong-Man Kim and Yong-Kweon Kim, "Mechanical Property Measurements and Mechanical Machining of Nanobuilding Blocks," *11th International Conference on New Diamond Science and Technology (ICNDST) and 9th Applied Diamond Conference (ADC), Research Triangle Park, North Carolina, May 15-18, 2006*.
4. Xiaodong Li, Xinnan Wang, Patrick Nardi, Hongsheng Gao, Qihua Xiong, Peter C Eklund, Catherine J Murphy, K. K Caswell, Chang-Wook Baek, Jong-Man Kim, and

Yong-Kweon Kim, "Top-down On-wire Structure and Device Fabrication using In-situ Nanomachining," *2006 Spring MRS Meeting, San Francisco, CA, April 17-21, 2006.*

3. Xiaodong Li, Xinnan Wang, Qihua Xiong, and Peter C. Eklund, "Nanoindentation Mechanical Property Measurements of ZnS Nanobelts," *2005 Spring MRS Meeting, San Francisco, CA, March 28-April 1, 2005.*
2. Xiaodong Li, Xinnan Wang, Wei-Che Chang, Yuh J. Chao, and Ming Chang, "How to Accurately Measure Nanoscale Materials Properties by Tensile Testing? Effect of Offset Angle on Nanoscale Tensile Measurements," *Materials Science and Technology 2004, New Orleans, Louisiana, September 26-29, 2004.*
1. Xiaodong Li, Xinnan Wang, Tangali S. Sudarshan, Yuehei H. An, Julie Morris, and Natarajan Sethuramand, "Micro/Nanomechanical and Tribological Characterization of Orthopedic Materials," *Materials Science and Technology 2004, New Orleans, Louisiana, September 26-29, 2004.*

INVITED TALKS

- University of Michigan-Flint, MI, October, 2008
- University of California at Santa Barbara, CA, October, 2008
- Arizona State University, AZ, August, 2008
- North Dakota State University, ND, August, 2008
- Villanova University, PA, March, 2008
- Oakland University, MI, March, 2007

HONORS & AWARDS

- Travel Grant Award, USC, 2007
- Outstanding Graduate Student, USC, 2006
- Outstanding Research Bearer, Daewoo Management and Development Center, Korea, 1998
- Daewoo Fellowship, South Korea, 1997 and 1998
- Consecutive scholarships for excellent undergraduate students, Harbin Institute of Technology, China, 1994-1997.

JOURNAL REVIEWS

- Acta Materialia
- Advanced Functional Materials
- Applied Physics Letters

- Journal of Advance Materials
- Journal of Applied Physics
- Journal of Biomedical Materials Research Part A
- Journal of Biomedical Materials Research Part B
- Journal of Material Research
- Journal of Material Science
- Journal of Nano Research
- Material Science and Engineering A
- Material Science and Engineering C
- Nanoscale Research Letters
- Nanotechnology
- Small

PROFESSIONAL MEMBERSHIPS

- Member of the Minerals, Metals & Materials Society (TMS), USA (2005-present)
- Member of the Materials Research Society (MRS), USA (2009- present)
- Member of the Association for Iron & Steel Technology (AIST), USA (2007-2008)
- Member of American Society for Engineering Education (ASEE), USA (2009-present)