

# Shizhi Qian

Associate Professor  
Institute of Micro/Nanotechnology  
Department of Mechanical and Aerospace Engineering  
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## Education

- 09/2002-12/2004     **Ph.D. in Mechanical Engineering and Applied Mechanics**  
Department of Mechanical Engineering and Applied Mechanics  
University of Pennsylvania, Philadelphia, PA
- Major area: Microfluidics and Nanofluidics (Lab-on-a-chip technology)
- 09/1994-10/1998     **Ph.D. in Engineering**  
Department of Thermal and Power Engineering  
Huazhong University of Science and Technology, Wuhan, China
- Major area: Gas-solid Two Phase Flow in a Fluidized Bed Boiler

## Work Experience

- 07/2011- Present     **Associate Professor**  
Department of Mechanical and Aerospace Engineering  
Old Dominion University
- 07/2008- 06/2011     **Assistant Professor**  
Department of Mechanical and Aerospace Engineering  
Old Dominion University

- 08/2005- 06/2008      **Assistant Professor**  
Department of Mechanical Engineering  
University of Nevada Las Vegas
- 01/2005- 07/2005      **Research Associate**  
Department of Mechanical Engineering and Applied Mechanics  
University of Pennsylvania, Philadelphia, PA
- 09/2002-12/2004      **Research Assistant**  
Department of Mechanical Engineering and Applied Mechanics  
University of Pennsylvania, Philadelphia, PA
- 01/2003-12/2004      **Teaching Assistant**  
Department of Mechanical Engineering and Applied Mechanics  
University of Pennsylvania, Philadelphia, PA
- 02/2001-08/2002      **Postdoctoral Research Fellow**  
Department of Mechanical Engineering and Applied Mechanics  
University of Pennsylvania, Philadelphia, PA  
▪ Supervisor: Professor Haim H. Bau
- 11/1998-08/2000      **Senior Engineer**  
Hwadar Elec. Co., Shenzhen, China

### **Research Interests**

- Micro- and Nano-scale Transport
- Electrokinetics
- Colloidal Science
- Microfluidics for point-of-care diagnostics

### **Funded Research Grants**

1. Post Doc Support, Subcontract from Yeungnam University Research Cooperation Foundation, South Korea, \$43,059, 1/2011-8/2012, **Shizhi Qian** (PI).
2. Seed Grant: Microfluidics-Immunology Project, ODU Office of Research, \$10,000, 1/2011-6/2011, Ali Beskok (PI) and **Shizhi Qian** (Co-PI).

3. A Multidisciplinary Approach to Nanoscale Measurement and Image Analysis of Patient Cartilage for Predicting Surgical Response, Office of Research's Multidisciplinary Grant, \$70,000, 1/2011-6/2011, Nikos Chrisochoides (PI), Ali Beskok, Andrey Chernikov, Shuiwang Ji, **Shizhi Qian**, Mike Stacey, Eric Dobratz, and Joe Han (Co-PIs).
4. Robust, Multifunctional, Bio-compatible Nanocapsules for Intraoperative Imaging and Other Biomedical Applications, Office of Research's Multidisciplinary Grant, \$56,572, 1/2011-6/2011, Balasubramanian Ramjee (PI), Khaled Sakhel, Chris Osgood, **Shizhi Qian**, R. James Swanson, David Gauthier, and James Lukban (Co-PIs).
5. Numerical and Experimental Study of Complex Bio-Fluids in Microfluidic Lab-on-a-Chip for Bio-Medical Applications, Office of Research's Multidisciplinary Grant, \$70,599, 1/2010-12/2010, Yan Peng (PI), Li-Shi Luo and **Shizhi Qian** (Co-PI)
6. A Learning Community for Engineers and Biologists at the Bio-Micro/Nano Interface, NSF, \$175,000, 1/2010-6/2012, **Shizhi Qian** (PI), Ali Beskok, David Gauthier, and Julie Hao (Co-PIs)
7. MRI: Acquisition of Four-Probe MultiView 4000 AFM, NSOM, and SPM System, NSF, \$310,401, 8/2009-7/2012, **Shizhi Qian** (PI), Ali Beskok, David Gauthier, Julie Hao, and Roland Cooper (Co-PIs)
8. Self-nano patterning of soft materials with bio applications, Ministry of Education, Science and technology of Korea World Class University (WCU) program, 3,500,000,000 Wons (Dr. Qian's share: Year 1, 296,775,000 KRW, Year 2, 229,600,000 KRW, Year 3, 256,869,999 KRW, Years 4 and 5: unknown), 4/2009-10/2013, Sang-W. Joo (PI), Ashutosh Sharma and **Shizhi Qian** (Co-PIs).
9. Novel Nano-porous electroosmotic micropump: basic technology development and its lab-on-a-chip applications, Office of Research's Multidisciplinary Grant, \$70,000, 1/2008-6/2008, **Shizhi Qian** (PI), Helmut Baumgart and Ali Beskok (Co-PIs)
10. Impaired insulin delivery during continuous insulin infusion, Office of Research's Multidisciplinary Grant, \$77,650, 1/2008-6/2008, Ayodeji Demuren (PI), **Shizhi Qian** and Noru Diawara (Co-PIs)
11. Investigation of Nano-modified Concrete Properties, UNLV President Research Award, \$50,000, 5/2008-4/2010, Aly M. Said (PI), **Shizhi Qian** and Ying Tian (Co-PIs)

12. Build a Mobile Vehicle for In-situ Measurement of Dust of UFP and PM1, US DEPT OF TRANS/TRC, \$117,519, 9/2007-12/2009, **Shizhi Qian** (PI), Harry Teng (Co-PI)
13. Development of Carbon Nanotube Pipettes (CNPs) for Single Cell Surgery in Nanomedicine Era, UNLV President Research Award, \$50,000, 6/2007-5/2009, **Shizhi Qian** (PI), Yingtao Jiang, Biswajit Das, Marcos A. Cheney, Deborah Keil (Co-PIs)
14. Microbial Fuel Cell-Convert Waste into Energy, UNLV President Research Award, \$11,197, 6/2007-5/2009, Jian Ma (PI), **Shizhi Qian**, Yingtao Jiang and Henry Sun(Co-PIs)
15. Development of RedOx Magneto-hydrodynamic-Based Closed Loop Liquid Chromatography, UNLV New Investigator Award, \$15,000, 2/2007-1/2009, **Shizhi Qian** (PI)
16. Rational Design of Highly Sensitive Mercury Sensors Based on Fluorescence Switch-on and Their Microfluidic System for In-Situ Detection, NSF EPSCoR Ring True III, \$75,000, 9/2006-5/2008, Dong-Chan Lee (PI) and **Shizhi Qian** (Co-PI)
17. Development of a Magneto-Hydro-Dynamic (MHD)- Based Microfluidic System for the Detection of Mercury in Water, NSF EPSCoR, \$79,688, 1/2006-12/2007, **Shizhi Qian** (PI)
18. Detection of Chemical Explosives in Water Using Magneto-Hydrodynamic-Based Microfluidic Systems, NSF EPSCoR, \$17,383, 1/2006-7/2006, **Shizhi Qian** (PI) and Ming Ye (Co-PI)

## **Publications**

### **Book**

B1. **Qian S.** and Ai Y., Electrokinetic Particle Transport in Micro/Nano-Fluidics: Direct Numerical Simulation Analysis. CRC Press Taylor & Francis, 2012. ISBN: 9781439854389.

### **Book Chapters**

*(NOTE: The plus designation—Qian S.<sup>+</sup>-- indicates that Dr. Qian is the corresponding author)*

- BC1. Ai Y. and **Qian S.**, Field effect control of ion, fluid, and particle transport in micro/nanofluidics, In “Encyclopedia of Surface and Colloid Science” edited by P. Somasundaran, Taylor & Francis, New York, 2012
- BC2. **Qian S.**, Qin M., and Bau H.H., Applications of magnetohydrodynamics in microfluidics, In “Microfluidics and Nanofluidics Handbook” edited by S. K. Mitra and S. Chakraborty, CRC Press Taylor Francis, 2011
- BC3. **Qian S.**, Celik B., and Beskok A., Characterization of chaotic stirring and mixing in lab on a chip devices using numerical tools, In “Microfluidics and Nanofluidics Handbook” edited by S. K. Mitra and S. Chakraborty, CRC Press Taylor Francis, 2011
- BC4. **Qian S.**<sup>+</sup> and Duval J.F.L., Chemical and biological systems: mixers. In “Comprehensive Microsystems” edited by Gianchandani Y.B., Tabata O., and Zappe H., Volume 2, pp.323-374, Elsevier, London, ISBN 0444521941 / 9780444521941, 2007
- BC5. **Qian S.**<sup>+</sup> and Das B., Ion-current rectification in conical nanopores: effects of electroosmotic flow. In “Surface Electrical Phenomena in Membranes and Microchannels” edited by Szymczyk A., pp233-253, Transworld Research Network, Kerala, India, ISBN 978-81-7895-326-7, 2008

**Journal Articles Since 2002**

- J1. Yeh L-H., Hsu J-P., **Qian S.**<sup>+</sup>, and Tseng S., Counterion Condensation in pH-Regulated Polyelectrolytes, *Journal of Physical Chemistry Letters*, 2012 (under review)
- J2. Sabuncu A.C., Grubbs J., **Qian S.**, Abdel-Fattah T.M., Stacey M.W., Beskok A., Probing nanoparticle interactions in cell culture media, *Colloids and Surfaces B: Biointerfaces*, 2012 (under review)
- J3. Zhao L., Yang J., Hu N., Joo S.W., **Qian S.**<sup>+</sup>, A Microfluidic Chip for Bacteria Sterilization by Pulsed Electric Field, *Electrophoresis*, 2012 (under review)
- J4. Yeh L-H., Zhang M., **Qian S.**<sup>+</sup>, Hsu J-P., Regulating DNA Translocation through Functionalized Soft Nanopores, *Nanoscale*, 2012 (under review)
- J5. Zhang M., Yeh L-H., **Qian S.**<sup>+</sup>, Hsu J-P., Joo S.W., DNA electrokinetic translocation through a nanopore: local permittivity environment effect, *Journal of Physical Chemistry C*, 2012 (Accepted)

- J6. Yeh L-H., Xue S., Joo S.W., **Qian S.**<sup>+</sup>, Hsu J-P., Field effect control of surface charge property and electroosmotic flow in nanofluidics, *Journal of Physical Chemistry C*, 2012 (Accepted)
- J7. Hu N., Yang J., **Qian S.**, Zhang X., Joo S.W., Zheng X., A cell electrofusion microfluidic chip using discrete co-planar vertical sidewall microelectrodes, *Electrophoresis*, 2012 (Accepted)
- J8. Ray B., Reddy D.S., Bandyopadhyay D., Joo S.W., Sharma A., **Qian S.**, Biswas G., Instabilities in free-surface electroosmotic flows, *Theoretical and Computational Fluid Dynamics*, 26, 311-318, 2012.
- J9. Hu N., Ai Y., and **Qian S.**<sup>+</sup>, Field effect control of electrokinetic transport in micro/nanofluidics, *Sensors and Actuators B: Chemical*, 161, 1150-1167, 2012.
- J10. Bandyopadhyay D., Reddy D.S., Sharma A., Joo S.W., and **Qian S.**, New electro-magnetic field induced flow and instabilities in confined stratified liquid layers, *Theoretical and Computational Fluid Dynamics*, 26, 23-28, 2012
- J11. Xue S., Hu N., and **Qian S.**<sup>+</sup>, Tuning surface charge property by floating gate field effect transistor, *Journal of Colloid and Interface Science*, 365, 326-328, 2012.
- J12. Zhang B., Ai Y., Liu J., Joo S.W., and **Qian S.**<sup>+</sup>, Polarization effect of dielectric membrane on the ionic current rectification in a conical nanopore, *Journal of Physical Chemistry C*, 115, 24951-24959, 2011.
- J13. Ray B., Reddy D.S., Bandyopadhyay D., Joo S.W., Sharma A., **Qian S.**, Biswas G., Surface instability of a thin electrolyte film undergoing coupled electroosmotic and electrophoretic flows in a microfluidic channel, *Electrophoresis*, 32, 3257-3267, 2011.
- J14. Hu N., Yang J., Yin Z., Ai Y., **Qian S.**<sup>+</sup>, Svir I., Xia B., Yan J., Hou W., Zheng X., A high-throughput Dielectrophoresis-based cell electrofusion microfluidic device, *Electrophoresis*, 32, 2488-2495, 2011.
- J15. Banerjee A.N., **Qian S.**, and Joo S.W., High speed droplet actuation on single-plate electrode array, *Journal of Colloid and Interface Science*, 362, 567-574, 2011.
- J16. Ai Y., Benjamin M., Sharma A., and **Qian S.**<sup>+</sup>, Electrokinetic motion of a deformable particle: dielectrophoretic effect, *Electrophoresis*, 32, 2282-2291, 2011.

- J17. Zhang M., Ai Y., Kim D-S., Jeong J-H., Joo S.W., and **Qian S.**<sup>+</sup>, Electrophoretic motion of a soft spherical particle in a nanopore, *Colloids and Surfaces B: Biointerfaces*, 88, 165-174, 2011.
- J18. Hu N., Yang J., **Qian S.**, Joo S.W., and Zheng X., A cell electrofusion microfluidic device integrated with 3D thin-film microelectrode arrays, *Biomicrofluidics*, 5, 034121, 2011.
- J19. Zhang M., Ai Y., Sharma A., Joo S.W., Kim D-S., and **Qian S.**<sup>+</sup>, Electrokinetic particle translocation through a nanopore containing a floating electrode, *Electrophoresis*, 32, 1864-1874, 2011.
- J20. Zhuang Y., Hou W., Zheng X., Wang Z., Zheng J., Pi X., Cui J., Jiang Y., **Qian S.**<sup>+</sup>, Peng C., A MEMS-based electronic capsule for time controlled drug delivery in the alimentary canal, *Sensors and Actuators A: Physical*, 169, 211-216, 2011.
- J21. Ai Y., Liu J., Zhang B., and **Qian S.**<sup>+</sup>, Ionic current rectification in a conical nanofluidic field effect transistor, *Sensors and Actuators B: Chemical*, 157, 742-751, 2011.
- J22. Ai Y. and **Qian S.**<sup>+</sup>, Direct numerical simulation of electrokinetic translocation of a cylindrical particle through a nanopore using a Poisson-Boltzmann approach, *Electrophoresis*, 32, 996-1005, 2011
- J23. Choi W., Sharma A., **Qian S.**, Lim G., and Joo S.W., On steady two-fluid electroosmotic flow with full interfacial electrostatics, *Journal of Colloid and Interface Science*, 357, 521-526, 2011.
- J24. Reddy D.S., Bandyopadhyay D., Joo S.W., Sharma A., **Qian S.**, A parametric study on instabilities in a two-layer magneto-hydrodynamic channel flow confined between two parallel electrodes, *Physical Review E*, 83, 036313, 2011.
- J25. Joo S.W. and **Qian S.**<sup>+</sup>, Electrophoretic motion of a nanorod along the axis of a nanopore under a salt gradient, *Journal of Colloid and Interface Science*, 356, 331-340, 2011.
- J26. Banerjee A.N., **Qian S.**, and Joo S.W., Large field enhancement at electrochemically grown quasi-1D Ni nanostructures with low-threshold cold field electron emission, *Nanotechnology*, 22, 035702, 2011
- J27. Ai Y. and **Qian S.**<sup>+</sup>, Electrokinetic particle translocation through a nanopore, *Physical Chemistry Chemical Physics*, 13, 4060-4071, 2011

- J28. Yalcin S.E., Sharma A., **Qian S.**<sup>+</sup>, Joo S.W., Baysal O., On-demand particle enrichment in a microfluidic channel by a locally controlled floating electrode, *Sensors and Actuators B: Chemical*, 153, 277-283, 2011.
- J29. Ai Y., Liu J., Zhang B., and **Qian S.**<sup>+</sup>, Field effect regulation of DNA translocation through a nanopore, *Analytical Chemistry*, 82, 8217-8225, 2010.
- J30. Yalcin S.E., Sharma A., **Qian S.**<sup>+</sup>, Joo S.W., Baysal O., Manipulating particles in microfluidics by floating electrodes, *Electrophoresis*, 31, 3711-3718, 2010.
- J31. Ai Y., Yalcin S.E., Gu D., Baysal O., Baumgart H., **Qian S.**, and Beskok A., A low-voltage nano-porous electroosmotic pump, *Journal of Colloid and Interface Science*, 350, 465-470, 2010.
- J32. Joo S.W., Lee S.Y., Jing Liu, and **Qian S.**<sup>+</sup>, Diffusiophoresis of an elongated cylindrical nanoparticle along the axis of a nanopore, *ChemPhysChem*, 11, 3281-3290, 2010.
- J33. Liang L., **Qian S.**, and Xuan X., Three-dimensional electrokinetic focusing of particles in a rectangular microchannel, *Journal of Colloid and Interface Science*, 350, 377-379, 2010.
- J34. Ai Y. and **Qian S.**<sup>+</sup>, DC dielectrophoretic particle-particle interactions and their relative motions, *Journal of Colloid and Interface Science*, 346, 448-454, 2010. (**Cover page article**)
- J35. Liang L., Ai Y., Zhu J., **Qian S.**, and Xuan X., Wall-induced lateral migration in particle electrophoresis through a straight microchannel, *Journal of Colloid and Interface Science*, 347, 142-146, 2010. (**Cover page article**)
- J36. Yalcin S.E., Lee S.Y., Joo S.W., Baysal O., and **Qian S.**<sup>+</sup>, Electrodiffusiophoretic motion of a charged spherical particle in a nanopore, *Journal of Physical Chemistry B*, 114, 4082-4093, 2010.
- J37. Choi W.S., Sharma A., **Qian S.**, Lim G., and Joo S.W., Are free surfaces free in micro-scale electrokinetic flows? *Journal of Colloid and Interface Science*, 347, 153-155, 2010.
- J38. Lee S.Y., Yalcin S.E., Joo S.W., Baysal O., and **Qian S.**<sup>+</sup>, Diffusiophoretic motion of a charged spherical particle in a nanopore, *Journal of Physical Chemistry B*, 114, 6437-6446, 2010.
- J39. Lee S.Y., Yalcin S.E., Joo S.W., Sharma A., Baysal O., and **Qian S.**<sup>+</sup>, The effect of axial concentration gradient on electrophoretic motion of a charged spherical particle in a nanopore, *Microgravity-Science and Technology*, 22, 329-338, 2010.



- J40. Bandyopadhyay D., Sharma A., Joo S.W., and **Qian S.**, Self-organized micropatterning of thin viscous bilayers under microgravity, *Microgravity-Science and Technology*, 22, 273-282, 2010.
- J41. Subuncu A.C., Kalluri B.S., **Qian S.**, Stacey M.W., and Beskok A., Dispersion state and toxicity of mWCNTs in cell culture medium with different T80 concentrations, *Colloids and Surfaces B: Biointerfaces*, 78, 36-43, 2010.
- J42. Ai Y., Zhang M., Joo S.W., Cheney M.A., and **Qian S.**<sup>+</sup>, Effects of electroosmotic flow on ionic current rectification in conical nanopores, *Journal of Physical Chemistry C*, 114, 3883-3890, 2010.
- J43. Ai Y., Park S., Zhu J., Xuan X., Beskok A., and **Qian S.**<sup>+</sup>, DC electrokinetic particle transport in an L-shaped microchannel, *Langmuir*, 26(4), 2937-2944, 2010.
- J44. Ai Y., **Qian S.**, Liu S., and Joo S.W., Dielectrophoretic choking phenomenon in a converging-diverging microchannel, *Biomicrofluidics*, 4, 013201, 2010. Selected paper in *Virtual Journal of Biological Physics Research*, 19(2), 2010.
- J45. Panta Y.M., Farmer D.E., Johnson P., Cheney M.A., **Qian S.**<sup>+</sup>, Preparation of alpha sources using magneto-hydrodynamic electrodeposition for radionuclide metrology, *Journal of Colloid and Interface Science*, 342, 128-134, 2010.
- J46. Duval J.F.L. and **Qian S.**, Metal speciation dynamics in dispersion of soft colloidal ligand particles under steady-state laminar flow condition, *Journal of Physical Chemistry A*, 113, 12791-12804, 2009.
- J47. Ai Y., Beskok A., Gauthier D.T., Joo S.W., and **Qian S.**<sup>+</sup>, DC electrokinetic transport of cylindrical cells in straight microchannels, *Biomicrofluidics*, 3, 044110, 2009. Selected paper in *Virtual Journal of Biological Physics Research*, 18(11), 2009.
- J48. Hou W.S., Wu X.Y., Zheng J., Ma L., Zheng X.L., Jiang Y.T., Yang D.D., **Qian S.**, Peng C.L., Characterization of finger isometric force production with maximum power of surface electromyography, *Biomedical Engineering-Applications Basis Communications*, 21, 193-199, 2009.
- J49. Ai Y., Joo S.W., Jiang Y., Xuan X., and **Qian S.**<sup>+</sup>, Transient electrophoretic motion of a charged particle through a converging-diverging microchannel: effect of direct current – dielectrophoretic force, *Electrophoresis*, 30, 2499-2506, 2009.

- J50. Cheney M.A., Jose R., Banerjee A., Bhowmik P.K., **Qian S.**<sup>+</sup>, and Okoh J.M., Synthesis and Characterization of Birnessite and Cryptomelane Nanostructures in Presence of Hoffmeister Anions, *Journal of Nanomaterials*, doi:10.1155/2009/940462, 2009.
- J51. Ai Y., Joo S.W., Jiang Y., Xuan X., and **Qian S.**<sup>+</sup>, Pressure-driven transport of particles through a converging-diverging microchannel, *BioMicrofluidics*, 3, 022404, 2009. Selected paper in *Virtual Journal of Biological Physics Research*, 17(9), 2009.
- J52. Panta Y. M., Liu J., Cheney M.A., Joo S.W., and **Qian S.**<sup>+</sup>, Ultra-sensitive detection of mercury (II) ions using electrochemical surface plasmon resonance with magnetohydrodynamic convection, , *Journal of Colloid and Interface Science*, 333, 485-490, 2009.
- J53. **Qian S.**<sup>+</sup>, Joo S.W., Ai Y., Cheney M.A., and Hou W., The effect of linear surface-charge non-uniformities on the ionic-current Rectification in conical nanopores, *Journal of Colloid and Interface Science*, 329, 376-383, 2009.
- J54. Cheney M.A., Liu J., Amei A., Zhao X., Joo S.W., **Qian S.**<sup>+</sup>, A comparative study on the uptake of polycyclic aromatic hydrocarbons by *Anodonta Californienis*, *Environmental Pollution*, 157, 601-608, 2009.
- J55. **Qian S.**, Joo S.W., Jiang Y., and Cheney M.A., Free-surface problems in electrokinetic micro- and nanofluidics, *Mechanics Research Communications*, 36, 82-91, 2009.
- J56. **Qian S.** and Bau H.H., Magnetohydrodynamics-based Microfluidics, *Mechanics Research Communications*, 36, 10-21, 2009.
- J57. Cheney M.A., Bhowmik P.K., **Qian S.**<sup>+</sup>, Joo S.W., Hou W., and Okoh J.M., A new method of synthesizing black birnessite nanoparticles: from brown to black birnessite with nanostructures, *Journal of Nanomaterials*, doi:10.1155/2008/763706, 2008.
- J58. Pant Y.M., **Qian S.**, Cross C.L., and Cizdziel J.V., Mercury content of tobacco products by means of automated combustion amalgamation atomic absorption spectrometry, *Journal of Analytical and Applied Pyrolysis*, 83, 7-11, 2008.
- J59. Cheney M.A., Bhowmik P.K., Moriuchi S., Villalobos M., **Qian S.**, and Joo S.W., The effect of stirring on the morphology of birnessite nanoparticles, *Journal of Nanomaterials*, doi:10.1155/2008/168716, 2008.

- J60. Kabbani H., Marc M., Joo S.W., and **Qian S.**<sup>+</sup>, Analytical prediction of flow field in magnetohydrodynamic-based microfluidic devices, *Journal of Fluids Engineering*, 130, 091204, 2008.
- J61. **Qian S.**<sup>+</sup>, Joo S.W., Hou W., and Zhao X., Electrophoretic motion of a spherical particle with a symmetric non-uniform surface charge distribution in a nanotube, *Langmuir*, 24, 5332-5340, 2008.
- J62. **Qian S.**<sup>+</sup> and Joo S.W., An analysis of the self-electrophoretic motion of a spherical particle in a nanotube: Effect of nonuniform surface charge density, *Langmuir*, 24, 4778-4784, 2008.
- J63. Cheney M.A., Keil D., and **Qian S.**, Uptake and Effect of Mercury on Amino Acid Losses from the Grills of the Bivalve Mollusks *Mytilus californianus* and *Anodonta californiensis*, *Journal of Colloid and Interface Science*, 320, 369-375, 2008.
- J64. Panta Y.M., **Qian S.**<sup>+</sup>, and Cheney M.A., Stripping Analysis of Mercury (II) Ionic Solutions under Magnetohydrodynamic Convection, *Journal of Colloid and Interface Science*, 317, 175-182, 2008.
- J65. **Qian S.**<sup>+</sup>, Das B., and Luo X., Diffusioosmotic Flows in Slit Nanochannels, *Journal of Colloid and Interface Science*, 315, 721-730, 2007.
- J66. Kabbani H., Wang A., Luo X., and **Qian S.**<sup>+</sup>, Modeling RedOx-based Magnetohydrodynamics in Three-dimensional Microfluidic Channels, *Physics of Fluids*, 19, 083604, 2007. Selected paper in *Virtual Journal of Nanoscale Science & Technology*, 16(11), 2007.
- J67. Liu H., **Qian S.**, and Bau H.H., The Effect of Translocating Cylindrical Particles on the Ionic Current through a Nano-Pore, *Biophysical Journal*, 92, 1164-1177, 2007.
- J68. **Qian S.**<sup>+</sup>, Wang A., and Afonien J.K., Electrophoretic motion of a spherical particle in a converging-diverging nanotube, *Journal of Colloid and Interface Science*, 303, 579-592, 2006.
- J69. **Qian S.**, Chen Z., Wang J., and Bau H.H., Electrochemical reaction with RedOx electrolyte in toroidal conduits in the presence of natural convection, *International Journal of Heat and Mass Transfer*, 49, 3968-3976, 2006
- J70. **Qian S.**<sup>+</sup> and Duval J.F.L., Modulation of electroosmotic flows in electron-conducting microchannels by coupled quasi-reversible faradaic and adsorption-mediated depolarization, *Journal of Colloid and Interface Science*, 300, 413-428, 2006

- J71. **Qian S.**<sup>+</sup> and Duval J.F.L., Coupling between electroosmotically driven flow and bipolar faradaic depolarization processes in electron-conducting microchannels, *Journal of Colloid and Interface Science*, 297, 341-352, 2006
- J72. Chen Z., Wang J., **Qian S.**, and Bau H.H. Thermally-Actuated, Phase-Change Flow Control for Microfluidic Systems, *Lab on a Chip*, 5, 1277-1285, 2005
- J73. Kim B.M., **Qian S.**, and Bau H.H., Filling Carbon Nanotubes with Particles, *Nano Letters*, 5(5), 873-878, 2005
- J74. **Qian S.** and Bau H.H., Magneto-Hydrodynamic Flow of RedOx Electrolyte, *Physics of Fluids*, 17, 067105, 2005
- J75. **Qian S.**, Bürger R., and Bau H.H., Analysis of Sedimentation Bio-detectors, *Chemical Engineering Science*, 60(6), 2585-2598, 2005
- J76. **Qian S.** and Bau H.H., Theoretical Investigation of Electroosmotic Flows and Chaotic Stirring in Rectangular Cavities, *Applied Mathematical Modelling*, 29, 726-753, 2005
- J77. **Qian S.** and Bau H.H., Magnetohydrodynamic Stirrer for Stationary and Moving Fluids, *Sensors and Actuators B: Chemical*, 10(2), 859-870, 2005
- J78. Chen Z., **Qian S.**, Abrams W.R., Malamud D., and Bau H.H., Thermosyphon-based PCR Reactor: Experiment and Modeling, *Analytical Chemistry*, 76, 3707-3715, 2004
- J79. **Qian S.** and Bau H.H., Analysis of Lateral Flow Bio-detector: Competitive Assay, *Analytical Biochemistry*, 326(2), 211-224, 2004
- J80. **Qian S.** and Bau H.H., A Mathematical Model of Lateral Flow Bio-reactions Applied to Sandwich Assays, *Analytical Biochemistry*, 322 (1), 89-98, 2003
- J81. Bau H.H., Zhu J.Z., **Qian S.**, and Xiang Y., A Magneto-hydrodynamically Controlled Fluidic Network, *Sensors and Actuators B: Chemical*, 88, 205-216, 2003
- J82. **Qian S.** and Bau H.H., A Chaotic Electroosmotic Stirrer, *Analytical Chemistry*, 74, 3616-3625, 2002
- J83. **Qian S.**, Zhu J.Z., and Bau H.H., A Stirrer for Magnetohydrodynamically Controlled Minute Fluidic Networks, *Physics of Fluids*, 14 (10), 3584-3592, 2002
- J84. Yi M.Q., **Qian S.**, and Bau H.H., A Magnetohydrodynamic Chaotic Stirrer, *Journal of Fluid Mechanics*, 468, 153-177, 2002

**Conference Proceedings Since 2002**

- C1. Hu N., Qian S., and Joo S.W., High Throughput Cell Electrofusion Microfluidic Chip with Sidewall Microelectrode Arrays, Nanotech Conference & Expo 2012, Santa Clara, CA, June 18-21, 2012.
- C2. Yeh L-H., Hsu J-P., and **Qian S.**, Ionic Polarization Effect on the Electrophoretic Behavior of Polyelectrolytes. The ASME 10<sup>th</sup> International Conference on Nanochannels, Microchannels, and Minichannels Conference, Puerto Rico, USA, July 8-12, 2012.
- C3. Yang J., Hu N., and **Qian S.**, A microfluidic chip for sterilization of bacterization using pulsed electric fields, The 28<sup>th</sup> Annual Meeting of the American Electrophoresis Society, Minneapolis, MN, USA, October 16-21, 2011.
- C4. Hu N., Joo S.W., Yang J., **Qian S.**, and Zheng X., A 3D bulk microelectrode array for high throughput cell electrofusion, The 28<sup>th</sup> Annual Meeting of the American Electrophoresis Society, Minneapolis, MN, USA, October 16-21, 2011.
- C5. Ai Y., Joo S.W., and **Qian S.**, Field effect control of DNA nanoparticle electrokinetic translocation through a nanopore, The 28<sup>th</sup> Annual Meeting of the American Electrophoresis Society, Minneapolis, MN, USA, October 16-21, 2011.
- C6. **Qian S.** and Joo S.W., Magneto-hydrodynamic flows in microfluidics, The 4<sup>th</sup> International Conference on Magneto-Science (ICMS2011), Shanghai & Xi'an, China, October 9-15, 2011.
- C7. **Qian S.** and Joo S.W., Magneto-hydrodynamic electrodeposition of radioactive sources, The 4<sup>th</sup> International Conference on Magneto-Science (ICMS2011), Shanghai & Xi'an, China, October 9-15, 2011.
- C8. Cheney M. and **Qian S.**, Ultra-sensitive detection and effect of Hg(II) on cell membranes, The 42<sup>nd</sup> Middle Atlantic Regional Meeting (MARM 2011) of the ACS, College Park, Maryland, USA, May 21-24, 2011.
- C9. **Qian S.**, Gauthier D., Beskok A., Hao J.Z., and Adcock A., A learning community for engineers and biologists at the bio-micro/nano interface, The 2011 CCLI/TUES Principal Investigators (PIs) Conference, Washington, D.C., USA, January 26-28, 2011.
- C10. Liang L., **Qian S.**, and Xuan X., Lateral migration and three-dimensional focusing of particles in microchannel electrophoresis, The 63<sup>rd</sup> Annual meeting of the APS division of fluid dynamics, Long Beach, CA, USA, Nov. 21-23, 2010.

- C11. Gu D., Yalcin S.E., Baumgart H., **Qian S.**, Baysal O., and Beskok A., Electrophoretic light scattering for surface zeta potential measurement of ALD metal oxide films, The 218<sup>th</sup> ECS meeting, Las Vegas, NV, USA, October 10-15, 2010.
- C12. Lee S.Y., Yalcin S.E., Joo S.W., Sharma A., Baysal O., and **Qian S.**, The effect of axial concentration gradient on electrophoretic motion of a charged spherical particle in a nanopore, The 5<sup>th</sup> International Topical Team Workshop on TWO-PHASE SYSTEMS FOR GROUND AND SPACE APPLICATIONS, Kyoto, Japan, September 26-29, 2010.
- C13. Ai Y. and **Qian S.**, Regulation of DNA translocation through a nanopore by a fluidic field effect transistor. The 17th International Symposium on Capillary Electroseparation Techniques, Baltimore, Maryland, USA, August 29-September 1, 2010.
- C14. Banerjee A.N., Chattopadhyay K.K., **Qian S.**, and Joo S.W., Size-dependent optical properties of p-type semiconducting transparent copper aluminum oxide nanoparticles for transparent electronic applications, the 4<sup>th</sup> International Meeting on Developments in Materials, Processes and Applications of Engineering Technologies (MPA 2010), Braga, Portugal, July 28-30, 2010.
- C15. Banerjee A.N., **Qian S.**, and Joo S.W., FESEM imaging and field-emission characterization of densely packed vertically aligned nickel nanopillars synthesized by electrodeposition process on metal-coated Si substrate, the 4<sup>th</sup> International Meeting on Developments in Materials, Processes and Applications of Engineering Technologies (MPA 2010), Braga, Portugal, July 28-30, 2010.
- C16. Bakirci M., Ai Y. and **Qian S.**, Ionic current rectification in a conical nanopore under asymmetric electrolyte concentration, the 7<sup>th</sup> International Bioelectrics Symposium, Norfolk, VA, USA, June 24-26, 2010.
- C17. Kalluri B.S., Basu G., Sabuncu A.C., Osgood C.J., Beskok A., **Qian S.**, Stacey M.W., Enhancing the killing effect of nsPEFs using Tween 80, the 7<sup>th</sup> International Bioelectrics Symposium, Norfolk, VA, USA, June 24-26, 2010.
- C18. Ai Y. and **Qian S.**, DNA nanoparticle translocation through a nanopore, the 7<sup>th</sup> International Bioelectrics Symposium, Norfolk, VA, USA, June 24-26, 2010.
- C19. Ai Y. and **Qian S.**, Dielectrophoretic particle-particle interactions, the 16<sup>th</sup> US National Congress of Theoretical and Applied Mechanics, June 27-July 2, 2010, State College, Pennsylvania, USA.

- C20. Ai Y., Joo S.W., Liu S., and **Qian S.**, Direct numerical simulation of particle separation by direct current dielectrophoresis, ASME 2009 Micro/Nanoscale Heat and Mass Transfer International Conference, December 18-21, 2009, Shanghai, China
- C21. Ai Y., Beskok A., **Qian S.**, and Joo S.W., DC electrokinetic transport of a cylindrical particle in a straight microchannel, The 62<sup>nd</sup> annual meeting of the APS division of fluid dynamics, November 22-24, 2009, Minneapolis, MN, USA.
- C22. Ai Y., Park S., Zhu J., Xuan X., Beskok A., Joo S.W., and **Qian S.**, Transient electrophoretic motion of charged particles through an L-shaped microchannel, Proceedings of IMECE 2009, November 13-19, Lake Buena Vista, Florida, USA.
- C23. Gu D., Yalcin S.E., Baumgart H., **Qian S.**, Baysal O., and Beskok A., Zeta potentials of ALD metal oxide films for microfluidic applications, The AVS Topical Conference on Atomic Layer Deposition (ALD 2009), July 19-22, 2009, Monterey, California, USA.
- C24. Sabuncu A.C., Kalluri B.S., Cao W., Stacey M.W., **Qian S.**, Beskok A. and Abdel-Fattah T.M., Electrokinetic Properties of Colloidal Carbon Nanotubes, The 13th International Conference on Surface & Colloid Science and the 83rd ACS Colloid & Surface Science Symposium, June 14-19, 2009, New York, USA.
- C25. Ai Y., Joo S.W., Beskok A., and **Qian S.**, Dielectrophoretic choking phenomenon in a converging-diverging channel, the 13th International Conference on Surface & Colloid Science and the 83rd ACS Colloid & Surface Science Symposium, June 14-19, 2009, New York, USA.
- C26. Joo S.W. and **Qian S.**, Instabilities and critical phenomena in free-surface electroosmotic flows, the 13th International Conference on Surface & Colloid Science and the 83rd ACS Colloid & Surface Science Symposium, June 14-19, 2009, New York, USA.
- C27. Ai Y., Joo S.W., Beskok A., and **Qian S.**, Electrophoretic motion of charged particles in microfluidic devices with non-uniform electric fields, Gordon Research Conferences on the Physics and Chemistry of Microfluidics, June 28-July 3, 2009, Lucca (Barga), Italy
- C28. Cheney M.A., Jose R., Banerjee A., Bhowmik P.K., **Qian S.**, and Joo S.W., Role of process conditions on the controlled conversion of nanoplates to nanoneedles in birnessite without structural change, The 237<sup>th</sup> ACS National Meeting & Exposition, March 22-26, 2009, Salt Lake City, UT, USA

- C29. Cheney M.A., Jose R., Banerjee A., Bhowmik P.K., and **Qian S.**, Effect of Hoffmeister anions on nanostructure of cryptomelane MnO<sub>2</sub> and its transformation to birnessite phase, The 237<sup>th</sup> ACS National Meeting & Exposition, March 22-26, 2009, Salt Lake City, UT, USA
- C30. Cheney M.A., Bhowmik P.K., **Qian S.**, Joo S.W., Hou W., Okoh J.M., Novel synthesis of layer-structured black birnessite nanomaterial from brown birnessite with complex shape under mild and acidic conditions, The 237<sup>th</sup> ACS National Meeting & Exposition, March 22-26, 2009, Salt Lake City, UT, USA
- C31. Panta Y.M., Kim H.W., and **Qian S.**, Microfluidic channels under magnetohydrodynamic (MHD) convection, 2009 APS March meeting, March 16-20, 2009, Pittsburgh, Pennsylvania, USA.
- C32. Panta Y.M., Farmer D.E., Cheney M.A., **Qian S.**, Electrodeposition of Radionuclides Under Magnetohydrodynamic Convection for Alpha Spectrometric Determination, The 42<sup>nd</sup> ACS WRM, September 23-27, 2008, Las Vegas, USA.
- C33. Panta Y.M., **Qian S.**, Cizdziel J.V., Cross C.L., Mercury Content of Tobacco Products by Means of Automated Combustion Amalgamation Atomic Absorption Spectrometry, The 42<sup>nd</sup> ACS WRM, September 23-27, 2008, Las Vegas, USA.
- C34. Panta Y.M., **Qian S.**, Cheney M.A., Electrochemical Detection of Mercury Under Magnetohydrodynamic (MHD) Convection, The 42<sup>nd</sup> ACS WRM, September 23-27, 2008, Las Vegas, USA.
- C35. Panta Y.M., Liu J., **Qian S.**, Cheney M.A., Joo S.W., Electrochemical Surface Plasmon Resonance (E-SPR) Detection of Mercury Under Magnetohydrodynamic (MHD) Convection, The 42<sup>nd</sup> ACS WRM, September 23-27, 2008, Las Vegas, USA.
- C36. Liu J, Cheney M.A., **Qian S.**, and Zheng C., Theoretical study of the mechanism of mercury adsorption on the carbonaceous materials, The 42<sup>nd</sup> ACS WRM, September 23-27, 2008, Las Vegas, USA.
- C37. Liu J, **Qian S.**, Cheney M.A., and Zheng C., Modeling of homogeneous mercury oxidation in flue gas during coal combustion, The 42<sup>nd</sup> ACS WRM, September 23-27, 2008, Las Vegas, USA.



- C38. Ai Y., Jiang Y., **Qian S.**, and Joo S.W., Modeling of a Spherical Particle's Motion in a Converging-Diverging Microchannel Using Arbitrary Lagrangian-Eulerian Method, The 42<sup>nd</sup> ACS WRM, September 23-27, 2008, Las Vegas, USA.
- C39. Ai Y., Jiang Y., **Qian S.**, and Joo S.W., Transient Modeling of the Electrophoretic Migration of a Spherical Particle in a Converging-Diverging Microchannel Using Arbitrary Lagrangian-Eulerian Method, The 42<sup>nd</sup> ACS WRM, September 23-27, 2008, Las Vegas, USA.
- C40. Ai Y., Joo S.W., Jiang Y., Cheney M.A., and **Qian S.**, Electrophoretic motion of a charged particle in a converging-diverging microchannel, 1<sup>st</sup> European Conference on Microfluidics, December 10-12, 2008, Bologna, Italy.
- C41. Sadiq M.R., **Qian S.**, and Joo S.W., Electroosmotic thin film flow with a moving interface, 1<sup>st</sup> European Conference on Microfluidics, December 10-12, 2008, Bologna, Italy.
- C42. Ai Y., **Qian S.**, Jiang Y., and Joo S.W., The effect of surface charge on the phoretic motion of nanoparticles in a straight and converging-diverging channel, International Symposium on Surface Science and Nanotechnology, November 9-13, 2008, Tokyo, Japan.
- C43. Cheney M.A., Qian S., and Joo S.W., A study on the morphology control of birnessite nanoparticles, International Symposium on Surface Science and Nanotechnology, November 9-13, 2008, Tokyo, Japan.
- C44. Sadiq M.R., **Qian S.**, and Joo S.W., Spreading of an electro-osmotic micro/nanofluidic flow based on Debye-Huckel approximation: contact line motion, JSSUME 2008, August 24-26, 2008, Hamamatsu, Japan.
- C45. Joo S.W., **Qian S.**, Jiang Y., Cheney M.A., Electroosmotic flow with free surface in nanochannels, Proceedings of MicroNano08, June 3-5, 2008, Clear Water Bay, Kowloon, Hong Kong.
- C46. Moser D.P., Plata J.C., **Qian S.**, Bruckner J., McKay C.P., and Sun H., The recovery of bacterial DNA from Mars-like Atacama desert surface soil, Astrobiology Science Conference, April 14-17, 2008, Santa Clara, CA, USA.
- C47. Hou W., Das B., Jiang Y., Zhen X., **Qian S.**, Wu X., Vertically-aligned-carbon-nanotube-based Microelectrode Arrays for Neural Interfacing, IEEE International Nanoelectronics Conference (INEC) 2008, March 24-27, 2008, Shanghai, P.R.China

- C48. Hou W., Das B., Jiang Y., **Qian S.**, Zhen X., Zhen J., and Zhang Y., On a microfabricated Ti-alloy-based Microneedle array for Transdermal Drug Delivery, 3<sup>rd</sup> IEEE-International Conference of Nano/Micro Engineered and Molecular Systems, January 6-9, 2008, Sanya, Hainan, P.R. China.
- C49. Hou W., Das B., Jiang Y., **Qian S.**, Zhen X., Zhen J., and Zheng Z., Simulation of the Mechanical Properties for Diaphragm Involved in a PZT-based Valveless Micropump, 3<sup>rd</sup> IEEE-International Conference of Nano/Micro Engineered and Molecular Systems, January 6-9, 2008, Sanya, Hainan, P.R. China.
- C50. Panta Y.M., **Qian S.**, and Cheney M.A., The Use of Magneto-hydrodynamic Convection for the Determination of Mercury (II) Ions in Aqueous Solutions, 2007 APS, November 18-20, Utah, USA
- C51. Plata J.C., Moser D., Sun H., and **Qian S.**, Detecting DNA in “Mars-like” Soils from the Atacama Desert, Chile, Nevada Undergraduate Research Symposium (NURS), April 16-17, 2007, DRI, Las Vegas.
- C52. **Qian S.**, Wang A., Kabbani H., Luo X., RedOx-based magneto-hydrodynamic flow in microfluidic channels, Proceedings of MNC2007, January 10-13, 2007, Sanya, Hainan, China.
- C53. **Qian S.** and Duval J.F.L., Electrochemical modulation of electroosmotic flows in electron-conducting microchannels, ELKIN 2006, June 25-29, 2006, Nancy, France
- C54. **Qian S.** and Wang A., Electrophoretic motion of a spherical particle along the axis of a converging-diverging nanotube, EKLIN 2006, June 25-29, 2006, Nancy, France
- C55. Liu H., **Qian S.**, and Bau H.H., The Effect of a Translocating Cylindrical Particle on the Ionic Current through a Nanopore, 2005 APS, November 20-22, 2005, Chicago, USA.
- C56. Chen Z., **Qian S.**, Wang J., and Bau H.H., Buoyancy Driven Microfluidics, IMECE2004-62303, 2004 ASME International Mechanical Engineering Congress, 2004
- C57. **Qian S.** and Bau H.H., Chaotic Electroosmotic Stirrer, IMECE 2002-33763, Proceedings of IMECE'02, ASME International Mechanical Engineering Congress & Exposition, New Orleans, Louisiana, November 17-22, 2002
- C58. Bau H.H., Zhu J.Z., **Qian S.**, and Xiang Y., A Magneto-hydrodynamic Micro Fluidic Network, IMECE 2002-33559, Proceedings of IMECE'02, ASME International Mechanical Engineering Congress & Exposition, New Orleans, Louisiana, November 17-22, 2002

- C59. **Qian S.** and Bau H.H., Optimal and Robust Control of Thermal Convection in Porous Media, Proceeding of the 14<sup>th</sup> US National Congress of Theoretical and Applied Mechanics, Blacksburg, VA, ISBN: 0-9721257-0-1, June 23-28, 2002
- C60. **Qian S.** and Bau H.H., An Electroosmotic Chaotic Stirrer, Proceeding of the 14<sup>th</sup> US National Congress of Theoretical and Applied Mechanics, Blacksburg, VA, ISBN:0-9721257-0-1, June 23-28, 2002
- C61. Bau H. H., Zhu J.Z., **Qian S.**, and Xiang Y., The Use of Magneto-hydrodynamics to Pump, Control, and Stir Liquids in Micro Fluidic Systems, The 14<sup>th</sup> US National Congress of Theoretical and Applied Mechanics, Blacksburg, VA, ISBN:0-9721257-0-1, June 23-28, 2002

**Workshop Posters**

- P1. Plata J., Wang J., and **Qian S.**, Designing a magnetically activated micro-pump for a lab-on-a-chip continuous flow polymerase chain reaction (PCR) reactor, Nevada Undergraduate Research Symposium, DRI, Las Vegas, July 26, 2006.
- P2. Chen Z., Wang J., Mauk M.G., **Qian S.**, Bau H.H., Davis C., Tong G., Winslow F., Abrams W.R., and Malamud D., Continuous on-Chip Cell Lysis, DNA Isolation and Amplification, Institute for Medicine and Engineering (IME) Interdisciplinary Symposium, Philadelphia, Pennsylvania, December 2, 2004.
- P3. **Qian S.** and Bau H.H., Analysis of Laterla Flow Biodetectors: Sandwich Assay, Microfluidic / Biosensor Workshop at University of Pennsylvania, June 2003
- P4. **Qian S.** and Bau H.H., Simulating Biological Interactions with FEMLAB, The 15th Symposium of the Protein Society, Philadelphia, Pennsylvania, July 2001

**Invited Talks (Except Job Interviews)**

- 1) **Qian S.**, Electrokinetic Particle Transport in Micro/Nano-fluidics, Department of Chemistry and Biochemistry, Old Dominion University, October 6, 2011
- 2) **Qian S.**, Electrokinetic Particle Transport in Micro/Nano-fluidics, Department of Energy Science, Sungkyunkwan University, June 1, 2011
- 3) **Qian S.**, Electrokinetic Particle Transport in Micro/Nano-fluidics, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, April 26, 2011

- 4) **Qian S.**, Magnetohydrodynamics-based microfluidics and their applications, Key National Laboratory of Coal Combustion, Wuhan, China, December 11, 2009
- 5) **Qian S.**, Particle Electrophoresis in Micro/Nanofluidics, Korea Institute of Machinery & Materials, October 14, 2009
- 6) **Qian S.**, Electrokinetic Particle Transport in Micro/nanofluidics, Yeungnam University, Korea, September 15, 2009
- 7) **Qian S.**, Magnetohydrodynamic and Electrophoretic Flows for Lab-on-a-Chip Applications, Yeungnam University, Korea, May 21, 2009
- 8) **Qian S.**, Magnetohydrodynamic and Electrophoretic Flows for Lab-on-a-Chip Applications, Seoul National University, Korea, May 20, 2009
- 9) **Qian S.**, Magnetohydrodynamic and Electrophoretic Flows for Lab-on-a-Chip Applications, Pohang University of Science and Technology (POSTECH), Korea, May 19, 2009
- 10) **Qian S.**, Modeling Complex Interactions in Microfluidic Systems, Chongqing University, Chongqing, China, May 15, 2009
- 11) **Qian S.**, Fluid manipulations in microfluidic and nanofluidic systems, Huazhong University of Science and Technology, Wuhan, P.R. China, May 28, 2007
- 12) **Qian S.**, Fluid manipulations in microfluidic systems, CNRS, Nancy, France, July 3, 2006
- 13) **Qian S.**, Modeling Complex Interactions in Microfluidic Systems, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, Philadelphia, September 16, 2004
- 14) **Qian S.** and Bau H.H., Simulation of Biological Interactions in Microfluidic Systems with FEMLAB, Invited by Comsol Inc., Sweden to present at University of Pennsylvania, November 5, 2003
- 15) **Qian S.** and Bau H.H., Analysis of Lateral Flow Bio-detectors, OraSure Inc., Bethlehem, PA, July 17, 2003

### **Awards and Honors**

- Outstanding Teaching Assistant Award in Mechanical and Applied Mechanics Department at University of Pennsylvania in Fall 2004 (<http://www.me.upenn.edu/about-grad/student-awards.php>)

- The First Prize for Science and Technology Progress Award of the Ministry of Education in 1998 (<http://www.edu.cn/20010101/21432.shtml>)

## Professional Activities

### (1) Referee for the Following Professional Journals

- Analytical Chemistry
- Applied Physics Letters
- ASME
- Biomicrofluidics
- Biomedical Microdevices
- Biosensors and Bioelectronics
- Chemical Engineering Journal
- Chemical Engineering Science
- Colloids and Surfaces A: Physicochemical and Engineering Aspects
- Electrophoresis
- Energy
- Energy and Fuels
- Entropy
- Environmental Science and Technology
- Fuel
- Heat and Mass Transfer
- IEEE Transactions on Components and Packaging Technologies
- International Journal of Heat and Fluid Flow
- Journal of Chemical Physics
- Journal of Colloid and Interface Science
- Journal of Environmental Science & Technology
- Journal of Fluid Mechanics
- Journal of Fluids Engineering
- Journal of Heat Transfer
- Journal of Hazardous Materials

- Journal of Micromechanics and Microengineering
- Journal of Physics A: Mathematical and Theoretical
- Journal of Physical Chemistry
- Lab on a chip
- Langmuir
- Materials Letters
- Mathematical & Computer Modelling
- Microfluidics and Nanofluidics
- Nanoscale
- Physical Biology
- Physical Chemistry Chemical Physics
- Sensors And Actuators A: Physical
- Sensors And Actuators B: Chemical
- Separation Science and Technology
- Talanta
- The Journal of Physical Chemistry

(3) Proposal reviewer for the following funding agencies

- Israel Science Foundation (ISF)
- NIH
- NSF
- DOE
- National Research Foundation of Korea
- U.S. Army Corps of Engineers Engineer Research and Development Center (ERDC)

(3) ASME member

(4) American Nano Society member

(5) Chair of ELKIN 2006 (International Conference on Electrokinetic Phenomena), Meeting Session: Electro-Microfluidics, June 28, 2006. Nancy, France.

(6) Organizer of the session, Lab-on-a-chip technology: microfluidics/nanofluidics, for chemical and biochemical applications, in the 42<sup>nd</sup> ACS Western Regional Meeting, September 23-27, 2008, Las Vegas, Nevada, USA.

(7) Consultant for Dx Nucleic Analytics and Helixis

(8) Mentors: INBRE Undergraduate Research Opportunities Program, NSF Undergraduate Research Opportunities Program, McNair Undergraduate Research Program

(9) Faculty Senator (Student Admissions)

(10) Collaborators within 36 months

Dr. Ali Beskok	(Old Dominion University)
Dr. Amei Amei	(University of Nevada Las Vegas)
Dr. Ashutosh Sharma	(Indian Institute of Technology at Kanpur)
Dr. Biswajit Das	(University of Nevada Las Vegas)
Dr. David T. Gauthier	(Old Dominion University)
Dr. Deborah Keil	(University of Nevada Las Vegas)
Dr. Dipankar Bandyopadhyay	(Indian Institute of Technology Guwahati)
Dr. Dong-Soo Kim	(Korea Institute of Machinery & Materials)
Dr. Haim H. Bau	(University of Pennsylvania)
Dr. Hui Liu	(Hewlett-Packard)
Dr. James V. Cizdziel	(University of Nevada Las Vegas)
Dr. Jérôme F. L. Duval	(CNRS-INPL, France)
Dr. Jing Liu	(Huazhong University of Science and Technology, China)
Dr. Jing Wang	(Fluidigm Corporation)
Dr. Marcos A. Cheney	(University of Maryland Eastern Shore)
Dr. Mauroy Benjamin	(Université Paris 7 / CNRS)
Dr. Oktay Baysal	(Old Dominion University)
Dr. Sang W. Joo	(Yeungnam University, South Korea)
Dr. Sheng Liu	(Huazhong University of Science and Technology, China)
Dr. Wen-Sheng Hou	(Chongqing University, China)
Dr. Xiaobing Luo	(Huazhong University of Science and Technology, China)
Dr. Xuxin Zhao	(Shenzhen University, China)
Dr. Xiangchun Xuan	(Clemson University)
Dr. Yingtao Jiang	(University of Nevada Las Vegas)

### **Courses Taught**

- ME380: Fluid Dynamics (Fall, 2005-2007)

- MEG705: Conduction Heat Transfer (Fall, 2005-2007)
- ME416/MEG616: Introduction to Biomechanical Engineering (Spring, 2007, 2008)
- MEG795-002: Electrokinetics in Microfluidics (Spring, 2007)
- MEG710: Transport Phenomena in Bioengineering (Spring, 2008)
- AE795/895: Microfabrication (Spring, 2009 and 2010)
- Microfluidics (Fall, 2009 in Yeungnam University)
- AE795/895: Electrokinetics (Spring, 2010)
- ENGN110-Explore Engineering/Technol I (5 weeks, Spring, 2010; 9 weeks, spring, 2011)
- MATH825-Fluid Structure Interactions (2 weeks, Spring, 2010)
- AE483/Biol 496-Bio-Micro/nanofluidics (Spring, 2010)
- ME340-Computational Methods in Mechanical Engineering (Spring/Fall, 2011, 2012)

### **Supervising Graduate Students**

- Mingkan Zhang, Ph.D. of the Old Dominion University (Expect to graduate in May, 2012).
- Song Xue, Ph.D. of the Old Dominion University (Expect to graduate in May, 2015).
- Murat Bakirci, Ph.D. of the Old Dominion University (Expect to graduate in May, 2015).

### **Supervised Graduate Students**

- Juan K. Afonien, Master of the University of Nevada Las Vegas (Graduated in July, 2007)
- Yogendra Pant, Ph.D. of the University of Nevada Las Vegas (Graduated in July, 2008)
- Murat Bakirci, M.S. of the Old Dominion University (Graduate in December, 2010).
- Ye Ai, Ph.D. of the Old Dominion University (Graduated in May, 2011), winner of the 2010 Chinese Government Award for Outstanding Self-financed Students Abroad.

### **References**

1. Haim H. Bau, Professor, Mechanical Engineering and Applied Mechanics, University of Pennsylvania, Philadelphia, PA 19104. **Phone:** 215-898-8363, **E-Mail:** [bau@seas.upenn.edu](mailto:bau@seas.upenn.edu)



2. Howard H. Hu, Professor, Mechanical Engineering and Applied Mechanics, University of Pennsylvania, Philadelphia, PA 19104. **Phone:** 215-898-8504, **E-Mail:** [hhu@seas.upenn.edu](mailto:hhu@seas.upenn.edu)
3. Sang W. Joo, Professor, School of Mechanical Engineering, Yeungnam University, Gyongsan 712-749 South Korea. **E-mail:** [swjoo@ynu.ac.kr](mailto:swjoo@ynu.ac.kr)
4. Ashutosh Sharma, Professor, Department of Chemical Engineering, Indian Institute of Technology at Kanpur, Kanpure, 208016, India. E-mail: [ashutos@iitk.ac.in](mailto:ashutos@iitk.ac.in)
5. Marcos A. Cheney, Associate Professor, Department of Natural Sciences, University of Maryland Eastern Shore, Princess Anne, MD 21853. **E-mail:** [macheney@umes.edu](mailto:macheney@umes.edu)