

YONG ZHU

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RESEARCH INTERESTS

- Mechanics of low-dimensional nanomaterials
- Nanomaterial-enabled flexible and stretchable electronics for healthcare and robotics
- Advanced experimental mechanics methods with *in-situ* microscopes and spectrometers
- Nano/micro-fabrication of functional devices (using top-down and bottom-up approaches)

WORK EXPERIENCE

- **Professor**, Department of Mechanical and Aerospace Engineering, North Carolina State University, Raleigh, NC, August 2017 – present
Professor (affiliate), Departments of Materials Science and Engineering and Biomedical Engineering, North Carolina State University
- **Associate Professor**, Department of Mechanical and Aerospace Engineering, North Carolina State University, Raleigh, NC, August 2013 – July 2017
- **Assistant Professor**, Department of Mechanical and Aerospace Engineering, North Carolina State University, Raleigh, NC, August 2007 – July 2013
- **Postdoctoral Fellow**, Center for Mechanics of Solids, Structures & Materials, University of Texas at Austin, Austin, TX, November 2005 – July 2007

EDUCATION

- Northwestern University, Evanston, IL, USA
Ph.D. in Mechanical Engineering, December 2005
Thesis: Development of a Nanoscale Material Testing System and *in situ* SEM/TEM Study of the Mechanical Behavior of Nanostructures
M.S. in Mechanical Engineering, December 2001
Thesis: Micromechanical Testing and Simulation of RF MEMS Switches
- University of Science and Technology of China (USTC), Hefei, Anhui, China
B.S. in Mechanics and Mechanical Engineering, June 1999
Research project: Stress Wave Propagation in Transversely Isotropic Materials

HONORS AND AWARDS

- Eshelby Mechanics Award, 2016
- Sia Nemat-Nasser Early Career Award, ASME, 2015
- University Faculty Scholar, NCSU, 2015-2020
- Best Wearable Material/Component Development Award at IDTechEx Wearable USA Conference (America's largest event on wearable technology), 2015
- Alcoa Foundation Engineering Research Achievement Award, College of Engineering, NCSU, 2015 (one per year)
- Outstanding Research Award, Department of Mechanical & Aerospace Engineering, NCSU, 2015
- ASME Micro/Nano Forum Best Poster Award (with student Shanshan Yao), 2015

- Analytical Instrumentation Facility (AIF) Best Paper Award (with student G. Cheng), NCSU, 2015
- JSA Young Investigator Lecture Award, Society of Experimental Mechanics, 2013
- Sigma Xi Faculty Research Award, NCSU, 2012
- NC Space Grant New Investigator award, 2010
- Faculty Research and Professional Development Award, NCSU, 2008
- Who's Who in Engineering Education, 2007
- Best Poster Award (1st place), Gordon Research Conference on Thin Film & Small Scale Mechanical Behavior, 2006

PUBLICATIONS (* corresponding author, _ graduate students/postdocs, _^ undergraduate students, # equal contributions)

- >65 journal articles, 4 book chapters, >30 conference proceedings
- 4 Highly Cited Papers (top 1% in the field) published at NCSU (according to Web of Science).
- 2625 citations, H-index: 24, <http://www.researcherid.com/rid/C-4845-2008> (as of 7/2017)
- 3790 citations, H-index: 29, <http://scholar.google.com/citations?user=Gx5dkdkAAAAJ&hl=en>

Journal Articles

1. J. Cui, S. Yao, Q. Huang, J. Adams[^] and Y. Zhu*, "Controlling the self-folding of a polymer sheet by a local heater: effect of the polymer-heater interface", *Soft Matter* 13 (21), 3863-3870 (2017).
Cover Art
2. Y. Zhu*, "Mechanics of Crystalline Nanowires: An Experimental Perspective", *Applied Mechanics Reviews* 69 (1), 010802 (2017). **Invited Review**
3. S. Yao, J. Cui, Z. Cui and Y. Zhu*, "Soft Electrothermal Actuators using Silver Nanowire Heaters", *Nanoscale* 9 (11), 3797-3805 (2017). **Cover Art**
4. S. Yao, A. Myers, A. Malhotra, F. Lin, A. Bozkurt, J. F. Muth* and Y. Zhu*, "Wearable Hydration Monitor with Conformal Nanowire Electrodes", *Advanced Healthcare Materials* 6 (6), 1601159 (2017). **Cover Art, Most downloaded and read paper of the month**
5. Y. Zhang, J. Yu, J. Wang, N.J. Hanne, Z. Cui, C. Qian, C. Wang, H. Xin, J.H. Cole, C.M. Gallippi*, Y. Zhu* and Z. Gu*, "Thrombin-Responsive Transcutaneous Patch for Auto-Anticoagulant Regulation", *Advanced Materials* 29 (4), 1604043 (2017). **Cover Art**
6. J. Yu, C. Qian, Y. Zhang, Z. Cui, Y. Zhu, Q. Shen, F.S. Ligler, J.B. Buse and Z. Gu*, "Hypoxia and H₂O₂ Dual-Sensitive Vesicles for Enhanced Glucose-Responsive Insulin Delivery", *Nano Letters* 17 (2), 733-739 (2017).
7. K. Jagannadham, J. Cui and Y. Zhu, "Substrate Effects on Growth of MoS₂ Film by Laser Physical Vapor Deposition on Sapphire, Si and Graphene (on Cu)", *Journal of Electronic Materials* 46, 1010-1021 (2017).
8. J. Di, J. Yu, Q. Wang, S. Yao, D. Suo, Y. Ye, M. Pless, Y. Zhu, Y. Jing*, Z. Gu*, "Ultrasound-Triggered Noninvasive Regulation of Blood Glucose Levels Using Microgels Integrated with Insulin Nanocapsules", *Nano Research* 10, 1393-1402 (2017).
9. Z. Jiang, Z. Cui, T. Yue, Y. Zhu and D.H. Werner, "A Compact, Highly-efficient and Fully-flexible Circularly-Polarized Antenna Enabled by Silver Nanowires for Wireless Body-area Networks", *IEEE Transactions on Biomedical Circuits and Systems*, published online, DOI: 10.1109/TBCAS.2017.2671841 (2017).
10. T. Kim, A. Saini, J. Kim, A. Gopalarathnam, Y. Zhu, F.L. Palmieri, C.J. Wohl and X. Jiang*, "Piezoelectric Floating Element Shear Stress Sensor for the Wind Tunnel Flow Measurement", *IEEE Transactions on Industrial Electronics*, published online, DOI: 10.1109/TIE.2016.2630670 (2017).

11. T.-H. Chang, G. Cheng, C. Li and Y. Zhu*, "On the size-dependent elasticity of penta-twinned silver nanowires", *Extreme Mechanics Letters* 8, 177-183 (2016).
12. Y. Zhang, J. Yu, H.N. Bomba, Y. Zhu* and Z. Gu*, "Mechanical Force-Triggered Drug Delivery", *Chemical Reviews* 116, 12536-12563 (2016).
13. S. Yao and Y. Zhu*, "Nanomaterial-Enabled Dry Electrodes for Electrophysiological Sensing: A Review", *JOM* 68 (4), 1145-1155 (2016). **Invited Review**
14. J. Dieffenderfer, H. Goodell, S. Mills, M. McKnight, S. Yao, F. Lin, E. Beppler, B. Bent, B. Lee, V. Misra, Y. Zhu, O. Oralkan, J. Strohmaier, J. Muth, D. Peden, and A. Bozkurt, "Low Power Wearable Systems for Continuous Monitoring of Environment and Health for Chronic Respiratory Disease", *Journal of Biomedical and Health Informatics* 20, 1251-1264 (2016).
15. Y. Zhu*, "In-situ Nanomechanical Testing of Crystalline Nanowires in Electron Microscopes", *JOM - The Journal of The Minerals, Metals & Materials Society (TMS)* 68 (1), 84-93 (2016). **Invited Review**
16. Y. Chen, Y. Liu*, Y. Yan, Y. Zhu and X. Chen*, "Helical Coil Buckling Mechanism for a Stiff Nanowire on an Elastomeric Substrate", *Journal of the Mechanics and Physics of Solids* 95, 25-43 (2016).
17. Y. Zhang, J. Yu, Y. Zhu* and Z. Gu*, "Elastic drug delivery: could treatments be triggered by patient movement?", *Nanomedicine* 11, 323-325 (2016). **Invited Editorial**
18. G. Cheng, S. Yao, X. Sang, B. Hao, D. Zhang, Y.K. Yap and Y. Zhu*, "Evolution of Irradiation-Induced Vacancy Defects in Boron Nitride Nanotubes", *Small* 12 (6), 818-824 (2016).
19. Y. Chen, Y. Zhu, X. Chen* and Y. Liu*, "Mechanism of the Transition From In-Plane Buckling to Helical Buckling for a Stiff Nanowire on an Elastomeric Substrate", *Journal of Applied Mechanics* 83, 041011 (2016).
20. Y. Zhu* and T.H. Chang, "A Review of Microelectromechanical Systems for Nanoscale Mechanical Characterization", *Journal of Micromechanics and Microengineering* 25, 093001 (2015). **Invited Topical Review**
21. S. Yao and Y. Zhu*, "Nanomaterial-Enabled Stretchable Conductors: Strategies, Materials and Devices", *Advanced Materials* 27 (9), 1480-1511 (2015). **Invited Review, Cover Art, Top 20 hottest papers in 2015 (based on number of page views)**
22. G. Cheng, C. Miao, Q. Qin, J. Li, F. Xu, H. Haftbaradaran, E.C. Dickey, H. Gao* and Y. Zhu*, "Large Anelasticity and Associated Energy Dissipation in Single-Crystalline Nanowires", *Nature Nanotechnology* 10, 687-691 (2015).
23. Q. Qin#, Y. Sheng#, G. Cheng, X. Li, T.-H. Chang, G. Richter, Y. Zhu* and H. Gao*, "Recoverable Plasticity in Penta-twinned Metallic Nanowires Governed by Dislocation Nucleation and Retraction", *Nature Communications* 6, 5983 (2015).
24. J. Di#, S. Yao#, Y. Ye, Z. Cui, J. Yu, T. Ghosh, Y. Zhu*, Z. Gu*, "Stretch-Triggered Drug Delivery from Wearable Elastomers Containing Therapeutic Depots", *ACS Nano* 9 (9), 9407-9415 (2015).
25. V. Misra, A. Bozkurt, B. Calhoun, T.N. Jackson, J. Jur, J. Lach, B. Lee, J. Muth, O. Oralkan, M.C. Ozturk, S. Trolrier-McKinstry, D. Vashaee, D. Wentzloff, and Y. Zhu, "Flexible Technologies for Self-Powered Wearable Health and Environmental Sensing", *Proceedings of the IEEE* 103 (4), 665-681 (2015).
26. S. Narayanan, G. Cheng, Z. Zeng, Y. Zhu*, and T. Zhu*, "Strain Hardening and Size Effect in Five-fold Twinned Ag Nanowires", *Nano Letters* 5 (6), 4037-4044 (2015).
27. T. Jiang and Y. Zhu*, "Measuring Graphene Adhesion using Atomic Force Microscopy with a Microsphere Tip", *Nanoscale* 7, 10760-10766 (2015).
28. G. Guo and Y. Zhu*, "Cohesive-Shear-Lag Modeling of Interfacial Stress Transfer between a Monolayer Graphene and a Polymer Substrate", *Journal of Applied Mechanics* 82 (3), 031005 (2015).

29. Z. Cui, F.R. Pobleto, G. Cheng, S. Yao, X. Jiang and Y. Zhu*, "Design and Operation of Silver Nanowire Based Flexible and Stretchable Touch Sensors", *Journal of Materials Research* 30, 79-85 (2015). **Invited article** for a focus issue on Soft Nanomaterials
30. A.C. Myers, H. Huang and Y. Zhu*, "Wearable Silver Nanowire Dry Electrodes for Electrophysiological Sensing", *RSC Advances* 5, 11627-11632 (2015).
31. A. Gurarlan, Y. Yu, L. Su, Y. Yu, F. Suarez, S. Yao, Y. Zhu, M.C. Ozturk, Y. Zhang and L. Cao, "Surface Energy-Assisted Perfect Transfer of Centimeter-scale Monolayer and Few-layer MoS₂ Films onto Arbitrary Substrates", *ACS Nano* 8, 11522-11528 (2014).
32. G.M. Cheng, T.-H. Chang, Q. Qin, H. Huang and Y. Zhu*, "Mechanical Properties of Silicon Carbide Nanowires: Effect of Size-Dependent Defect Density", *Nano Letters* 14, 754-758 (2014).
33. L. Song, A.C. Myers, J.J. Adams and Y. Zhu*, "Stretchable and Reversibly Deformable Radio Frequency Antennas Based on Silver Nanowires", *ACS Applied Materials and Interfaces* 6, 4248-4253 (2014). **Highlighted on NSF homepage, "Stretchable Antenna for Wearable Devices" and NSF Science Now by Dena Headlee (<https://www.youtube.com/watch?v=zDk-Jp8JvkY&feature=youtu.be>)**
34. Y. Liu, R. D. Mailen, Y. Zhu, M. D. Dickey, and J. Genzer, "Simple geometric model to describe self-folding of polymer sheets", *Phys. Rev. E* 89, 042601 (2014).
35. S. Yao and Y. Zhu*, "Wearable Multifunctional Sensors using Printed Stretchable Conductors made of Silver Nanowires", *Nanoscale* 6, 2345-2352 (2014). **2014 Hot Papers in Nanoscale as recommended by referees.**
36. T. Jiang, R. Huang*, Y. Zhu*, "Interfacial Sliding and Buckling of Monolayer Graphene on a Stretchable Substrate", *Advanced Functional Materials*, 24, 396-402 (2014).
37. T.-H. Chang and Y. Zhu*, "A Microelectromechanical System For Thermomechanical Testing Of Nanostructures", *Applied Physics Letters* 103, 263114 (2013).
38. J. Ouyang, M. McDonald and Y. Zhu*, "Temperature-dependent material properties of Z-shaped MEMS thermal actuators made of single crystalline silicon", *Journal of Micromechanics and Microengineering* 23, 125036 (2013).
39. Q. Qin and Y. Zhu*, "Temperature Control in Thermal Microactuators with Applications to *in-situ* Nanomechanical Testing", *Applied Physics Letters* 102, 013101 (2013).
40. J.W. Durham and Y. Zhu*, "Fabrication of Functional Nanowire Devices on Unconventional Substrates using Strain-Release Assembly", *ACS Applied Materials & Interfaces* 5, 256-261 (2013).
41. Y. Zhu*, J.B. Tracy, J. Dong, X. Jiang, M.G. Jones and G. Childers, "Teaching a Multidisciplinary Nanotechnology Laboratory Course to Undergraduate Students", *Journal of Nano Education* 5, 17-26 (2013).
42. M. Zu, Q.-W. Li, Y.T. Zhu, Y. Zhu, G. Wang, J.-H. Byun and T.-W. Chou, "Stress relaxation in carbon nanotube-based fibers for load-bearing applications", *Carbon* 52, 347-355 (2013).
43. F. Xu and Y. Zhu*, "Highly conductive elastic conductors based on silver nanowire films", *Advanced Materials* 24 (37), 5117-5122 (2012). **Highlighted on National Nanotechnology Initiative homepage, "Nano-enabled Stretchable Electronics?"**
44. Q. Qin, F. Xu, Y. Cao, P.I. Ro and Y. Zhu*, "Effect of Clamping on Resonance Frequency and Measured Young's Modulus of a Single-Clamped Nanowire", *Small* 8 (6), 2571-2576 (2012).
45. Y. Zhu*, Q. Qin, F. Xu, F. Fan, Y. Ding, T. Zhang, B.J. Wiley, and Z.L. Wang, "Size effects on elasticity, yielding and fracture of silver nanowires: *In situ* experiments", *Phys. Rev. B* 85, 045443 (2012).
46. J. Ouyang and Y. Zhu*, "Z-Shaped MEMS Thermal Actuators: Piezoresistive Self-Sensing and Preliminary Results for Feedback Control", *Journal of Microelectromechanical Systems* 21, 596-604 (2012).

47. Y. Zhu* and F. Xu, "Buckling of aligned carbon nanotubes as stretchable conductors: a new manufacturing strategy", *Advanced Materials* 8, 1073-1077 (2012).
48. F. Xu, X. Wang, Y.T. Zhu and Y. Zhu*, "Wavy ribbons of carbon nanotubes for stretchable conductors", *Advanced Functional Materials* 22, 1279-1283 (2012).
49. F. Xu, W. Lu and Y. Zhu*, "Controlled 3D buckling of silicon nanowires for stretchable electronics," *ACS Nano* 5, 672-678 (2011). **Invited interview by the ACS Nano podcast to discuss the buckling-induced helical nanowires including its mechanics and applications to stretchable electronics, January 2011.**
50. Q. Qin and Y. Zhu*, "Static friction between silicon nanowires and elastomeric substrates," *ACS Nano* 5, 7404-7410 (2011).
51. F. Xu, J.W. Durham III[^], B.J. Wiley and Y. Zhu*, "Strain-release assembly of nanowires on stretchable substrates," *ACS Nano* 5, 1556-1563 (2011).
52. C. Guan and Y. Zhu*, "A new electrothermal microactuator with Z-shaped beams: design and characterization", *Journal of Micromechanics and Microengineering* 20, 085014 (2010).
53. F. Xu, Q. Qin, A. Mishra, Y. Gu and Y. Zhu*, "Mechanical properties of ZnO nanowires under different loading modes", *Nano Research* 3, 271-280 (2010).
54. Y. Zhu*, Q. Qin, Y. Gu and Z.L. Wang, "Friction and Shear Strength at the Nanowire-Substrate Interfaces," *Nanoscale Research Letters* 5, 291-295 (2010).
55. Y. Zhu*, F. Xu, Q. Qin, W.Y. Fung and W. Lu, "Mechanical Properties of Vapor-Liquid-Solid Synthesized Silicon Nanowires," *Nano Letters* 9, 3434-3439 (2009).
56. Y. Zhu, K.M. Liechti and K. Ravi-Chandar, "Direct extraction of rate-dependent traction-separation laws for polyurea/steel interfaces," *International Journal of Solids and Structures* 46, 31-51 (2009).
57. M. Locascio, B. Peng, P. Zapol, Y. Zhu, S. Li and H.D. Espinosa, "Compliant bridging bond defects improve strength of multiwalled carbon nanotubes," *Experimental Mechanics* 49, 169-182 (2009).
58. B. Peng, Y. Zhu, I. Petrov and H.D. Espinosa, "A microelectromechanical system for nano-scale testing of one dimensional nanostructures," *Sensor Letters* 6, 76-87 (2008).
59. H.D. Espinosa, Y. Zhu and N. Moldovan, "Design and operation of a MEMS-based nanoscale material testing system," *Journal of Microelectromechanical Systems* 16, 1219-1231 (2007).
60. A. Corigliano, L. Domenella, H.D. Espinosa and Y. Zhu, "Electro-thermal actuator for on-chip nanoscale tensile tests: Analytical modelling and multi-physics simulations", *Sensor Letters* 5, 592-607 (2007).
61. Y. Zhu, C.H. Ke and H.D. Espinosa, "Experimental techniques for mechanical characterization of one-dimensional nanostructures," *Experimental Mechanics* 47, 7-24 (2007).
62. Y. Zhu, A. Corgliano and H.D. Espinosa, "Thermal actuator for nanoscale tensile tests: design and characterization," *Journal of Micromechanics and Microengineering* 16, 242-253 (2006).
63. Y. Zhu and H.D. Espinosa, "An electro-mechanical material testing system for in-situ electron microscopy and applications," *Proceedings of the National Academy of Sciences USA* 102, 14503-14508 (2005).
64. Y. Zhu, N. Moldovan and H.D. Espinosa, "A microelectromechanical load sensor used for in-situ electron and x-ray microscopy tensile testing of nanostructures," *Applied Physics Letters* 86, 013506 (2005).
65. Z.P. Bazant, Z. Guo, H.D. Espinosa, Y. Zhu and B. Peng, "Epitaxially influenced boundary layer model for size effect in thin metallic films," *Journal of Applied Physics* 97, 073506 (2005).
66. Y. Zhu and H.D. Espinosa, "Effect of temperature on capacitive RF MEMS switch performance – a coupled-field analysis," *Journal of Micromechanics and Microengineering* 14, 1270-1279 (2004).

67. Y. Zhu and H.D. Espinosa, "Reliability of capacitive RF MEMS switches at high and low temperatures," *International Journal of RF and Microwave computer-aided engineering* 14, 317-328 (2004).
68. H.D. Espinosa, Y. Zhu, M. Fischer and J.W. Hutchinson, "An experimental/computational approach to identify moduli and residual stress in MEMS radio-frequency switches," *Experimental Mechanics* 43, 309-316 (2003).

Book Chapters

1. B. Peng, Y.G. Sun, Y. Zhu, H.-H. Wang and H.D. Espinosa, "Nanoscale testing of one-dimensional nanostructures," in *Micro and Nano Mechanical Testing of Materials and Devices*, edited by F. Yang and James C.M. Li, Springer, 2008.
2. H.D. Espinosa, Y. Zhu, B. Peng and O. Loh "Nanoscale testing of nanowires and carbon nanotubes using a microelectromechanical system," in *Advances in Multiphysics Simulation of MEMS and NEMS*, edited by N. Aluru, C. Cercignani, A. Frangi and S. Mukherjee, Imperial College Press, 2007.
3. H.D. Espinosa, Y. Zhu, and N. Moldovan, "MEMS-based material testing systems," in *Encyclopedia of Materials: Science and Technology*, edited by Patrick Veyssi re, Elsevier, 2006.
4. B.C. Prorok, Y. Zhu, H.D. Espinosa, Z.Y. Guo, Z.P. Bazant, Y.F. Zhao, and B.I. Yakobson, "Micro- and nano- mechanics," in *Encyclopedia of Nanoscience and Nanotechnology*, edited by H.S. Nalwa, American Scientific Publishers, vol. 5, pp. 555-600, 2004.

INVITED LECTURES/SEMINARS

Delivered more than 40 invited lectures/seminars in academia, industry, and government laboratories and at national and international conferences. Selected recent presentations are listed:

- "Experimental Mechanics of Low-Dimensional Nanomaterials", Department of Modern Mechanics, University of Science and Technology of China, May 2017.
- "Ultra-strength Nanostructures: from MEMS-based in-situ Nanomechanics to Stretchable Electronics", Department of Mechanical and Aerospace Engineering, University of California, Los Angeles, Apr. 2017.
- "Giant Anelasticity and Associated Energy Dissipation in Single-Crystalline Nanowires", International Congress of Theoretical and Applied Mechanics (ICTAM), Montreal, Canada, Aug. 2016.
- "Probing Adhesion and Interfacial Shear Stress Transfer of Graphene", AmeriMech Symposium on Mechanical Behavior of 2D Materials – Graphene and Beyond, Austin, TX, Apr. 2016.
- "Stretchable and Wearable Sensors using Metal Nanowires", International Union of Theoretical and Applied Mechanics (IUTAM) Symposium on Mechanics of Stretchable Electronics, Hangzhou, China, Mar. 2016.
- "In-Situ Nanomechanics of Crystalline Nanowires", Department of Mechanical and Aerospace Engineering, University of California, San Diego, Nov. 2015.
- "Stretchable and Wearable Sensors using Metal Nanowires", Seoul National University, South Korea, Nov. 2015.
- "Silver Nanowire Enabled Wearable Sensors for Health Monitoring", Medtronic, Minneapolis, MN, Oct. 2015.
- "Interfacial Mechanics of Graphene", 51st Annual Meeting of Society of Engineering Sciences, West Lafayette, IN, Oct. 2014.
- "Low-Dimensional Nanomaterials: from Mechanical Characterization to Multifunctional Nanocomposites", NASA Glenn Research Center, Apr. 2014.

EDITED VOLUMES

- Y. Zhu, D.S. Gianola and T. Zhu (Eds.), "Nanomechanics: Bridging Spatial and Temporal Scales", special issue of *Extreme Mechanics Letters*, Volume 8 (2016).
- Y. Zhu and A.T. Zehnder (Eds.), "Experimental and Applied Mechanics, Volume 4" (Proceeding of SEM 2016 annual conference), Springer, ISBN: 978-3-319-42027-1 (2016).
- W.C. Ralph, R. Singh, G.T. Piyush, R. Thakre, P. Zavattieri and Y. Zhu (Eds.), "Mechanics of Composite and Multi-functional Materials, Volume 7" (Proceeding of SEM 2016 annual conference), Springer, ISBN: 978-3-319-41765-3 (2016).
- B. Peng, C. Ke, Y. Liu and Y. Zhu (Eds.), "Testing, Measurement, and Characterization of Nanomaterials", special issue of *Journal of Nanomaterials* (2015).
- Y. Zhu, Y. Gu, J. Spanier and S. Gradecak (Eds.), "Semiconductor Nanowires: Synthesis, Property and Applications", MRS Proceeding, Spring 2014.

NEWS RELEASE

1. "Researchers Develop Wearable, Low-Cost Sensor to Measure Skin Hydration", Jan. 2017, Sports Illustrated, TechCrunch, GADGETS&WEARABLES, LifeScienceDaily, NSF Science360, Triangle Business Journal, News&Observer, and etc.
2. "Elastic Drug Delivery Technology Releases Drugs When Stretched", Aug. 2015, ACS Nano invited video, medGadget, Med Device Online, US News, News and Observer, and etc.
3. "Researchers Find Nanowires Have Unusually Pronounced 'Anelastic' Properties", NSF Science 360, Phys.org, EurekAlert!, R&D Magazine, ScienceDaily, Nanowerk, PrintedElectronicsWorld, Science Newsline and etc.
4. "Wearable Sensor Smooths Path to Long-Term EKG, EMG Monitoring", Jan. 2015, WRAL Health Team (video), NSF, Phys.org, Nanotechnology Now, medGadget, Gizmag, and etc.
5. "Researchers Devise New, Stretchable Antenna for Wearable Health Monitoring", Mar. 2014, NSF Science Now (video), MRS Materials 360, Live Science, MobiHealthNews, Medical Device Daily, medGadget, KurzweilAI News, R&D Magazine, WRAL TechWire (local news), and etc.
6. "Silver Nanowire Sensors Hold Promise for Prosthetics, Robotics", Jan. 2014, Washington Post, NSF Science 360, R&D Magazine, Gizmag, Science Daily, MobiHealthNews, Nanotechnology Now, Technician (NCSU newspaper), xataka (in Spanish), and etc.
7. "Understanding Interface Properties of Graphene Paves Way for New Applications", Aug. 2013, NSF Science 360, Materials Today, MaterialsViewsChina, Science Daily, R&D Magazine and etc.
8. "Researchers Create Highly Conductive and Elastic Conductors Using Silver Nanowires", Jul. 2012, National Nanotechnology Initiative, Materials Today, EETimes, PlasticElectronics, and etc.
9. "Researchers Devise New Means For Creating Elastic Conductors", Jan. 2012, NSF Science 360, Energy Daily, IEEE Spectrum, Materials Today, R&D Magazine and etc.
10. "Stretched Rubber Offers Simpler Method For Assembling Nanowires", Feb. 2011, NSF news, R&D Magazine, dBusinessNews, Institute of Nanotechnology, and etc.
11. "Coiled Nanowires May Hold Key To Stretchable Electronics", Jan. 2011, NSF Science 360, International Business Times, NanoWiki, News and Observer (Raleigh newspaper), and etc.
12. "Understanding Mechanical Properties of Silicon Nanowires Paves Way for Nanodevices", Nov. 2009, Materials Today, Small Times, Science Daily, Physorg, and etc.
13. "Nanostructure strength goes under the microscope", Nanotechweb, Sep. 2005.
14. "World's Smallest Universal Material Testing System", Science Daily, Sep. 2005.

PATENTS

1. Y. Zhu, A.C. Myers, S. Yao and L. Song[^], “Electrodes and Sensors Having Nanowires and Associated Methods”, Patent Application #PCT/US2015/024696, April 2015.
2. J. Muth, A.C. Myers, A. Malhot, S. Yao and Y. Zhu, “Personal Hydration Monitor”, Utility Patent Application #15160594, May 2016.

STUDENTS AND POSTDOCS ADVISED

Former PhD Students

Feng Xu 2012 (Intel), Qingquan Qin 2013 (Schlumberger), Tzu-Hsuan Chang 2016 (Georgia Tech), Shanshan Yao 2016 (NCSU), Guangming Cheng 2016 (NCSU)

Current PhD Students

Felipe Poblete, Jianxun Cui, Chengjun Li, Zheng Cui, Farhan Rahman (co-advised), Yuqi Zhang (co-advised)

MS Students

- Zheng Cui 2015 (NCSU), Amanda Myers 2014 (NCSU), John Durham 2012 (Dexcom), J. Victor Ouyang 2011 (RIT), Changhong Guan 2009 (SmallHD)

Former Post-Doctoral Research Associates

- Tao Jiang (Jinan University), Alper Gurarlsan (Istanbul Technical University), Qijin Huang (Virginia Commonwealth University)

Current Postdocs

- Shanshan Yao (1/2017 –), Guangming Cheng (1/2017 –)

TEACHING

List of Courses Taught at NCSU

1. MAE 314: Solid Mechanics
2. MAE 316: Strength of Mechanical Components
3. MAE 495: Introduction to Multidisciplinary Nanotechnology Laboratory (NSF-NUE project)
4. MAE 536: Micro/Nano Electromechanical Systems

SERVICE

Committee Assignments in the Department, School, and/or University

1. Scanning Electron Microscopy (SEM) Steering Committee, Analytical Instrumentation Facility (AIF), NCSU, 2015 – present
2. Department Seminar Committee, 2013 – present
3. Department Undergraduate Curriculum Committee, 2009-2013, 2007-2008
4. Department Faculty Search Committee in Multifunctional materials area, 2010-2011
5. Department Research Committee, 2008-2009
6. Department Faculty Search Committee in Nano/Bio area, 2008-2009
7. Judge, 21th Annual NC State University Undergraduate Research Symposium, 2011

Graduate Committee Members and Graduate School Representatives

22 PhD students and 7 MS students from MAE, MSE, ECE, BME, Chemical Engineering, Civil Engineering and Industrial Engineering

Book Reviewer

- Reviewed manuscripts of prospective books for Wiley, CRC Press and Pearson Education.

Journal Reviewer

>60 journals including the best journals in the fields of solid mechanics, materials science, nanotechnology and MEMS (*ASME journals are highlighted in bold*)

- **Solid Mechanics:** Journal of the Mechanics and Physics of Solids, **Journal of Applied Mechanics**, **Journal of Manufacturing Science and Engineering**, International Journal for Solids and Structures, International Journal of Fracture, International Journal of Plasticity, Mechanics of Materials, Experimental Mechanics, Extreme Mechanics Letters
- **Materials Science:** Acta Materialia, **Journal of Engineering Materials and Technology**, Journal of Materials Research, Scripta Materialia, Advanced Materials, Advanced Functional Materials
- **MEMS and Nanotechnology:** ACS Nano, Nano Letters, Nanoscale, Small, **IEEE/ASME Journal of Microelectromechanical Systems**, Journal of Micromechanics and Microengineering, Sensors and Actuators
- **Multidisciplinary:** Applied Physics Letters, Journal of Applied Physics, Journal of the Royal Society Interface, Langmuir, Nature Communications, Nature Nanotechnology, Polymer, Science, Science Advances, Soft Matter

Comment/Perspective

- 2017 Invited by *Science News for Students* to discuss a paper published in **Nature Materials** on mechanics of metallic nanocrystals
- 2016 Invited by *Physics Today* to discuss a paper published in **Nature** on stretchable semiconductors
- 2015 Invited by *Chemistry World* to discuss a paper published in **Science** on stretchable electronics

Proposal Reviewer

- NSF – CMMI, DMR, ECCS, EFRI and NUE
- AFOSR
- DOE – BES, NEUP
- American Chemical Society – Petroleum Research Fund (ACS PRF)
- Canada Foundation for Innovation (CFI)
- Hong Kong Research Grants Council (RGC)
- Israel Science Foundation (ISF)
- Argonne National Laboratory Center for Nanoscale Materials
- Center for Integrated Nanotechnologies (LANL and Sandia)

Reviewer for promotion and tenure cases

- 2014 University in Israel (1 case)

External examiner for PhD thesis

- 2015 University in Hong Kong (1 case)

Editorial Activities

- Associate Editor, Journal of Experimental Mechanics, 1/2017 – present
- Editor, iMechanica journal club, 2016 – 2017
- Editorial Board, Journal of Flexible Electronics, 2014 – present
- Lead Guest Editor, special issue on “Nanomechanics: Bridging Spatial and Temporal Scales”, Extreme Mechanics Letters, 2016

- Co-Guest Editor, special issue on "Testing, Measurement, and Characterization of Nanomaterials", Journal of Nanomaterials, 2014
- MRS Proceeding Editor, Semiconductor Nanowires: Synthesis, Property and Applications, 2014

Conference Organization (selected out of >30 symposia for ASME/SEM/SES/MRS and etc.)

- Track Organizer, "Materials: Genetics to Structures" Track, ASME International Mechanical Engineering Congress & Exposition, Tampa, FL, Nov. 2017.
- Scientific Advisory Board Member, 14th International Conference on Fracture, Rhodes, Greece, Jun. 2017.
- Track Co-Organizer, "Mechanics in Materials Science" (with K.T. Ramesh and L. Hu), 53rd Annual Meeting of the Society of Engineering Sciences, College Park, MD, Oct. 2016.
- Track Co-Organizer, "Materials: Genetics to Structures" Track, ASME International Mechanical Engineering Congress & Exposition, Phoenix, AZ, Nov. 2016.
- Symposium Organizer, "Mechanics across Multiple Length and Time Scales" (with P. Zavattieri and C. Ke), SEM Annual Conference and Exposition on Experimental and Applied Mechanics, Orlando, FL, Jun. 2016.

This 3-day symposium featured 7 sessions, over 30 papers in honor of Horacio Espinosa's Murray Medal

- Symposium Organizer, "Mechanics of Adhesion and Friction" (with F. DelRio and J. Xiao), ASME International Mechanical Engineering Congress & Exposition, Houston, TX, Nov. 2015.
We have been organizing this symposium in the last 5 years. It has become a well-attended symposium in the field with at least 3 sessions each year
- Symposium Co-Organizer, "Electron and Focused Ion Beam Microscopy Tools in Materials Characterization" (with Francisco Sola, David W. McComb and Michael D. Uchic), Materials Science & Technology 2015 – MS&T 2015, Columbus, OH, Oct. 2015.
- Symposium Co-Organizer, "Semiconductor Nanowires: Synthesis, Property and Applications" (with Y. Gu, J. Spanier and S. Gradecak), 2014 MRS Spring Meeting, San Francisco, CA, Apr. 2014.
- Conference Organizer, "Southeast Society of Experimental Mechanics Graduate Conference", Raleigh, NC, Mar. 2013.
- Symposium Organizer, "Mechanics of Nanostructures and Materials" (with C. Ke), SEM Annual Conference and Exposition on Experimental and Applied Mechanics, Indianapolis, IN, Jun. 2010

SOCIETY MEMBERSHIP

- American Society of Mechanical Engineers (ASME)
 - Executive Committee Member, Materials Division, ASME, 2014 – 2019 (Chair 2019)
 - Chair, Multifunctional Materials Committee, Materials Division, ASME, 2012 – 2013
- Society of Experimental Mechanics (SEM)
- Society of Engineering Sciences (SES)
- Institute of Electrical and Electronics Engineers (IEEE)
- Materials Research Society (MRS)
- Sigma Xi (Full Member), The Scientific Research Society
 - Secretary, NCSU Chapter, 2014 - 2015
 - Judge, Sigma Xi Annual Meeting & International Research Conference, 2011
- Tau Beta Pi, The Engineering Honor Society