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Education

Ph.D. Materials Science & Engineering, University of Maryland, College Park, 1993.
M.S. Physics, Peking University, Beijing, China, 1984.
B.Sc. Physics, Peking University, Beijing, China, 1982

Employment History

2009- Professor, Department of Mechanical & Aerospace Engineering and Department of Physiology & Biophysics, University at Buffalo, Buffalo, NY
2007-09 Associate Professor, Department of Mechanical & Aerospace Engineering and Department of Physiology & Biophysics, University at Buffalo, Buffalo, NY
2004-07 Assistant Professor, Department of Mechanical & Aerospace Engineering and Department of Physiology & Biophysics, University at Buffalo, Buffalo, NY
2000-04 Research Associate Professor, Department of Mechanical & Aerospace Engineering, University at Buffalo, Buffalo, NY
2000-04 Bio-MEMS Facility Director, School of Medicine, University at Buffalo, NY
1994-2000 Senior Scientist & Co-Technical Director, Materials Innovation Inc., West Lebanon, NH
1993-94 Postdoctoral Research Associate, National Institute of Standards & Technology, Gaithersburg, MD
1984-88 Assistant Professor, Department of Electrical Engineering, Beijing University of Science & Tech. Beijing, China

Research Interests

My research focuses on mechanobiology and cell mechanics. We develop novel microfluidic devices and techniques and use them to study biological processes where mechanical stimuli play an essential role. My current research includes force transduction mechanisms during traumatic brain injury (TBI), Piezo1 mediated Ca^{2+} signaling, and epithelia remodeling under fluid shear stress.

Awards & Honors

NIH Single Cell Analysis Program Phase I finalist, 2015.
Recipient of UB Sustained Achievement Award, 2015.
Visionary Innovator Award, University at Buffalo, 2006, 2012.

Results on stability and mechanics of quantum and Sharvin conductors highlighted by the American Physical Society's *Physics - spotlighting exceptional research*, NSF, MRS, ASM, etc. (2011).

SUNY Chancellor Award of Promising Inventor, 2002.

Listed as top 20 nanotechnology researchers of 2002 by Forbes/Wolfe Nanotech Report, 2002.

Work on nanoscience listed by NSF as one of the top breakthroughs of 2002, "Genomes, Cosmos, and Nano among NSF Science Highlights from 2002".

Book Chapter

1. Maneshi, M. M., Gottlieb, P. A. & Hua, S. Z. A Microfluidic Approach for Studying Piezo Channels. *Curr Top Membr* 79, 309-334 (2017).

Referred Journal publications¹⁻⁶⁵

- 1 Jetta, D., Gottlieb, P. A., Verma, D., Sachs, F. & Hua, S. Z. Shear stress induced nuclear shrinkage through activation of Piezo1 channels in epithelial cells. *Journal of cell science*, accepted.
- 2 Maneshi, M. M., Ziegler, L., Sachs, F., Hua, S. Z. & Gottlieb, P. A. Enantiomeric Abeta peptides inhibit the fluid shear stress response of PIEZO1. *Sci Rep* 8, 14267,(2018).
- 3 Maneshi, M. M., Sachs, F. & Hua, S. Z. Heterogeneous Cytoskeletal Force Distribution Delineates the Onset Ca(2+) Influx Under Fluid Shear Stress in Astrocytes. *Frontiers in cellular neuroscience* 12, 69,(2018).
- 4 Suffoletto, K., Jetta, D. & Hua, S. Z. E-cadherin mediated lateral interactions between neighbor cells necessary for collective migration. *Journal of biomechanics* 71, 159-166,(2018).
- 5 Verma, D., Bajpai, V. K., Ye, N., Maneshi, M. M., Jetta, D., Andreadis, S. T., Sachs, F. & Hua, S. Z. Flow induced adherens junction remodeling driven by cytoskeletal forces. *Experimental cell research* 359, 327-336,(2017).
- 6 Maneshi, M. M., Maki, B., Gnanasambandam, R., Belin, S., Popescu, G. K., Sachs, F. & Hua, S. Z. Mechanical stress activates NMDA receptors in the absence of agonists. *Sci Rep* 7, 39610,(2017).
- 7 Mang, T. S., Maneshi, M. M., Shucard, D. W., Hua, S. Z. & Sachs, F. Effects of Low-Level Laser Exposure on Calcium Channels and Intracellular Release in Cultured Astrocytes. *Proceeding of SPIE* 9695, 9695091-9695010,(2016).
- 8 Maneshi, M. M., Sachs, F. & Hua, S. Z. A Threshold Shear Force for Calcium Influx in an Astrocyte Model of Traumatic Brain Injury. *J Neurotrauma* 32, 1020-1029,(2015).
- 9 Verma, D., Meng, F., Sachs, F. & Hua, S. Z. Flow-induced focal adhesion remodeling mediated by local cytoskeletal stresses and reorganization. *Cell adhesion & migration* 9, 432-440,(2015).
- 10 Suffoletto, K., Ye, N., Meng, F., Verma, D. & Hua, S. Z. Intracellular forces during guided cell growth on micropatterns using FRET measurement. *J. Biomech.* 48, 627-635,(2014).

- 11 Ye, N., Verma, D., Meng, F., Davidson, M. W., Suffoletto, K. & Hua, S. Z. Direct observation of alpha-actinin tension and recruitment at focal adhesions during contact growth. *Experimental cell research* **327**, 57-67,(2014).
- 12 Larsen, B. R., Assentoft, M., Cotrina, M. L., Hua, S. Z., Nedergaard, M., Kaila, K., Voipio, J. & MacAulay, N. Contributions of the Na(+)/K(+)-ATPase, NKCC1, and Kir4.1 to hippocampal K(+) clearance and volume responses. *Glia* **62**, 608-622,(2014).
- 13 Hua, S. Z. Mapped! A machinery of degranulation in mast cells. Focus on "Serum- and glucocorticoid-inducible kinase SGK1 regulates reorganization of actin cytoskeleton in mast cells upon degranulation". *Am J Physiol Cell Physiol* **304**, C36-37,(2013).
- 14 Assentoft, M., Kaptan, S., Fenton, R. A., Hua, S. Z., de Groot, B. L. & MacAulay, N. Phosphorylation of rat aquaporin-4 at Ser(111) is not required for channel gating. *Glia* **61**, 1101-1112,(2013).
- 15 Armstrong, J. N., Hua, S. Z. & Chopra, H. D. Anisotropic Curie temperature materials. *Phys Status Solidi B* **250**, 387-395,(2013).
- 16 Verma, D., Ye, N., Meng, F., Sachs, F., Rahimzadeh, J. & Hua, S. Z. Interplay between cytoskeletal stresses and cell adaptation under chronic flow. *PloS one* **7**, e44167,(2012).
- 17 Bathany, C., Beahm, D. L., Besch, S., Sachs, F. & Hua, S. Z. A microfluidic platform for measuring electrical activity across cells. *Biomicrofluidics* **6**, 34121,(2012).
- 18 Heo, J., Sachs, F., Wang, J. & Hua, S. Z. Shear-induced volume decrease in MDCK cells. *Cell Physiol Biochem* **30**, 395-406,(2012).
- 19 Armstrong, J. N., Gande, E. M., Vinti, J. W., Hua, S. Z. & Chopra, H. D. Physical properties of a two-component system at the Fermi and Sharvin length scales. *J Appl Phys* **112**,(2012).
- 20 Armstrong, J. N., Hua, S. Z. & Chopra, H. D. Strength of metals at the Fermi length scale. *Phys Status Solidi-R* **6**, 99-101,(2012).
- 21 Rahimzadeh, J., Meng, F., Sachs, F., Wang, J., Verma, D. & Hua, S. Z. Real-time observation of flow-induced cytoskeletal stress in living cells. *Am J Physiol Cell Physiol* **301**, C646-652,(2011).
- 22 Ye, N., Bathany, C. & Hua, S. Z. Assay for molecular transport across gap junction channels in one-dimensional cell arrays. *Lab on a chip* **11**, 1096-1101,(2011).
- 23 Bathany, C., Beahm, D., Felske, J. D., Sachs, F. & Hua, S. Z. High throughput assay of diffusion through Cx43 gap junction channels with a microfluidic chip. *Analytical chemistry* **83**, 933-939,(2011).
- 24 Armstrong, J. N., Hua, S. Z. & Chopra, H. D. Mechanics of quantum and Sharvin conductors. *Phys Rev B* **83**,(2011).
- 25 Kowalsky, G. B., Beam, D., Oh, M. J., Sachs, F., Hua, S. Z. & Levitan, I. Cholesterol depletion facilitates recovery from hypotonic cell swelling in CHO cells. *Cell Physiol Biochem* **28**, 1247-1254,(2011).
- 26 Armstrong, J. N., Hua, S. Z. & Chopra, H. D. Cooperative motion of domain walls in magnetic multilayers. *Phys Rev B* **83**,(2011).
- 27 Hua, S. Z., Gottlieb, P. A., Heo, J. & Sachs, F. A mechanosensitive ion channel regulating cell volume. *Am J Physiol Cell Physiol* **298**, C1424-1430,(2010).
- 28 Wang, J., Heo, J. & Hua, S. Z. Spatially resolved shear distribution in microfluidic chip for studying force transduction mechanisms in cells. *Lab on a chip* **10**, 235-239,(2010).

- 29 Armstrong, J. N., Schaub, R. M., Hua, S. Z. & Chopra, H. D. Channel saturation and conductance quantization in single-atom gold constrictions. *Phys Rev B* **82**,(2010).
- 30 Hua, S. Z. & Pennell, T. A microfluidic chip for real-time studies of the volume of single cells. *Lab on a chip* **9**, 251-256,(2009).
- 31 Heo, J. H., S. Z. An Overview of Recent Strategies in Pathogen Sensing. *Sensors* **9**, 19,(2009).
- 32 Heo, J., Meng, F. & Hua, S. Z. Contribution of aquaporins to cellular water transport observed by a microfluidic cell volume sensor. *Analytical chemistry* **80**, 6974-6980,(2008).
- 33 Huntington, M. D., Armstrong, J. N., Sullivan, M. R., Hua, S. Z. & Chopra, H. D. Mechanistic understanding of transition between quantized conductance plateaus under strain perturbation. *Phys Rev B* **78**,(2008).
- 34 Heo, J., Meng, F., Sachs, F. & Hua, S. Z. Dynamic effects of Hg²⁺-induced changes in cell volume. *Cell biochemistry and biophysics* **51**, 21-32,(2008).
- 35 Pennell, T., Suchyna, T., Wang, J., Heo, J., Felske, J. D., Sachs, F. & Hua, S. Z. Microfluidic chip to produce temperature jumps for electrophysiology. *Analytical chemistry* **80**, 2447-2451,(2008).
- 36 Wang, J. B., Sullivan, M. & Hua, S. Z. Electrolytic-bubble-based flow sensor for microfluidic systems. *J Microelectromech S* **16**, 1087-1094,(2007).
- 37 Boehm, D. A., Gottlieb, P. A. & Hua, S. Z. On-chip microfluidic biosensor for bacterial detection and identification. *Sensor Actuat B-Chem* **126**, 508-514,(2007).
- 38 Li, X. L., Hua, S. Z., Chopra, H. D. & Tao, N. J. Formation of atomic point contacts and molecular junctions with a combined mechanical break junction and electrodeposition method. *Micro Nano Lett* **1**, 83-88,(2006).
- 39 Hua, S. Z., Sullivan, M. R. & Armstrong, J. N. Single-atom spintronics. *T Nonferr Metal Soc* **16**, S146-S153,(2006).
- 40 Chopra, H. D., Sullivan, M. R., Armstrong, J. N. & Hua, S. Z. The quantum spin-valve in cobalt atomic point contacts. *Nature materials* **4**, 832-837,(2005).
- 41 Ateya, D. A., Sachs, F., Gottlieb, P. A., Besch, S. & Hua, S. Z. Volume cytometry: microfluidic sensor for high-throughput screening in real time. *Analytical chemistry* **77**, 1290-1294,(2005).
- 42 Ateya, D. A., Shah, A. A. & Hua, S. Z. Impedance-based response of an electrolytic gas bubble to pressure in microfluidic channels. *Sensor Actuat a-Phys* **122**, 235-241,(2005).
- 43 Sullivan, M. R., Pirotta, S. J., Chernenko, V. A., Wu, G. H., Balasubramaniam, G., Hua, S. Z. & Chopra, H. D. Magnetic mosaics in crystalline tiles: The novel concept of polymagnets (invited). *Int J Appl Electrom* **22**, 11-23,(2005).
- 44 Sullivan, M. R., Boehm, D. A., Ateya, D. A., Hua, S. Z. & Chopra, H. D. Ballistic magnetoresistance in nickel single-atom conductors without magnetostriction. *Phys Rev B* **71**,(2005).
- 45 Ateya, D. A., Shah, A. A. & Hua, S. Z. An electrolytically actuated micropump. *Rev Sci Instrum* **75**, 915-920,(2004).
- 46 Hua, S. Z. & Chopra, H. D. 100,000% ballistic magnetoresistance in stable Ni nanocontacts at room temperature. *Phys Rev B* **67**,(2003).

- 47 Hua, S. Z., Sachs, F., Yang, D. X. & Chopra, H. D. Microfluidic actuation using electrochemically generated bubbles. *Analytical chemistry* **74**, 6392-6396,(2002).
- 48 Chopra, H. D. & Hua, S. Z. Ballistic magnetoresistance over 3000% in Ni nanocontacts at room temperature. *Phys Rev B* **66**,(2002).
- 49 Chopra, H. D., Ludwig, A., Quandt, E., Hua, S. Z., Brown, H. J., Swartzendruber, L. J. & Wuttig, M. Magnetic mesostructure of giant magnetostrictive spring magnet type multilayers. *J Appl Phys* **85**, 6238-6240,(1999).
- 50 Chopra, H. D., Hua, S. Z., Lashmore, D. S., Shull, R. D., Egelhoff, J., W.F. & Swartzendruber, L. J. Review Article: Domain behavior in single films, multilayers and nanocomposites. *Microscopy & Analysis* **28**,(1998).
- 51 Hua, S. Z., Lashmore, D. S., Swartzendruber, L. J., Egelhoff, W. F., Raj, K. & Chopra, H. D. Observation of domain dynamics in giant magnetoresistive Co-Cu-based polycrystalline multilayers. *J Appl Phys* **81**, 4582-4584,(1997).
- 52 Chopra, H. D., Hockey, B. J., Chen, P. J., Egelhoff, W. F., Wuttig, M. & Hua, S. Z. Nanostructural considerations in giant magnetoresistive Co-Cu-based symmetric spin valves. *Phys Rev B* **55**, 8390-8397,(1997).
- 53 Chopra, H. D., Hockey, B. J., Swartzendruber, L. J., Hua, S. Z., Chen, P. J., Raj, K., Lashmore, D. S., Wuttig, M. & Egelhoff, W. F. Giant magnetoresistance in symmetric spin-valves: Nanostructure and domain dynamics. *Nanostruct Mater* **9**, 451-454,(1997).
- 54 Bennett, L. H., McMichael, R. D., Swartzendruber, L. J., Hua, S., Lashmore, D. S., Shapiro, A. J., Gornakov, V. S., Dedukh, L. M. & Nikitenko, V. I. Magneto-optical Indicator Film Observation of Domain-Structure in Magnetic Multilayers. *Appl Phys Lett* **66**, 888-890,(1995).
- 55 Hua, S. Z., Salamancariba, L., Bennett, L. H., Swartzendruber, L. J., McMichael, R. D., Lashmore, D. S. & Schlesinger, M. Giant Magnetoresistance of Electrodeposited Conic/Cu Multilayers. *Scripta Metall Mater* **33**, 1643-1646,(1995).
- 56 Bennett, L. H., McMichael, R. D., Swartzendruber, L. J., Hua, S., Lashmore, D. S., Shapiro, A. J., Gornakov, V. S., Dedukh, L. M. & Nikitenko, V. I. Dynamics of Domain-Structure in Magnetic Multilayers. *Ieee T Magn* **31**, 4088-4090,(1995).
- 57 Nikitenko, V. I., Gornakov, V. S., Dedukh, L. M., Bennett, L. H., McMichael, R. D., Swartzendruber, L. J., Hua, S. Z., Lashmore, D. L. & Shapiro, A. J. Direct Experimental Study of Domain Structure in Magnetic Multilayers. *Mat. Res. Soc.* **79**,(1995).
- 58 Hua, S. Z., Lashmore, D. S., Salamancariba, L., Schwarzacher, W., Swartzendruber, L. J., McMichael, R. D., Bennett, L. H. & Hart, R. Giant Magnetoresistance Peaks in Conic/Cu Multilayers Grown by Electrodeposition. *J Appl Phys* **76**, 6519-6521,(1994).
- 59 Hua, S. Z., Salamancariba, L., Wuttig, M. & Soltani, P. K. Microstructural Studies of Photoluminescent Thin-Films of Srs-Eu²⁺,Sm³⁺. *J Cryst Growth* **141**, 165-174,(1994).
- 60 Su, Q. M., Hua, S. Z. & Wuttig, M. Nondestructive Dynamic Evaluation of Thin Niti Film Adhesion. *J Adhes Sci Technol* **8**, 625-633,(1994).
- 61 Su, Q. M., Hua, S. Z. & Wuttig, M. Martensitic-Transformation in Ni₅₀ti₅₀ Films. *J Alloy Compd* **212**, 460-463,(1994).
- 62 Hua, Z., Salamancariba, L., Wuttig, M. & Soltani, P. K. Temperature-Dependence of Photoluminescence in Srseu²⁺, Sm³⁺ Thin-Films. *J Opt Soc Am B* **10**, 1464-1469,(1993).

- 63 Zhang, J. G., Eklund, P. C., Hua, Z. L., Salamancariba, L. G., Wuttig, M., Soltani, P. K. & Storti, G. M. Photoluminescence and Optical-Absorption in Cas-Eu²⁺-Sm³⁺ Thin-Films. *J Mater Res* **7**, 411-417,(1992).
- 64 Qin, G. G. & Hua, Z. L. The Convergent Effect of the Annealing Temperatures of Electron-Irradiated Defects in Fz Silicon Grown in Hydrogen. *Solid State Commun* **53**, 975-978,(1985).
- 65 Hua, S. Z., Qin, G. & Zhou, J. Three Kinds of Hydrogen-Related Electron Irradiated Defects in Silicon Grown in Hydrogen. *Chinese Phys. Lett.* **2**,(1985).

Patents

1. U.S. Patent # 8,397,311: “Metrology probe and method of configuring a metrology probe” Harsh Deep Chopra, Jason N. Armstrong and Zonglu (Susan) Hua, 03-12-2013.
2. US Patent # 8,372,600 B2: “Method and apparatus for measuring changes in cell volume”, F. Sachs, S. Z. Hua, H. Chopra, P. Gottlieb, D. Ateya and S. Besch, 2-25-2009.
3. US Patent # 7,425,826: “Selectively conductive structure wherein a magnetic conductor is sized to have a cross-section diameter similar to a Fermi wavelength of electrons”, Harsh Deep Chopra, Zonglu Hua, and Matthew R. Sullivan, and Jason N. Armstrong, 9-16-2008.
4. US Patent # 5,982,073: "Low core-loss, well bonded ferromagnetic parts" by D. S. Lashmore, Z. Hua, L. Deresh, and G. Beane, 11-09-99.
5. US Patent # 6,129,790: “Low core loss, well bonded soft magnetic” by D. S. Lashmore, Z. Hua, L. Deresh, and G. Beane, 10-10-2000.
6. US Patent # 6,251,514: “Ferromagnetic powder for low core loss, well-bonded parts, parts made therefrom and methods for producing same”. D. S. Lashmore, G. Beane, L. Deresh, and Z. Hua, 1-26-2001.
7. US Patent # 6,309,748: “Ferromagnetic powder for low core loss parts”. D. S. Lashmore, G. Beane, L. Deresh, and Z. Hua, 10-30-2001.
8. US Patent # 6,342,108: “Low core loss, well bonded soft magnetic stator, rotor, and armature”. D. S. Lashmore, G. Beane, L. Deresh, and Z. Hua, 1-29-2002.
9. US Patent # 6,340,397: “Method for making low core loss, well bonded, soft magnetic parts”. D. S. Lashmore, G. Beane, L. Deresh, and Z. Hua, 1-22-2002.

Invited Talks

1. “Impedance Based Microfluidic Devices to Study Cell Physiology”, Pittcon 2014, Chicago, 2014.
2. “Direct measurement of flow-induced force transduction in cross-linking proteins using novel FRET probes”, Department of Oral Biology, UB, 2014.
3. “Real-Time Measurements of Cellular Transport Using Microfluidic Chips”, National University of Singapore, Singapore, 2010.
4. “Studies of Cell Volume Response to Physical & Chemical Stimuli Using Microfluidic Chip”, Virginia Tech, Blacksburg, VT, 2008.
5. “Cellular Transport Studies Using Cell Volume Sensor” University of Washington, Seattle, 2008.

6. "Microfluidic Lab Chip for High Throughput Drug Screening and Toxicity Detection" University of Maryland, 2008.
7. "Studies of Cell volume Response to Environmental Variables Using Microfluidic Chip", CBE, UB, 2008.
8. "Cell-based Biosensors", 5th Int'l Forum on Advanced Material Science & Technology, China, 2006.
9. "Single Atom Spintronics", Int'l Forum on Advanced Material Science & Technology, Xiangtan, China, 2006.
10. "New High Throughput Cell Volume Screening Technology", Ion Channel Targets Conf., Boston, MA, 2005.
11. "Nano/Bio-Technologies", Atlantic Nano Forum, VA, 2005.
12. "Microfluidic cell volume cytometry", Annual Meeting of American Society for Cell Biology, Symposium on Thermal and Mechano-Sensation, Washington DC, 2004.
13. "Microfluidic Bio-MEMS", 3rd Annual Emerging Information Technology Conf. Princeton, 2003.
14. "Electrolysis Bubble Actuated Microfluidic Systems", Microfluidic group, NIST, MD, 2003.
15. "Electrolysis Bubble Actuated Microfluidic Systems", Department of Physics, UCF, FL, 2002.

Conference Proceedings and Abstracts

1. "Enantiomeric A β Peptides Inhibit the Fluid Shear Stress Response of PIEZO1", by P. A. Gottlieb, M. M. Maneshi, F. Sachs, S. Z. Hua, *Biophysical Journal*, 116 (3), 460a, 2019.
2. "Piezo1 Mediated Ca²⁺ Signaling Causes Nuclear Shrinkage under Fluid Shear Stress", by D. Jetta, P. A. Gottlieb, F. Sachs, S. Z. Hua, *Biophysical Journal*, 116 (3), 460a, 2019.
3. "*Shear stress induced calcium dependent nuclear deformation in epithelial cells*", by D. Jetta, D. Verma, M. M. Maneshi, & S. Z. Hua, *Proc. ASME Int'l Mech. Eng. Cong. & Exp. Pittsburg, PA, IMECE2018-87650*, 2018.
4. "*In situ* measurements of protein forces and intracellular Ca²⁺ under fluid shear stimuli", by M. Maneshi, F. Sachs and S. Z. Hua, *Biophysical Society 61st Annual Meeting*, New Orleans, Louisiana, February 11-15, 2017.
5. "Shear stress stimulated MSC activities: direct changes of membrane tension or cytoskeletal stress?", by M. Maneshi, F. Sachs and S. Z. Hua, *Biophysical Society 61st Annual Meeting*, New Orleans, Louisiana, February 11-15, 2017.
6. "Enantiomeric forms of Abeta peptides inhibit the fluid shear stress response of PIEZO1", by P. A. Gottlieb, M. Meneshi, R. Gnanasambandam, F. Sachs and S. Z. Hua, *Biophysical Society 61st Annual Meeting*, New Orleans, Louisiana, February 11-15, 2017.
7. "Low level laser exposure influence on calcium channels and intracellular release in cultured astrocytes", by T. Mang, M. Maneshi, D. Shucard, S. Z. Hua and F. Sachs, *SPIE Mechanisms of Photobiomodulation Therapy XI*, San Francisco, CA (2016) (Invited talk).
8. "Gating of aquaporin 4-phosphorylation versus protonation", Assentoft, M, Kaptan, S, Fenton, RA, Hua, SZ, Degroot, BL, MacAulay, N. *GLIA*, 63, E-446-E446, (2015); *The 12th European Meeting on Glial Cell Function in Health and Disease*, Bilbao, SPAIN.

9. "NMDA receptors are sensitive to shear stress", by M. Maneshi, B. Maki, G. K. Popescu and S. Z. Hua, *J. Head Trauma Rehabilitation*, 30, ppE98-E99, (2015); *The 12th Annual Conference on Brain Injury*, San Antonio, Texas.
10. "Role of fluid shear stress on E-cadherin dynamics and cytoskeletal stresses", by Deepika Verma, Nannan Ye and Susan Z. Hua, *Northeastern Biomedical Engineering Conf*, Troy, NY (2015).
11. "Effects of low level laser exposure on calcium channels and intracellular release in cultured astrocytes", by T. Mang, M. Maneshi, D. Shucard, S. Z. Hua, F. Sachs, *The 35th Annual Conference of the American Society for Laser Medicine and Surgery*, Kissimmee, Florida (2015).
12. "Early Calcium response in astrocytes to controlled shear stimuli", by M. M. Maneshi F. Sachs, and S. Z. Hua, by M. M. Maneshi F. Sachs, and S. Z. Hua, *Brain Injury*, 28, pp771-772 (2014); *IBIA 10th World Congress on Brain Injury*, San Francisco.
13. "Real-time Measurement of Intercellular Stresses in Cells Grown on Micropatterns", by K. Suffoletto, N. Ye, F. Meng, F. Sachs, and S. Z. Hua, *Biomaterials 2013 Annual Meeting and Exposition*, Boston (2013).
14. "Phosphorylation of aquaporin-4 at Ser111 is not required for channel gating", by M. Assentoft, S. Kaptan, R. Fenton, S. Z. Hua, B. L. de Groot, and N. MacAulay, *11th European Meeting on Glial Cell Function in Health and Disease*, Berlin, Germany, July 03-06 (2013).
15. "Mechanisms of K⁺-clearance in the brain: the Na⁺/K⁺-ATPase as the key contributor", by B. R. Larsen, M. Assentoft, S. Z. Hua, K. Kaila, J. Voipio, and N. MacAulay, *11th European Meeting on Glial Cell Function in Health and Disease*, Berlin, Germany, July 03-06 (2013).
16. "Real time observation of cytoskeletal stresses and subsequent focal adhesion remodeling in live cells", by N. Ye, D. Verma, F. Meng, F. Sachs, and S. Z. Hua, *Experimental Biology*, San Diego (2012).
17. "A microfluidic assay for measuring electrical conductivity of gap junction channels", by Cédric Bathany, Derek Beahm, Steve Besch, Frederick Sachs, and Susan Z. Hua, *Mater. Res. Soc. Symp. Proc.* (2011).
18. "A Microfluidic chip for studying intercellular communication via gap junction channels" by Cédric Bathany , Thomas Suchyna, Susan Z. Hua, *Proc. NEMB*, 2010-13135, ASME First Global Congress on NanoEngineering for Medicine and Biology, Houston, TX, Feb. 7-10 (2010).
19. "Development of Microfluidic Chips to Study the Effects of Shear Stress on Cell Functions" by Jianbin Wang, Jinseok Heo, Susan Z. Hua, *Proc. NEMB*, 2010-13132, ASME First Global Congress on NanoEngineering for Medicine and Biology, Houston, TX, Feb. 7-10 (2010).
20. "Cationic Mechanosensitive Ion Channels Are Not the Sole Cell Volume Sensors for RVD" by Susan Z. Hua, Jinseok Heo, Philip Gottlieb, Frederick Sachs, *Biophysical Annual Meeting*, Boston, MA, Feb. 27-Mar. 4 (2009).
21. "Dynamic effects of Hg²⁺-induced changes in cell volume" by Jinseok Heo, Fanjie Meng, Fred Sachs, and Susan Z. Hua, *ACS National Meeting*, New Orleans, LA, April 6-10, (2008).

22. "High-speed microfluidic thermal stimulator for temperature-activated ion channel studies" by Thomas Pennell, Jianbin Wang, Susan Z. Hua, *Proc. SPIE*, 6528, 65280N1-8 (2007).
23. "Surface functionalization of a microfluidic biosensor for bacteria detection and identification" by D. A. Boehm, P. Gottlieb, S. Z. Hua, *Proc. SPIE*, 6529, 65290H1-8 (2007).
24. "Contribution of Aquaporins on Cellular Water Transport Observed Using Microfluidic Cell Volume Sensor" Jinseok Heo, Fanjie Meng, and Susan Z. Hua, *Annual meeting of Cell Biology*.(2006).
25. "An integrated approach to flow sensing and actuation using electrolytic bubbles", by J. Wang, D. A. Ateya, J. N. Armstrong, M. R. Sullivan and S. Z. Hua, *Proc. SPIE*, 6174, pp. 650-657 (2006).
26. "Microfluidic Cell Volume Biosensor for High Throughput Screening", by D. A. Ateya, F. Sachs, and S. Z. Hua, *Mater. Res. Soc. Symp. Proc.* 845, AA5.12.1 (2004).
27. "Bubble based microfluidic sensing", D. A. Ateya, A. A. Shah, F. Sachs, and S. Z. Hua, *Proc. ASME Int'l Mech. Eng. Cong. & Exp. Anaheim, CA*, IMECE2004-62177 (2004).
28. "Ballistic nanocontacts for magnetic and chemical sensing" (Invited); Harsh Deep Chopra and Susan Z. Hua*, *Nanomaterials 2004 Conference, Stamford, CT*, pp.1-8 (2004).
29. "Sequential electrolytic bubble-based micropump dosing system", by M. Lewandowski, D. A. Ateya, A. A. Shah, S. Z. Hua, *Proc. ASME Int'l Mech. Eng. Cong. & Exp. Washington, DC*, IMECE2004-41314, pp.1-5, (2003).
30. "Electrochemically actuated microvalves for microfluidic systems", by S. Z. Hua, F. Sachs, and H. D. Chopra, *Proc. ASME Int'l Mech. Eng. Cong. & Exp. New Orleans, FL*. IMECE2002-34387, pp.1-6 (2002).
31. "Evaluation of mechanical properties of magnetic materials using a non-destructive method" by D. X. Yang, K. P. Kankolenski, S. Z. Hua, L. J. Swartzendruber, G. E. Hicho, and H. D. Chopra. *IEEE Transactions on Magnetics*, 37, no.4, pp.2758-2760 (2001).
32. "Non-destructive evaluation of mechanical properties of magnetic materials", by K. P. Kankolenski, S. Z. Hua, D. X. Yang, G. E. Hicho, L. J. Swartzendruber, Z. Zang, and H. D. Chopra, *Mat. Res. Soc. Symp. Proc.* 591, 157 (2000).
33. "Electrochemically synthesized magnetoresistance and giant magnetoresistance sensors", by D. S. Lashmore, and S. Z. Hua. *Proceedings SENSORS EXPO Baltimore*, pp.323-326, (1999).
34. "Giant magnetoresistivity in electrochemically produced cobalt-copper multilayers" by D. S. Lashmore, and S. Z. Hua. *Polycrystalline Thin Films: Structure, Texture, Properties, and Applications II. Symposium. Mater. Res. Soc.* pp.161-70, (1996).
35. "Progress in the electrodeposition of multilayered alloys" by D. S. Lashmore and S. Z. Hua. *Proc. 4th Intl. Symposium on Magnetic Materials, Processes, and Devices. Applications to Storage and Microelectromechanical Systems (MEMS). Electrochem. Sco.* pp.122-124 (1996).
36. "Magnetoresistance of Electrochemically Synthesized Multilayers", D. S. Lashmore, S. Hua, and Y. Zhang, *Abstracts of Papers of the Amer. Chem. Soc.* 208, 184 (1994).
37. "TEM study of MOCVD grown InSb/GaAs heterostructures with and without TMI_n predeposited layers" by L. H. Kuo, S. Z. Hua, L. Salamanca-Riba, D. L. Partin, L. Green, J.

- Heremans. *Compound Semiconductor Epitaxy Symposium. Mater. Res. Soc.* pp.405-410, (1994).
38. "Martensitic transformation in Ni/sub 50/Ti/sub 50/ films" Q. Su, S. Z. Hua, and M. Wuttig. *Proceedings of SPIE - the International Society for Optical Engineering*, 2189, pp.409-412, (1994).
 39. "Effects of Microstructure on Photoluminescence of SrS:Eu²⁺,Sm³⁺ Thin Films", S. Z. Hua, L. Salamanca-Riba, M. Wuttig and P. K. Soltani, *Mater. Res. Symp. Proc.* pp.359-364 (1993).
 40. "Transformation Induced Stresses in SMA Thin Films", S. Z. Hua, C. M. Su, and M. Wuttig, *Mater. Res. Symp. Proc.* 308, (1993).
 41. "Magnetoresistance Measurements of Electrochemically Produced Cu/Ni Multilayers", D. S. Lashmore, Y. Zhang, S. Hua, M. P. Dariel, L. Swartzendruber and L. Salamanca-Riba, *Proc. Symp. Mag. Mat.: Processes and Devices*, New Orleans, Oct. (1993).
 42. "Trapping and Luminescence Mechanism Studies in SrS:Eu²⁺,Sm³⁺ Thin Films at Various Temperatures", S. Z. Hua, L. Salamanca-Riba, M. Wuttig, and P. K. Soltani, *Mater. Res. Soc. Symp. Proc.* 281, 597-602 (1992).
 43. "Damping and Interface Constraint in Martensitic NiTi Films," C. M. Su, S. Z. Hua, and M. Wuttig, in *Damping of Multiphase Inorganic Materials*, ed. R. B. Bhagat (ASM Proc.) pp. 165 (1992).

Grant Support

NSF/CMMI (PI - 80%), 09/01/15-08/31/20

Title: Force transduction mechanisms at adherens junctions.

Amount: \$430,000

NIH/NICHHD R21 (co-I - 10%), 09/01/16-08/31/19

Title: Protein stress in the development of C2C12 myotubes.

Amount: 437,355

NIH/NINDS R21 (PI - 80%), 09/01/13-08/31/2016

Title: Traumatic brain injury: early mechanosensitive events in astrocytes.

Amount: \$417,200

NSF/CBET (PI - 100%), 04/01/15-03/31/17

Title: EAGER: Calibration of novel FRET based force sensors *in vitro*.

Amount: \$99,890

NSF/CMMI (PI - 100%), 12/01/08-11/30/2013

Title: Sensor for Probing Intercellular Communications.

Amount: \$230,000

NIH/NIDDK K25 (PI - 100%), 03/01/07-02/28/2013

Title: Time resolved studies of transport in renal epithelial cells.

Amount: \$885,616

NIH/NIDDK ARRA Supplement (PI - 100%), 12/18/09-12/17/10

ARRA Supplement to "Time resolved studies of transport in renal epithelial cells".

Amount: \$53,040

NIH/NINDS R21 (PI – 50%), 09/01/08-08/31/2010

Title: Development of a device to measure gap junction physiology.

Amount: \$366,034

NSF/DMR (co-PI – 20%), 08/01/07-07/31/2012

Title: Structural effects on spin-polarized quantized conductance in atomic-sized magnetic contacts.

Amount: \$510,000

NSF/DMR (co-PI – 20%), 08/01/07-07/31/2012

Supplement to “Structural effects on spin-polarized quantized conductance in atomic-sized magnetic contacts”.

Amount: \$27,000

NSF/CMMI (PI - 100%), 07/01/05-06/30/2009

Title: Novel approach to microfluidic sensing and regulation for active flow control.

Amount: \$180,000

NIH/STTR with ALA Scientific Instruments (co-I - 50%), 07/01/05-06/30/2008

Title: Hydronic, High-Speed, Focal Thermal Stimulator.

Amount: \$224,900

New York State’s Empire State Development (NYSTAR) (co-I - 50%), 05/01/06-04/30/2008

Title: Develop and commercialize a microfluidics cell volume sensor.

Amount: \$750,000

NSF/CMS (PI - 100%), 07/16/02-07/15/2006

Title: A novel mechanism to make microfluidic components and systems requiring no mechanical moving parts.

Amount: \$190,000

NSF/DMR (co-PI - 25%), 05/01/03-04/30/2008

Title: FRG: Ballistic magnetoresistance in ferromagnetic nanocontacts magnetic contacts.

Amount: \$788,000

NSF/IMR (co-PI - 25%), 07/01/03 – 06/30/2004

Title: Acquisition of vibrating sample magnetometer for magnetic research and student education.

Amount: \$110,000

UB-IRCAF (PI - 80%), 03/01/03 – 02/28/2004

Title: Bubble based microfluidic chip.

Amount: \$50,000

Courses taught

Course Number Title: Years taught

MAE 487/587 Modern Theory of Materials: Spring’2013; Fall’ 2013 – 2018.

MAE 484/584 Nano/Microtechnologies for MEMS/bioMEMS: Spring’ 2006, 2014 – 2019.

MAE 385 Engineering Materials Laboratory: Spring’ 2005, 06 & 07.

MAE 513	Nano-scale Principles in Bio Applications: Fall' 2005.
MAE 581	Advanced Materials (substituted for 4 sections): Fall' 2005.
MAE 502	Individual Problems (various topics): 2002 – present.

Research Supervision

Postdoctoral Research Associate:

- Deepika Verma (PhD in Mechanical/Bioengineering) (10/15 – 1/16)
Project: Molecular force measurements using FRET probes.
- Nannan Ye (Ph.D. in Biochemistry) (04/09 - 02/13)
Project: Development of microfluidic strategy for single cell studies.
- Jinseok Heo (Ph.D. in Analytical Chemistry) (04/06 - 08/09)
Project: Studies of cell volume response to extracellular stimuli using microfluidic systems.
- Derek Beahm (Ph.D. in Biophysics) (07/07 - 10/07)
Project: Development of high throughput screening technology for gap junctions.

PhD Students:

- Tasnim Shireen, PhD (Expected: 09/21)
Project: Mechanical memory and long term effect of Traumatic Brain Injury (TBI).
- Mohammad Reza Bahrani Fard, PhD (Expected: 09/22)
Project: Force sensors for ECM mechanical properties during cell growth.
- Deekshitha Jetta, PhD (Expected: 09/19)
Project: Role of Piezo channels on flow sensing in epithelial cells.
- Kevin Suffoletto, PhD (Expected: 12/20)
Project: Effects of ECM patterning and substrate stiffness on collective cell migration.
- Mohammad Mehdi Maneshi, Ph.D. (completed: 08/17)
Dissertation: Traumatic Brain Injury: onset mechanical behavior of cells.
- Deepika Verma, Ph.D. (completed: 09/15)
Dissertation: Cytoskeletal stresses – Driving force for focal adhesion and adherens junction remodeling in epithelial cells under flow.
- Jason Rahimzadeh, Ph.D. (Completed: 01/13)
Dissertation: Contribution of cytoskeletal stresses to cell volume regulation.
- Cedric Bathany, Ph.D. (Completed: 05/12)
Dissertation: Microfluidic sensor for studying the intercellular communication via Gap Junctions.
- Jianbin Wang, Ph.D. (Completed: 09/10)
Dissertation: Developing microfluidic systems to study effect of fluid shear stress on epithelial cells.
- Daniel Ateya, Ph.D. (Completed, 11/05)
Dissertation: Impedance based sensing principles for microfluidic lab-on-a-chip systems.

Master Students:

- Bala Aadith Murugesan, M.S. (Expected: 8/2019)

Dan Kowalik, M.S. (completed: 05/14)
 Tom Pennell, M.S. (Completed: 03/08)
 Mark Huntington, M.S. Co-adviser (completed: 12/08)
 YaoLiang Wong, M.S. project (Completed: 05/07)
 Doug Boehm, M.S. (Completed: 08/06)
 Cedric Bathany, M.S. (completed: 12/06)
 Ganesh Balasubramanian, M.S. (completed: 12/03)
 Melanie Dewitt, M.S. (completed: 11/02)
 Brian Hohl, M.S. (Completed: 12/07)
 Yih-Uei Sheng, M.S. (Completed: 04/08)

Visiting students:

Rasmussen Mette, Ph.D. University of Copenhagen, Denmark (02/12-08/12)

Undergraduate Research Apprentices:

Katie Munechika	Fall' 19
Ana Reyes	Summer' 16
Joseph Groele	Spring' 14
Marie Catalano	Fall'10 - present
Kevin Suffoletto	Fall'07 - Summer'10
Jonathan Cohan	Summer, '07
Jason Rahimzadeh	Fall'06 - Summer '07
Ashish Shah	Fall '02 - Spring'05
Tom Pennell	Summer'05 – December'05
Dough Boehm	Spring '01-Fall '03
Mark Huntington (Co-advising)	Spring '05
Elizabeth Paoletti	Fall '05

Graduate Student Dissertation Committee Member

Mohammadnabi Asmani, PhD, BME, 12/2018	Zhaowei Chen, PhD, BME, 12/2018
Asma Eddib, PhD, 08/2018	Muhammad Saad Khan Tareen, MS, 07/2017
Wenyi Yang, MS, 01/2016	Naga Bharath Gundrati, MS, 01/2016
Rishab Gaba, MS, 01/2016	Digvijay Singh, MS, 01/2016
Yoshihiro Takizawa, PhD, 09/2015	Morteza Moalleminejad, MS, 01/2015
Ebrahim M. Kolahdouz, PhD, 11/2014	Xingtong He, PhD, 08/2014
Saman Seifi, MS, 08/2014	Ailipati Delixiati, M.S., 08/2014
Seungjin Han, PhD, 01/13	Sivapalan Baskaran, MS, 05/2012
Max Mandelbaum, PhD, 08/2011	Angela Poon, MS, 05/2011
Jillyn Allen, MS (Comprehensive Exam), 05/2011	Sankar Thiruvannamalai, M.S., 08/2010

Ho Joon Lee, MS, 08/2010	Hyun Heo, MS, 08/2010
David Meehan, MS, 5/2009	M. DiFranco, MS (Comprehensive Exam), 12/2008
J. Chen, MS, 08/2008	R. Panchapakesan, MS, 08/2007
J. Lin, MS 08/07	Ricky Chan, MS, 08/2006
S. Pirotta, M.S., 05/2005	S. Masoodi, Oral Comprehensive, 05/2005
P. Nagathan, M.S. 2004	J. Menezes, M.S. (project), 10/2004
G. Balasubramanian, M.S., 2003	M. Dewitt, M.S., 11/2002
W. Nieves, M.S., 06/2001	X. Yang, Ph.D., 12/2002
E. Holihan, M.S. (project), 06/2002	S. Chaturvedi, M.S. (project), 12/2003
K. P. Kankolenski, M.S., 11/2002	B. Shashishekar, M.S., 12/2002

Professional Services

Grant reviewer/panelist:

Reviewer/Panelist, NIH-EBIT study section, 2015
Reviewer/Panelist, NIH-SBIR/STTR-Bioengineering, 2011, 2012, 2013, 2014, 2016
Reviewer/Panelist, NSF-IRES, 2013, 2015, 2017
Reviewer/Panelist, NSF-CMMI, 2005, 2006, 2007, 2009, 2012
Reviewer, Biotechnology and Biological Sciences Research Council (BBSRC), UK, 2011
Reviewer, ACS Petroleum Research Fund, 2008
Reviewer/Panelist, NIH-Bioengineering, 2006
Reviewer/Panelist, NSF's Nanoscale Science and Engineering Center, site visit, 2006
Reviewer, Technology Foundation STW, Netherland, 2006
Reviewer/Panelist, NSF "Sensor Initiative", 2003, 2005
Reviewer, Nanotechnology Institute (NTI), 2005
Reviewer/Panelist, NSF-DMR, 2002, 2003
Reviewer/Panelist, NSF SBIR, 2002

Journal review:

Nature Scientific Reports	Langmuir
Nature protocol	PlosOne
Biophysical Journal	Biomicrofluidics
American J. of Physiology: cell physiology	Biomechanics and Mechanobiology
Analytical Chemistry	Cell Biochemistry and Biophysics
Journal of Biomechanics	Sensors Cell Transplantation
Annals of Biomedical Engineering	Journal of Applied Physics
Sensor & Actuators A (Physical)	Analyst
Sensor & Actuators B (Chemical)	Sensors and Materials

J. Microelectromechanical Systems	Colloids and Surfaces
J. Micromechanics and Microengineering	Biochimica et Biophysica Acta
Int'l J. Environmental Analytical Chemistry	IEEE Intermag.

University/Department Service

University/School service:

- Member, Presidential Review Board (PRB), 2016-present.
- Member, Search Committee for Director of BioXFEL Research Center, 2015-16.
- Member, Faculty Personal Committee, School of Engineering and Applied Science, 2008-2011.
- SEAS Freshmen Student Mentoring Program, 2005-2010.
- Review/panelist: UB proposals for the NSF-Major Research Instrumentation program, 2008.
- Review/panelist: UB2020 Interdisciplinary Research Development Fund, 2007.
- Faculty Search Committee, Department of Chemistry, under the umbrella of UB 2020 Integrated Nanostructured Systems (INS) strategic strength initiative, 2007.
- Involved in design of clean room facilities at UB's Bioinformatics Center, 2004-2005.

Department Service:

- Lead person, Faculty Search Committee (area of Materials), 2017.
- Member, Faculty Search Committee (area of design and advanced manufactory), 2016.
- Member, Faculty search committee (area of materials and mechanics), 2015.
- Member, Strategic Planning Committee (SPC), 2014-2016.
- Director, Graduate Studies Committee, 2008-2010.
- Member, Graduate Studies Committee, 2007-2014.
- Member, Faculty search committee in the area of Materials, 2005, 2011, 2014.
- Member, Faculty search committee in the area of multi-scale modeling, 2010.
- Member, Department chair search committee, 2008.
- Member, Faculty search committee, in the area of nanomaterials for energy, 2008.
- Member, Undergraduate Studies Committee, 2006-2007