

Dr. Guiren Wang

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EDUCATION

Stanford University	Postdoc	Mechanical Eng.	12/00 – 02/02
Technical University of Berlin/Ger.	Ph.D.	Physical Eng.	11/91- 01/99
East China Univ. of Sci. and Tech.	M.Sc.	Chemical Eng.	09/85 - 09/88
Northwest University, Xian/China	B.Sc.	Chemical Eng.	02/79 - 01/83

Strength

Strong background in **multidisciplinary fields**, including lab-on-a-chip based on nano/microfluidics; far field, **two tunable femto-lasers based optical nanoscopic system** for in situ, 3D nanoscale measurement, super resolution cellular imaging of live cell and nanofabrication; early cancer and clinical diagnostics, detection of chemical/biological agents, biomedical devices; fluid dynamics, turbulence, mixing and etc.

AWARD

- Young Investigator Award, College of Engineering & Computing, USC 2012
- Rising star, USC 2011
- NSF CAREER award 2010
- Promising Investigator Research Award, USC 2010
- North American Mixing Forum Startup Grant Award, NAMF/AIChE 2009
- Industrial Fellowship from Material and Manufacturing Ontario, Canada. 1999

TEACHING COURSES

- BMEN 260 Biosolid mechanics
- BMEN 354 BioTransport
- BMEN 589W/EMCH 562 Micro/nanofluidics and Lab-on-a-Chip
- BMEN 589W/EMCH 567 Bio Nano/Micro Electro-Mechanical Systems (BioNEMS/MEMS):
Fundamentals in Nano/Microfabrication
- BMEN 720 Transport Phenomena in Biomedical System
- EMCH 767 Micro Electro-Mechanical Systems (MEMS)

WORK EXPERIENCES

- 08/12-present Associate Professor, Biomedical Engineering Program and affiliated in Mechanical Engineering Department, **University of South Carolina (USC)**, Columbia, SC, USA
- 08/07-08/12 Assistant Professor, Biomedical Engineering Program and affiliated in Mechanical Engineering Department, **University of South Carolina (USC)**, Columbia, SC, USA
- 11/05-11/06 Adjunct Professor, Chemical Engineering Department, **University of Alabama**, Huntsville, USA.

- 2/03-07/07 Principal research engineer, Biomedical Tech. Branch, **CFD Research Corp**, Huntsville, AL
- 3/02-1/03 Senior Engineer, **Amphora Discovery Corporation (a biotech company for drug discovery)**, Mountain View/CA.
- 12/00 – 2/02 Postdoctoral Fellow, Mechanical Engineering Department, **Stanford University**
- 12/99 – 11/00 Manager, **Gracefluids Engineering**, Mississauga, ON. Canada
- 02/99–11/99 Research Scientist, R&D group, **M&I Air Systems Engineering**, Mississauga, ON. Ca.
- 12/91 – 01/99 Research Assistant, Hermann-Foettinger-Institute
Technical University of Berlin, Germany
- 4/83 - 8/85 Lecturer (Quasi), Dept. of Petrol. Chem. Eng.
10/88 - 5/90 **Liaoning University of Petrol. & Chem. Tech.** China
- 9/85 – 9/88 Research Assistant, Chem. Eng. Dept. **East China University of Science and Technology**, China

PAST AND CURRENT RESEARCH PROJECTS

- **NSF** 10/01/16-09/30/19
Title: Fractional Partial Differential Equations and Related Nonlocal Models: Fast Numerical Methods, Analysis, and Application
Role: **Co-PI** (PI: Hong Wang)
Duration: 3 year
- **USC** Honors Research Grant Application 10/15/2017 - 06/30/2018
Title: Measuring Shear Stress for Blood Flows using Microfluids Technology
Role: **PI** (with Sydney Weaver)
Duration: 1 year
- **USC** Undergraduate Research Fellowship 08/06/2016 - 06/30/2017
Title: Tumor Cells Separation and Isolation Using Dielectrophoreses in Microfluid
Role: **PI** (with Victor Madormo)
Duration: 1.5 year
- **USC** ASPIRE II 07/01/2017 - 08/31/2018
Title: Engineering Multi-Enzyme Assemblies for Efficient Catalysis
Role: **Co-PI** (PI: Qian Wang)
Duration: 1.5 year
- **USC** Magellan Scholar 01/01/16-12/31/16
Title: Microfluidics Technology for Early Detection of Colorectal Cancers
Role: **PI** (with Dillon Brown)
Duration: 1 year
- **USC** 5/16/2014 - 08/15/2015

- Title: Single cell analysis technology based on nano/microfluidics and far field nanoscopy for cancer research
 Role: **Principal Investigator**
 Duration: 1 year
- South Carolina EPSCoR/IDeA Office 07/01/13-06/31/14
 Title: Multifunctional Far-Field Nanoscopic Imaging for Biofabrication in Tissue Engineering
 Role: **Principal Investigator**
 Duration: 1 year
 - **NSF** 09/01/13-08/31/16
 Title: Collaborative Research: Deciphering Induced-Charge Electrokinetics: Multiscale Simulations and Nanoscale Flow Characterization
 Role: **Principal Investigator**
 Duration: 3 year
 - **USC** Science Undergraduate Research Fellowship (SURF) 02/01/2012 - 06/30/2012
 Title: Single cell analysis technology based on nano/microfluidics and far field nanoscopy for cancer research
 Role: **PI** (with Romel Ivan Manacho Melgar)
 Duration: 0.5 year
 - South Carolina EPSCoR/IDeA Program 07/01/11-06/30/12
 Title: Development of a Multifunctional Far-Field Nanoscopic System with Microfluidics for Biofabrication in Tissue Engineering
 Role: **Principal Investigator**
 Duration: 1 year
 - **CAREER/NSF** 05/15/10-04/14/15
 Title: CAREER: Studying Flow Velocity Distribution in Nanofluidics with a New Far-Field Nanoscopic Velocimetry
 Role: **Principal Investigator**
 Duration: 5 years
 - **Major Research Instrument (MRI)/NSF** 01/15/11-01/14/14
 Title: Development of a multifunctional far-field nanoscopic measurement system for multidisciplinary research
 Role: **Principal Investigator**
 Duration: 3 years
 Co-PI: Dr. Qian Wang (Chemistry, USC), Drs. K. Reifsnider, J. Khan (Mechanical Engineering, USC)
 - Colon Cancer Research Center, USC (Seed fund, Centers of Biomedical Research Excellence (COBRE)) 07/19/10-07/18/11
 Title: Integrated Nano- and Microfluidic Chip for Diagnosis of Early Colorectal Cancer
 Role: **Principal Investigator**
 Duration: 1 year
 - Magellan Scholar/USC 01/01/10-12/31/10

- Title: Isolation of Adult Mesenchymal Stem Cells from Peripheral Blood through Dielectrophoresis Separation
 Role: **PI** (with Nicholas Metrokos)
 Duration: 1 year
- LDRD/ Savannah River National Laboratory (SRNL) 09/15/10-09/14/11
 Title: Chemical and Biological Sensors based on Nanofluidic Preconcentration and Separation
 Role: **Co-PI**
 Duration: 1 year
 PI: Dr. Poh-Sang , Co-PI: Dr. Adrián E. Méndez Torres (SRNL)
 - INBRE/NIH 07/01/10-06/31/15
 Title: Nano- and Microfluidics Technology for Early Detection of Colorectal Cancers
 Role: **Target faculty**
 Duration: 5 years
 PI: Dr. Lucia Pirisi-Creek (USC)
 - Magellan Scholar/University of South Carolina 01/01/10-12/31/10
 Title: Microfluidics Technology for Early Detection of Colorectal Cancers
 Role: **PI** (with Mohammed Alshareef)
 Duration: 1 year
 - Promising Investigator Research Award, USC 04/10-07/11
 Title: Study Electrophoresis in a Nanochannel Using Novel Far-Field Nanoscopic Velocimetry
 Role: **Principal Investigator**
 Duration: 15 month
 - North American Mixing Forum startup grant 01/01/10-12/31/11
 Title: A novel rapid mixing process and mixer in continuous operation
 Role: **Principal Investigator**
 Duration: 2 years
 - DARPA/(SBIR): W31P4Q-07-C-0035 12/06-06/07
 Title: Novel Nanofluidics-Based Sensor System
 Amount: \$100,000 (This proposal received phase II after I left the company)
 Role: **Principal Investigator**
 Duration: 0.5 year
 - **NIH/SBIR:** 1R43NS050011-01 9/04 – 09/05
 Title: A Novel Micro Thrombectomy Catheter for Ischemic Stroke
 Amount: \$171,318
 Role: **Principal Investigator**
 Duration: 1 year
 - OSD(DoD)/SBIR: W81XWH06C0067 12/05 – 01/06
 Title: Novel Miniaturized, Electrothermal Activated, Optically Controlled, High throughput Noninvasive Drug Infusion Pump
 Amount: \$100,000
 Role: **Principal Investigator**

Duration: 0.5 year

- HSARPA (SBIR): 06/05–12/06 04/06–03/08
Title: A Novel Electrokinetics-Driven, Integrated Microfluidic Cartridge for Sample Preparation from Complex Matrices
Amount: \$825,000
Role: Co-Inv
Duration: 2.5 years
- MCSC/(SBIR): 11/02 – 09/03 01/04–01/06
Title: A Novel, Microfabricated, Electro-Immuno, Integrated Sensor-Sampler for Bioagent Collection and Detection
Amount: \$825,000
Role: Co-Inv
Duration: 2.5 years
- DHS S&T/HSARPA: 04/04 – 10/04
Title: A Novel Low Power, High Throughput, High Efficiency, Scalable Electrostatic Bioaerosol Sampler
Amount: \$75,000
Role: Co-Inv
Duration: 2 years
- NASA/SBIR: NNJ04JC07C 01/04 – 07/04
Title: A novel microfluidic device for fully automated extraction of RNA from cell cultures
Amount: \$450,000
Role: Co-Investigator
Duration: 2.5 years
- NIH/SBIR 2RH HL64500-02A1/03 09/02–10/05
Title: Development of Improved Pediatric Spacer for Inhalers
Amount: \$750,000
Role: Co-Investigator
Duration: 2 years

ACADEMIC AREAS OF INTEREST AND RESEARCH METHODS

- Nanoscopy: multifunctional far-field, two tunable femto-lasers based nanoscopic measurement system for interdisciplinary research in nanotechnology including
 - BioNEMS/MEMS, Lab-on-a-Chip
 - Bioimaging: 3-D super-resolution cellular imaging of live cell, STED, multiphoton, FLIM
 - Fast 3D Nanofabrication using visible light nanophotolithography at a low cost
 - Nanofluidics and near wall flow: study transport phenomena in nanochannel and near wall flow using our recently developed far-field nanoscopic velocimeter
 - Single cell assay: study single cell signal transduction with far-field nanoscopy (e.g. STED) and nano/microfluidics in an integrated system
 - Single molecular detection

- Clinical diagnostics: Early cancer diagnostics using lab-on-a-chip technology and far field, two tunable femto-lasers based STED nanoscopy, point of care and personal medicine
- Nano/Microfluidics: components and integration for separation of DNA, protein and cells, detection of chemical, biological and radiating agents against terrorist attack and for environmental and food monitoring using lab-on-a-chip technology and etc
- Fluid dynamics and biofluids: microfluidic turbulence, turbulence, mixing, electrokinetics, flow control and applications of fluid mechanics in biotransport phenomena.

PUBLICATIONS

PhD dissertation

Wang, G. R. (2000) Turbulent mixing, stability and secondary flow in a confined configuration. Wissenschaftliche Schriftenreihe Stroemungstechnik, Bd. 8. ISBN 3-89574-376-3, Verlag Dr. Koester.

Patents

- 1 Feng, J. J.; Guiren **Wang**, Kapil Pant, Shankar Sundaram (2011) Method and Apparatus for Separating Particles by Dielectrophoresis. US Patent 7,998,328.
- 2 Wang; G; Sundaram, S; Pant, K; Feng J, P. Storm (2010) MEMS based microcatheter for thrombectomy. US patent, 7,842,006.
- 3 Pant, K; **G Wang**; JJ Feng; S. Krishnamoorthy; S. Sundaram (2010) Electrostatic sampler and method. US Patent 7428848.
- 4 Wang, G. R.; Jiang, H. (2007) Method and Apparatus for fluid velocity measurement based on photobleaching. US patent, 7283215B2.
- 5 Krishnamoorthy, S.; **G Wang**; Feng J. (2006) Travelling wave electrothermal pump. Submitted to US patent (pending)
- 6 Fiedler, H. E.; **Wang**, G. R. (1998a) A new process for rapid and homogeneous mixing of fluids in continuous operations (in German). Deutsches Patent No. 19816354.1.
- 7 Fiedler, H. E.; **Wang**, G. R. (1998b) Anemometer based on the effect of photobleaching (in German). Deutsches Patent. No. 19838344.4.
- 8 Fiedler, H. E.; **Wang**, G. R. (1998c) Efficient heat exchanger through confined symmetric and asymmetric wakes in a pipe (in German). Deutsches Patent. No. 19850190.0.

Peer reviewed Journals

Published

1. Wei Zhao, Guiren Wang. Counter-rotating vortex shedding generated by acoustic excitations in confined mixing layers. AIChEJ. Accepted 2019.
2. Lin Lu, Ph.D; Libo Zhang; Liang Yuan, Ph.D; Tianyu Zhu; Wilfred Chen; Guiren Wang ; Qian Wang. Artificial Cellulosome Complex from the Self-Assembly of NTANi Functionalized Polymeric Micelles and Cellulases. ChemBioChem, 2019.
3. Bo Zhou, Xiaolei Zhang, Franklin Berger, Karen W. Barbour, Guiren Wang, Qian Wang. Drug screening assay based on the interaction of intact Keap1 and Nrf2 proteins in cancer cells. Bioorganic & Medicinal Chemistry. 27, 92–99, 2019.
4. Xue J, Zhao W, Nie T, Zhang C, Ma S, Wang G, Liu S, Li J, Gu C, Bai J, Wang K. Abnormal Rheological Phenomena in Newtonian Fluids in Electroosmotic Flows in a Nanocapillary. Langmuir: the ACS Journal of Surfaces and Colloids. PMID 30418030 DOI: 10.1021/acs.langmuir.8b03112. 2018.

5. Haiyun Qin, Wei Zhao, Chen Zhang, Yong Liu, Guiren Wang, and Kaige Wang Influence of fluorescence time characteristics on the spatial resolution of CW-stimulated emission depletion microscopy. *Chin. Phys. B* Vol. 27, 037803. 2018.
6. Haiyun Qin, Wenxuan Zhao, Wei Zhao, Chen Zhang, Yong Liu, Guiren Wang, Kaige Wang Evaluation of saturation intensity based on the FWHM of CW stimulated emission depletion microscopy. *Optik* 166, 219–226. 2018
7. Wei Zhao, Xin Liu, Fang Yang, Kaige Wang, Jintao Bai, Rui Qiao, and Guiren Wang Study of oscillating electroosmotic flows with high temporal and spatial resolution. DOI: 10.1021/acs.analchem.7b02985, *Anal Chem.* 2018.
8. F Shen, Y Li, G Wang, Z Liu. Mechanisms of rectangular groove-induced multiple-microdroplet coalescences. *Acta Mechanica Sinica*, 33(3):585–594. 2017.
9. Li X, Sun D, Chen Y, Wang K, He Q, Wang G. Studying compaction-decompaction of DNA molecules induced by surfactants. *Biochemical and Biophysical Research Communications.* 2017, 495(4):2559-2565.
10. Duan Yi-fei, Ma Hong-wei, Gao Ze-yang, Wang Kai-ge, Zhao Wei, Sun Dan, Wang Gui-ren, Li Jun-jie, Bai Jin-tao, Gu Chang-zhi. Reversal current observed in micro- and submicro-channel flow under non-continuous DC electric field. *Chinese Physics B* 26(6):068203, 2017
11. Yunxia Wang, Zhenhua Bai, Qian Wang, Guiren Wang. Experimental investigations on fluorescence excitation and depletion of carbon dots. *Journal of Fluorescence.* DOI 10.1007/s10895-017-2082-6. 2017.
12. Yifei Duan, Wei Zhao, Jing Xue, Dan Sun, Kaige Wang, Guiren Wang, Junjie Li, Jintao Bai and Changzhi Gu. Current characteristics of λ -DNA molecules/polystyrene nanoparticles in TBE buffer solution through micro/nanofluidic capillaries under DC electric field. *J. Phys. D: Appl. Phys.* 50 (2017) 125401.
13. M Wan, D Sun, S Wang, J Wu, Y Yang, K Wang, Qingli Heb, Guiren Wang, Jintao Bai. *Colloids and Surfaces B. : Biointerfaces* Influence of concentration on distribution properties of stretched-DNA in the MEC studied with fluorescence imaging and drop shape analyzing. 151, 11–18, 2017
14. Wei Zhao; Fang Yang; Kaige Wang; Jintao Bai; Guiren Wang. Rapid mixing by turbulent-like electrokinetic microflows. *Chemical Engineering Science.* 165, 113–121, 2017.
15. Zhao, W. Wang, G. Scaling of velocity and scalar structure functions in ac electrokinetic turbulence. *Phy. Rev. E.* 95, 023111, 2017.
16. Zhao, W. Wang, G. Influence of acoustic resonance on mixing enhancement in confined mixing layers. *Chemical Engineering and Processing.* 111 67–78, 2017.
17. Yang. F; Kuang, C; Zhao, W.; Wang, G. AC electrokinetic fast mixing in non-parallel microchannels. *Chemical Engineering Communications.* 204:190–197, 2017.
18. H Wang, K Wang, H Ma, S Dan, F Yang, S. Wang, G. Wang, J. Bai. Electrodynamics of DNA Molecules Moving Through Microfluidic Channels Studied with Single Molecular Fluorescence Imaging Technology. *Journal of Nanoscience and Nanotechnology* 16(7):6986-6991. 2016.
19. F Yang, K Wang, D Sun, W Zhao, H Wang, X. He, G. Wang and JT Bai Direct observation of λ -DNA molecule reversal movement within microfluidic channels under electric field with single molecule imaging technique. *Chin. Phys. B* Vol. 25, 078201, 2016.
20. J. Wu, K. Wang, Y. Zhou, S. Wang, C. Zhang, G. Wang, J. Bai, Synthesis and photoluminescence enhancement of nano-PAA-ZnCl₂ with controllable dimension and morphology, *Appl. Surf. Sci.* 390 122–130. doi.org/10.1016/j.apsusc.2016.08.036. 2016.
21. G.R. Wang, Fang Yang, Wei On micro-electrokinetic scalar turbulence in microfluidics at low Reynolds number, *LabChip*, 2016. 1030–1038.
22. G.R. Wang, Fang Yang, Wei Zhao Microelectrokinetic turbulence in microfluidics at low Reynolds number. *Physical Review E*, 93, 013106, 2016.
23. Wei, Zhao, Fang Yang, Jamil Khan, Ken Reifsnider, G.R Wang. Measurement of Velocity Fluctuations in Microfluidics with Simultaneously Ultrahigh Spatial and Temporal Resolution. *Experiments in Fluids.* 56:11, 2016.

24. Adolga, E. A.; Xu, Y.; Li, H.; Wang, G.; Wang, Q.; "Regioselective inverse Diels-Alder reaction of unsymmetrical tetrazines with aldehydes and ketones", *ARKIVOC*, 2015 (iv), 1-10.
25. Wei, Zhao, Fang Yang, Jamil Khan, Ken Reifsnider, G.R Wang. Corrections on LIFPA velocity measurements in microchannel with moderate velocity fluctuations. *Experiments in Fluids*. 2015, 56:39, 1–10.
26. HongWei Ma, KaiGe Wang, ZeYang Gao, HaiQing Wang, Shuang Wang, Chen Zhang, GuiRen Wang, JinTao Bai Current characteristic signals of aqueous solution transferring through microfluidic channel under non-continuous DC electric field. *AIP ADVANCES* 4, 107139 (2014)
27. ZeYang Gao · KaiGe Wang · Chen Zhang · HongWei Ma · GuiRen Wang · JinTao Bai Studying the current properties of buffer solution through micro-fluidic channels driven with the pulse bias. *Science China Technological Sciences*, 57, 249–253, 2014.
28. Chen Zhang, Kaige Wang, Shuang Wang, Yong Liu, Wei Zhao, Xiaoming Chen, Baole Lu, Changzhi Gu, Guiren Wang, and Jintao Bai. Multiple primary aberrations effect on donut-shaped laser beam in high NA focusing system. *Journal of Optics*. 2014. 16, 125701 (1-7).
29. Honglin Li, Fengyu Liu , Yi Xiao, Perry J. Pellechia, Mark D. Smith, Xuhong Qian,* Guiren Wang,* and Qian Wang*, Revisit of a series of ICT fluorophores: Skeletal characterization, structural modification and spectroscopic behavior. *Tetrahedron* 70 (2014) 5872-77.
30. G.R. Wang, Fang Yang, Wei Zhao There can be turbulence in microfluidics at low Reynolds number. *LabChip*, 2014. 14. 1452–1458.
31. Chen Zhang, Kaige Wang, Jintao Bai, Yong Liu, Guiren Wang Simulation Studying Effects of Multiple Primary Aberrations on Donut-shaped Gaussian Beam. DOI: 10.4236/opj.2013.32B001, *Optics and Photonics Journal*, 3(2B), 1-5 (2013).
32. Zhang, C.; Wang, K.; Bai, J.; Zhao, W.; Yang, F.; Wang, S.; Gu, C.; Wang, G. Nanopillar array with a $\lambda/11$ diameter fabricated by a kind of visible CW laser direct lithography system; *Nanoscale Research Letters*, 2013. 8, 280.
33. Li, H.; Guan, H.; Duan, X.; Hu, J.; Wang, G.; Wang, Q.; “An Acid Catalyzed Reversible Ring-closure Reaction of Cyano-Rhodamine Spirolactam”, *Organic & Biomolecular Chemistry* 2013, 1805–1809.
34. Cuifang Kuang, Ding Luo, Xu Liu, Guiren Wang Study on factors enhancing photobleaching effect of fluorescent dye. *Measurement* 46 (2013) 1393–1398.
35. Mohammed Alshareef, Juarez-Perez, E., Metrakos, N., Xiaoming Yang, Fadi Azer, Fang Yang, G. Wang Separation of tumor cells with dielectrophoresis-based microfluidic chip. *Biomicrofluidics* 7, 011803 (2013). Special Topic: Microfluidics In Cancer Research.
36. Ding Luo, Cuifang Kuang, Xu Liu, Guiren Wang Experimental investigations on fluorescence excitation and depletion of ATTO 390 dye. *Optics & Laser Technology* 45 (2013) 723–725.
37. Fang Yang, Xiaoming Yang, H Jiang, W. Butler, G. Wang. Dielectrophoretic Separation of prostate cancer cells. *Technology in cancer Research and Treatments*. 12:61-70. 2013.
38. Fang Yang, Xiaoming Yang, H Jiang, G. Wang Cascade and staggered continuous flow dielectrophoretic cell sorters. *Electrophoresis*. 32, 2377–2384, 2011.
39. Kaige Wang, Weijun Dang1, Dan Xi, Jintao Bai, Changzhi Gu, Guiren Wang Hybridized functional micro-nano structure for studying the kinetics of single biomolecule. *Micro & Nano Letters*. 6, 292–295, 2011.
40. Cuifang Kuang, Rui Qiao; Guiren Wang Ultrafast Measurement of Transient Electroosmotic Flow in Microfluidics. *Microfluidics and nanofluidics*. 11:353-358. 2011
41. C. Kuang, W. Zhao, G. Wang Far-field optical nanoscopy based on continuous wave laser stimulated emission depletion. *Review of Scientific Instruments* 81, 053709, (2010).
42. F. Yang, X. Yang, H. Jiang, P. Bulkhaults, P. Wood, W. Hrushesky, G.R. Wang, Dielectrophoresis Separation of Colorectal Cancer Cells. *Biomicrofluidics*, 4, 013204 (2010).
43. C. Kuang, G. Wang Far-field nanoscopic velocimeter for nanofluidics. *Lab-on-a-Chip*. 10, 240–245, (2010).

44. M. Yakut Ali, C. Kuang, J. Khan, G.R. Wang, A Dynamic Piezoelectric Micropumping Phenomenon. *Microfluidics and nanofluidics*, 9:385–396, (2009).
45. Kuang, CF; Zhao, W; Yang, F. and Wang, G. (2009) Study of the Rise Time in Electroosmotic Flow within a Microcapillary. *Analytical Chemistry*. 81, 6590–6595.
46. Wang, Y; Pant, K.; Chen, Z.; Wang, G.; Diffey, WF; Ashley, P. Shivshankar Sundaram (2009) Numerical analysis of electrokinetic transport in micro-nanofluidic interconnect preconcentrator in hydrodynamic flow. *Microfluidics and nanofluidics*. 7:683–696.
47. Kuang, CF; Zhao, W; Yang, F. and Wang, G. (2009) Measuring flow velocity distribution in microchannels using molecular tracers. *Microfluidics and nanofluidics*. 7:509–517.
48. Wang, G.R; Sas, I; Jiang, H; Janzen, W.P; Hodge, C.N. (2008) Photobleaching-based flow measurement in a commercial capillary electrophoresis chip instrument. *Electrophoresis*. 29, 1253–1263.
49. Wang, G. R. (2006) On large structures and turbulent mixing in confined mixing layers under forcing. *AIChEJ*. 52, 111-124.
50. Wang, G. R. (2005) Laser-induced fluorescence photobleaching anemometer for microfluidic devices. *Lab on a Chip*, 5, 450 – 456.
51. Wang, G. R., Santiago, J. G., Mungal, M. G. Yang, B., & Papademetriou S., (2004) A laser induced cavitation pump. *Journal of Micromechanics and Microengineering*. 14, 1037-1046.
52. Wang, G. R. (2003) A rapid mixing process in continuous operation under periodic forcing. *Chemical Engineering Science*. 58, 4953-4963.
53. Wang, G. R.; Fiedler, H. E. (2000) On high spatial resolution scalar measurement with LIF. Part 1: Photobleaching and Thermal Blooming. *Experiments in Fluids*. 29, 257-264.
54. Wang, G. R.; Fiedler, H. E. (2000) On high spatial resolution scalar measurement with LIF. Part 2: The Noise Characteristics. *Experiments in Fluids*. 29, 265-274.
55. Dai, G. C., Wang, G. R., Fan, Z. H. (1989a) Transition from laminar to turbulent flow in artificially roughened pipes. *J. East China Institute of Chemical Technology*. 15, 580-584.
56. Dai, G. C., Fan, Z. H, Wang, G. R. (1989b) Flow resistance in repeated-rib tubes. *J. East China Institute of Chemical Technology*, 15, 300-304.
57. Fan, Z. H, Dai, G. C., Jin, D. Y., Wang, G. R. (1989c) Turbulent flow in artificially roughened pipes. *J. East China Institute of Chemical Technology*, 15, 305-312.
58. Wang, G. R; Zhang, B. G. (1984) Study of heat transfer of the horizontal immersed tubes in fluidized beds. *J. Fushun Petroleum Institute. No. 2*.

Book Chapter

1. Jiang, H; Wang, G.R. (2008) Thermocapacitive Flow Sensor. In. Li, Dongqing (ed) *Encyclopedia of Microfluidics and Nanofluidics*. 2025-2032.
2. Jiang, H; Wang, G.R. (2013) Far field nanoscopic measuring technique. In. Li, Dongqing (ed) *Encyclopedia of Microfluidics and Nanofluidics*. 2nd edition. DOI: 10.1007/978-3-642-27758-0_1730-1.

Conferences papers and presentation

- 1 Wei Zhao, Fang Yang, Guiren Wang Transition of AC electroosmotic flow to chaos nearby electric double layer by frequency-dependent. 71th Annual Meeting of the APS Division of Fluid Dynamics, November 18–20, 2018; Atlanta, Georgia.
- 2 Wei Zhao, Guiren Wang. Extended self-similarity and abnormal intermittency factor of hierarchical velocity structures in micro electrokinetic turbulence. 71th Annual Meeting of the APS Division of Fluid Dynamics, November 18–20, 2018; Atlanta, Georgia.
- 3 Akrm Abdalrahman, Guiren Wang Measurement of water flux through aquaporin of erythrocyte with fluorescence. BMES 2018 Annual Meeting. October 17–20, Atlanta, Georgia.

- 4 Libo Zhang, Andrew Beatty, Thomas M. Makris, Guiren Wang, Qian Wang. Microfluidics assisted fabrication of polymer protein core-shell nanoparticles via co-assembly. 19th International Symposium on Field- and Flow-based Separations (FFF2018). Columbia, SC. May 14-17, 2018.
- 5 Xin Liu, X.; Guiren Wang. Pulsed-Field Electrophoresis in a Microfluidic Device. 19th International Symposium on Field- and Flow-based Separations (FFF2018). Columbia, SC. May 14-17, 2018.
- 6 Audrey Wang, Akrm Abdalrahman, Jianyu Deng, Guiren Wang. Two-Photon Absorption Based Nanoscopic Velocimeter. 70th Annual Meeting of the APS Division of Fluid Dynamics, November 19–21, 2017; Denver, Colorado.
- 7 Wei Zhao, Xin Liu, Fang Yang, Kaige Wang, Jintao Bai, Rui Qiao, Guiren Wang. Study of oscillating electroosmotic flows with high temporal and spatial resolution. 70th Annual Meeting of the APS Division of Fluid Dynamics, November 19–21, 2017; Denver, Colorado.
- 8 Wei Zhao, Guiren Wang. Cascade of kinetic energy and scalar variance in DC electrokinetic turbulence. 70th Annual Meeting of the APS Division of Fluid Dynamics, November 19–21, 2017; Denver, Colorado.
- 9 Wei Zhao, Fang Yang, Guiren Wang Micro Electrokinetic Turbulence and Its Measurement in a Microchannel. 2017 AIChE Annual Meeting. October 29 - November 3, 2017. Minneapolis, MN.
- 10 Wei Zhao, Guiren Wang. Counter-Rotating Vortex Shedding Generated By Acoustic Excitations in Confined Mixing Layers. 2017 AIChE Annual Meeting. October 29 - November 3, 2017. Minneapolis, MN.
- 11 Xin Liu and Travis Stewart, Guiren Wang. Pulsed-Field Electrophoresis for Microfluidic Devices. 2017 AIChE Annual Meeting. October 29 - November 3, 2017. Minneapolis, MN.
- 12 Audrey Wang, Akrm Abdalrahman, Jianyu Deng, Guiren Wang. Two-Photon Excitation Based Nanoscopic Velocimeter Using Small Neutral Molecular Dye as Tracer. MicroTAS 2017: The 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences that will be held in Savannah, Georgia, USA, October 22 – 26, 2017.
- 13 Audrey Wang, Akrm Abdalrahman, Jianyu Deng, Guiren Wang. Two-Photon Excitation Based Velocimeter for Blood Flow Measurement with Ultrahigh Spatial Resolution. BMES 2017 Annual Meeting. Phoenix, Arizona.
- 14 Wei Zhao, Xin Liu and Guiren Wang AC electroosmotic flow measured with Laser Induced Fluorescence Photobleaching Anemometer. International Conference of Microfluidics, Nanofluidics and Lab-on-a-Chip. June 10-12, Dalian, China, 2016.
- 15 Wei Zhao, Fang Yang, Kaige Wang, Jintao Bai, Guiren Wang Micro Electrokinetically forced turbulent mixing in a microchannel. International Conference of Microfluidics, Nanofluidics and Lab-on-a-Chip. June 10-12, Dalian, China, 2016.
- 16 Feng Shen, Bin Zhou, Guiren Wang Direct measurements of fluid slip using laser induced fluorescence photobleaching anemometer (LIFPA). International Conference of Microfluidics, Nanofluidics and Lab-on-a-Chip. June 10-12, Dalian, China, 2016.
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- 19 Wei Zhao, Fang Yang, Guiren Wang. Scaling of velocity and scalar structure functions in electrokinetic turbulence. 2014. 67th Annual Meeting of the APS Division of Fluid Dynamics, Vol.59, November 23-25, San Francisco, California.
- 20 Wei Zhao, Fang Yang, Jamil Khan, Ken Reifsnider and Guiren Wang. Statistical correction on LIFPA measurement. 2014. 67th Annual Meeting of the APS Division of Fluid Dynamics, Vol.59, November 23-25, San Francisco, California.

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- 22 Fang Yang; Wei Zhao; Guiren Wang Electrokinetically driven turbulent mixing in microfluidics with low Reynolds number. 2nd International Conference on Small Science (ICSS), December 16-19, Walt Disney World Swan and Dolphin, Orlando FL, USA. 2012. (Invited).
- 23 Fang Yang W. Zhao, Guiren Wang Turbulent mixing in microfluidics with Reynolds number in the order of 1. 65th Annual Meeting of the APS Division of Fluid Dynamics, Vol.57, November 18-20, San Diego, California. 2012
- 24 Guiren Wang Fang Yang Wei Zhao Can a flow be turbulent in microfluidics with Reynolds number in the order of 1? 65th Annual Meeting of the APS Division of Fluid Dynamics, Vol.57, November 18-20, San Diego, California. 2012
- 25 Wei Zhao, G. Wang Trailing edge effect on fast mixing in forced confined mixing layers. 65th Annual Meeting of the APS Division of Fluid Dynamics, Vol.57, November 18-20, San Diego, California. 2012
- 26 G. Wang Dielectrophoresis (DEP) in a Microfluidics Platform to Study Isolation and Enrichment of Cancer Cells. 6th World Circulating Tumor Cell, November 13th -15th, 2012 in Boston, USA. (Invited).
- 27 Guiren Wang, Fang Yang and Wei Zhao Electrokinetically Driven Micro-Turbulence in Microfluidics with Re in the Order of 1. AIChE Annual meeting, Oct. 28 -, Nov. 2, 2012. Pittsburgh, PA.
- 28 Wei Zhao; Guiren Wang The Evolution of Kinetic Energy in Actively Forced Confined Mixing Layers. AIChE Annual meeting, Oct. 28 -, Nov. 2, 2012. Pittsburgh, PA.
- 29 G. Wang, W. Zhao Ultrafast quasi Pipeline Mixing Process and Mixer in Forced Confined Mixing Layers. Mixing XXIII, North American Mixing Forum, June 17 – 23, 2012, Cancun, Mexico
- 30 Fang Yang, Wei Zhao, G. Wang Turbulent mixing in microfluidics where Reynolds number is in the order of 1. 3rd Advances in Microfluidics and Nanofluidics (AMN) May 23-26, 2012, Dalian, China
- 31 Fang Yang W. Zhao, Guiren Wang Random Electrokinetic Flow Phenomenon in Microfluidics. In: 3rd ASME Micro/Nanoscale Heat & Mass Transfer International Conference: 2012; Atlanta, GA, USA 2012.
- 32 Fang Yang, CF. Kuang, Wei Zhao, Guiren Wang: AC Electrokinetic Fast Micromixer with Conductive Side Walls. In: 3rd ASME Micro/Nanoscale Heat & Mass Transfer International Conference: 2012; Atlanta, GA, USA 2012.
- 33 Guiren Wang; F. Yang; Dielectrophoresis (DEP) in a Microfluidics Platform to Study Isolation and Enrichment of Cancer Cell. 2nd Annual Circulating Tumor Cells: Expediting Clinical Use. 19th International Molecular Med. Feb. 21-23, 2012, San Francisco, CA. (Invited).
- 34 Fang Yang CF, Kuang, Wei Zhao, Guiren Wang: Fast mixing in a non-parallel microfluidic chip using AC electrokinetic instability. In: 2012 South Carolina INBRE Scientific Symposium: 2012; Columbia, SC, USA; 2012.
- 35 Fang Yang, W. Zhao, G. Wang (2011) Some turbulent like flow property observed in microfluidics, 64th Annual Meeting of the APS Division of Fluid Dynamics , Vol.56, November 20–22, 2011; Baltimore, Maryland.
- 36 Fang Yang; Xiaoming Yang; Hong Jiang; Guiren Wang. Cascade and staggered dielectrophoretic cell sorters. 64th Annual Meeting of the APS Division of Fluid Dynamics , Vol.56, November 20–22, 2011; Baltimore, Maryland.
- 37 Wei Zhao and Guiren Wang. Nonlinear Response of a Confined Mixing Layer to Active Forcing. AIChE Annual meeting, October 16-21, 2011, Minneapolis, MN.
- 38 Guiren Wang, Fang Yang, Xiaoming Yang and Hong Jiang. Dielectrophoretic Cell Sorters for High Purity and Throughput. AIChE Annual meeting, October 16-21, 2011, Minneapolis, MN.
- 39 Wei Zhao and Guiren Wang; Role of Streamwise Vortices On Mixing Process In Highly Excited Confined Mixing Layer. AIChE Annual meeting, October 16-21, 2011, Minneapolis, MN.

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- 41 Adrian E. Mendez-Torres, Ricardo D. Torres, Poh Sang Lam, Guiren Wang. Atomic Force Lithography of Nano/Microfluidic Channels for Verification and Monitoring of Aqueous Solutions. Institute of Nuclear Materials Management (INMM) Annual Meeting 2011, July 17-21, Palm Spring Ca.
- 42 Wang, G; Zuo, A. (2010) Investigation of flow velocity profile in a nanocapillary. *Bull. Am. Phys Soc. Vol 54*
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- 44 Wang, G.; Kuang, C.; Zuo, A. (2010) Far-Field Optical Nanoscopy Based On Continuous Wave Laser Stimulated Emission Depletion (STED) for Nanofluidics. AIChE Annual meeting; Salt Lake City, Utah, Nov, 2010.
- 45 Zhao, W.; G. Wang (2010) Nonlinear mechanism for mixing enhancement in confined mixing layer. AIChE Annual meeting, Salt Lake City, Utah, Nov, 2010.
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- 47 Fang Yang, Xiaoming Yang, H Jiang, G. Wang (2010) Continuous flow cell sorter based on dielectrophoresis. AIChE Annual meeting; Salt Lake City, Utah, Nov, 2010
- 48 Zhao, W., Wang, G. R. (2010) Novel Ultrafast Inline Mixing Process and Mixer Based on Receptivity. XXII Biennial North American Mixing Conference. Victoria, Canada.
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- 50 Kuang, CF, **Wang**, GR.(2009) Nano-Velocimetry for Nanofluidics. *Bull. Am. Phys Soc. Vol 54.*
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- 52 Zhao, W.; G. Wang (2009) A New Mechanism for Mixing Enhancement in Turbulent Mixing Layer. *Bull. Am. Phys Soc. Vol 54.*
- 53 Yang, F.; X. Yang; H. Jiang; P. Wood; W. Hrushesky; GR. Wang (2009) Colon Cancer Cell Separation by Dielectrophoresis. *Bull. Am. Phys Soc. Vol 54.*
- 54 Wang, G.R (2009) Ultrafast inline mixing process. AIChE Annual meeting; Nashville, TN, Nov. 8-13, 2009
- 55 Kuang, C.; W. Zhao; G.R.Wang (2009) CW laser STED system for Far-field optical microscopy. National Institutes of Health Workshop on Optical Diagnostic and Biophotonic Methods from Bench to Bedside. Oct. 1 – 2, 2009, Bethesda, Maryland, USA
- 56 Kuang, C., G.R. Wang (2009) Novel ultrafast far-field nanoscopic velocimeter for lab-on-a-chip applications. Lab-on-a-Chip World Congress, San Francisco Conference Center, Aug. 6-7, 2009. (Invited talk).
- 57 Yang, F., Cuifang Kuang, Wei Zhao, Guiren Wang (2009) A new design of AC electrokinetic micromixer. 83rd ACS Colloid and Surface Science Symposium and the 13th International Conference on Surface and Colloid Science. Columbia University in New York, NY, June 14 - 19, 2009.
- 58 Kuang, CF, **Wang**, GR, (2008) Study on the rise time of electroosmotic flow in microcapillary tubes. 60th Annual Meeting of the Division of Fluid Dynamics, San Antonia, Texas. November 23–25, 2008.
- 59 Khan, J.; G. R. **Wang**; D. McCants, Aly H. Shaaban (2008) Heat transfer enhancement using nanofluid and novel active flow control. The Thermal Management Materials and Sciences Workshop, 16-17, September 2008. National Composite Center (NCC), 2000 Composite Drive, Kettering, Ohio, 45420.

- 60 Wang, G.R, Jiang, H. (2008) Mixing Phenomenon in a Confined Plane Wake in a Pipe. 6th International Symposium on Mixing in Industrial Processes (ISMIP6), August 17-21, 2008, Niagara Fall, Canada.
- 61 Pant, Kapil, Guiren **Wang**, Balabhaskar Prabhakarpanedian and Shivshankar Sundaram (2007) Electric Field Driven Lysis of Gram-Positive Bacterial Cells. The 2007 Scientific conference on chemical & biological defense research. Nov. 13-15, 2007, Timonium, Maryland, USA.
- 62 Wang, G.R.; Jiang, H. (2007) Symmetric breaking hysteresis in a plane wake. 60th Annual Meeting of the Divison of Fluid Dynamics, Salt Lake City, Utah, Bull. Am. Phys Soc. Vol 52.
- 63 Guo, Junpeng; Guiren **Wang**; David J. Brady (2006) Super-Resolution Mapping of Flow Velocity Distribution in Nanofluidic Channels. Frontiers in Optics/Laser Science XXII, The 90th Optical Society of America Annual Meeting. Oct. 8-12, 2006, Rochester, New York, USA.
- 64 Wang, G.R; Pant, K; Storm, P; Feng, J; Prabhakarpanedian, B; Sundaram, S; (2006) Piezo-actuated Mechanical Thrombolysis Microcatheter for Acute Ischemic Stroke. BMES Annual Fall Meeting, Oct. 11-14, 2006, Chicago, IL.
- 65 Wang, G.R.; J. Guo; Y. Lin, J. Feng, J. Wei, Y. Wang; S. Krishnamoorthy; S. Sundaram (2006) Laser-Induced Fluorescence Photobleaching Anemometer for Flow Velocity Measurement in Sub-Microscale Fluidic Channels. IEEE Lasers and Electro-Optics Society, Summer Topical Meetings, 17 – 19 July 2006, Quebec City, QC, Canada.
- 66 Feng, J. J.; S. Krishnamoorthy, G. W. **Wang**, and S. Sundaram (2006) Simulation of Electrokinetic Flow and Analyte Transport in Nano Channels. NSTI-Nanotech, Vol. 2, 505-508, May 7-11, 2006, Boston, Massachusetts, U.S.A.
- 67 Wang; G. R.; J.J. Feng; S. Vasantgadkar; K. Pant; B. Prabhakarpanedian; S. Krishnamoorthy; S. Sundaram (2006) A Continuous Particle/Cell Sorter Using Dielectrophoresis. NSTI-Nanotech 2006, Vol. 2, 570-573, May 7-11, 2006, Boston, Massachusetts, U.S.A.
- 68 K. Pant, J. Feng, G. **Wang**, S. Krishnamoorthy and S. Sundaram (2004) Separation of bioparticulate matter using traveling wave dielectrophoresis. 7th International Conference on Miniaturized Chemical and Blochemlcal Analysts Systems, October 5-9, 2003, Squaw Valley, Callifornia USA. Pp 1207-1210.
- 69 Wang, G. R.; J. G. Santiago; M. G. Mungal (2002) Interaction between laser-induced cavitation flow and a micro tube: micro pumping effect. *Annual Thermal And Fluid Science Affiliate Conference*, Stanford, CA, Feb. 2002.
- 70 Wang, G. R.; Santiago, J. G.; Mungal, M. G. (2001) Some visualization observations of laser induced cavitation flow. *Bull. Am. Phys Soc. Vol 44*.
- 71 Wang, G. R., Fiedler, H. E. (1999e) On turbulent mixing in a confined mixing layer in a pipe. 17th Biennial North American Mixing Conference. Banff, Albert, Canada.
- 72 Wang, G. R.; Fiedler, H. E. (1998d) A new receptivity mechanism in a confined configuration. *Bull. Am. Phys Soc. Vol 43*.
- 73 Wang, G. R.; Fiedler, H. E. (1998e) Scalar power spectral density in a confined wake in a pipe. *Bull. Am. Phys Soc. Vol 43*.
- 74 Wang, G. R.; Spieweg, R.; Fiedler, H. E. (1998f) Turbulent mixing in a confined plane wake in a pipe. *Bull. Am. Phys Soc. Vol 43*.
- 75 Wang, G. R.; Fiedler, H. E. (1998g) On high spatial resolution scalar measurement with LIF. *Bull. Am. Phys Soc. Vol 43*.
- 76 Wang, G. R.; Fiedler, H. E. (1998h) On turbulent mixing criterion. *AIChE 1998 Annual Meeting, Miami*.
- 77 Wang, G. R.; Fiedler, H. E. (1998i) A new flow for an ideal mixed reactor. *Ibid*.
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- 79 Wang, G. R., Fiedler, H. E. (1996) Paring burst - a new phenomenon. *Bull. Am. Phys Soc. Vol 41*.

REVIEW PANELS

- Served on NSF proposal review panels 2008, 2009a, 2009b, 2010, 2011, 2014
- Served on NIH proposal review panels 2007, 2009
- Served on DoD proposal review, 2014
- Served on Dutch Technology Foundation STW proposal review, 2014

REVIEWER FOR JOURNALS

- AIChE Journal
- Analytical Chemistry
- Biomedical Microdevices
- Biomicrofluidics
- Cancers
- Electrophoresis
- IEEE Transactions on Biomedical Engineering
- Industrial & Engineering Chemistry Research
- Instrumentation Science & Technology
- International journal of heat and mass transfer
- Journal of Colloid and Interface Science
- Journal of Microelectromechanical Systems
- Lab-on-a-Chip
- Measurement Science and Technology
- Microfluidics and nanofluidics
- Nanotechnology
- Optics letter
- Sensor and Actuator B, Chemical
- Small
- Superlattice and microstructures

CONFERENCE SERVICE

- International Conference of Microfluidics, Nanofluidics and Lab-on-a-Chip. Chair and organizer of Track 2 Measurement and Detection Technologies. June 10-12, Dalian, China, 2016.
- Annual meeting of American Institute of Chemical Engineers, 2012. Served as Session chair of Nanoscale Electrokinetics
- 3rd ASME Micro/Nanoscale Heat & Mass Transfer International Conference. Session chair of Visualization and measurement
- Annual meeting of American Institute of Chemical Engineers, 2011. Served as
 - Session chair of Microfluidics Detection
 - Session co-chair of Turbulent flows
 - Session co-chair of Multiphase mixing
- 63rd Annual Meeting of the Am. Phys Soc, Division of Fluid Dynamics Annual meeting, 2010. Session chair of MK Biofluids Cellular II.
- 2nd ASME Micro/Nanoscale Heat & Mass Transfer International Conference (MNHMT09), Shanghai, P. R. China, December 18-21, 2009. Session chair of Lab on a chip

INVITED PRESENTATION

- Wei Zhao, Xin Liu and Guiren Wang. AC electroosmotic flow measured with Laser Induced Fluorescence Photobleaching Anemometer. International Conference of Microfluidics, Nanofluidics and Lab-on-a-Chip. June 10-12, Dalian, China, 2016.

- Wang, GR; F. Yang; W. Zhao. Electrokinetically driven turbulent mixing in microfluidics with low Reynolds number. 2nd International Conference on Small Science (ICSS), December 16-19, Walt Disney World Swan and Dolphin, Orlando FL, USA. 2012
- Wang, GR. et al. Dielectrophoresis (DEP) in a Microfluidics Platform to Study Isolation and Enrichment of Cancer Cells. 6th World Circulating Tumor Cell, November 13th -15th, 2012 in Boston, USA.
- Wang, GR. et al. Dielectrophoresis (DEP) in a Microfluidics Platform to Study Isolation and Enrichment of Cancer Cell. 2nd Annual Circulating Tumor Cells: Expediting Clinical Use. Feb. 21-23, 2012, San Francisco, CA.
- Wang, GR. Microfluidics and Microfluidic pumps. SC Johnson, Racine, WI, 2010.
- Wang, GR. Cuifang Kuang. Study on the Rise Time of Electroosmotic Flow in a Microcapillary. Lab-on-a-Chip World Congress 2009, San Francisco, CA, USA. 2009.
- Wang, GR. Fluid mechanics, through microfluidics, towards biomedical engineering and biotechnology. University of Alabama in Huntsville, Hudson Biotechnology Seminar Series, 2004.

MEMBERSHIP

- North American Mixing Forum (NAMF)
- American Institute of Chemical Engineers (AIChE)
- American electroplaters society, since 2010
- American Physical Society (APS), since 2007
- American Chemical Society (ACS), 2009
- Association of Laboratory Automation (ALA), 2003
- Founder of Chinese Life Science Association in Huntsville, 2006-2007

Education activities

- Supervised three postdoctoral fellows
- Supervised two PhD students, one graduated; also co-supervised one PhD student (graduated)
- Supervised four MS students and co-supervised one with Dr. J. Khan (Two graduated from Mech. Eng, one from Biomed. Eng.)
- Supervised multiple undergraduate students for Biomedical Engineering. Some received awards in USC.
- Undergraduate committee member of Biomedical Engineering Program, USC.

SUPERVISED STUDENTS

- Ph.D: Fang Yang; Wei Zhao
Co-Supervised: Chen Zhang
- MSc. John Merriman (Biomed Eng); Paul Wach; Yunxia Wang
- Many undergraduate students

HOBBY

Tai Qi Chuan, Calligraphy