

PONG-YU (PETER) HUANG

Assistant Professor

Department of Mechanical Engineering
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PROFESSIONAL PREPARATION

Cornell University	B.A.	Physics, <i>Cum Laude</i>	2000
Brown University	M.S.	Engineering	2003
Brown University	Ph.D.	Engineering	2007
Tufts University	Postdoctoral	Biomedical Engineering	2006 – 2008

PROFESSIONAL APPOINTMENTS

Assistant Professor	Binghamton University	Mechanical Engineering	2008 – present
Postdoctoral Associate	Tufts University	Biomedical Engineering	2006 – 2008

RESEARCH THRUSTS

- Micro/Nanoscale fluid, colloidal and multiphase dynamics
- Micro/Nanoscale optofluidic sensors and actuators
- Colloidal and adhesion dynamics of pathological cells
- Optofluidic detection of microorganisms and pathological cells
- Biomedical devices
- Micro- and nanoscale measurement techniques
- Cellular Behaviors

JOURNAL PUBLICATIONS

- ◆ P. Huang. Evanescent Wave Particle Velocimetry. In preparation, 2013.
- ◆ W. Wang and P. Huang. Direct measurement of hindered diffusion of colloidal particles in close proximity to a liquid-liquid interface. In preparation, 2013.
- ◆ W. Wang and P. Huang. Extracting position distribution and depletion layer thickness of near-wall colloidal particles through ensemble statistical analysis. In preparation, 2013.
- ◆ W. Wang and P. Huang. Accuracy of inferred position distribution measured from 3D evanescent wave particle velocimetry. In preparation, 2013.
- ◆ W. Wang, J. S. Guasto, and P. Huang. Measurement bias in evanescent wave nanovelocimetry due to particle size variations. *Experiments in Fluids*, **51**, 1685-1694, 2011.
- ◆ C. Greiner, M. Hunter, F. Rius, P. Huang and I. Georgakoudi. Confocal backscattering-based detection of leukemic cells in flowing blood samples. *Cytometry A*, **79**, 874-883, 2011.
- ◆ C. Greiner, M. Hunter, P. Huang, F. Rius and I. Georgakoudi. Confocal backscattering spectroscopy for leukemic and normal blood cell discrimination. *Cytometry A*, **79**, 866-873, 2011.
- ◆ P. Huang, J. S. Guasto, and K. S. Breuer. The effects of hindered mobility and depletion of particles in near-wall shear flows and the implications for nano-velocimetry. *Journal of Fluid Mechanics*, **637**,

241-265, 2009.

- ◆ P. Huang, M. Hunter and I. Georgakoudi. A confocal light scattering spectroscopic imaging system for in situ tissue characterization. *Applied Optics*, **48**, 2595-2599, 2009.
- ◆ B. J. Schmidt, P. Huang, K. S. Breuer and M. B. Lawrence. A catch strip assay for the relative assessment of rapid, two-dimensional protein association kinetics. *Analytical Chemistry*, **80**, 944-950, 2008.
- ◆ P. Huang and K. S. Breuer. Direct measurement of anisotropic near-wall hindered diffusion using total internal reflection velocimetry. *Physical Review E*, **76**, 046307, 2007.
- ◆ P. Huang and K. S. Breuer. Direct measurement of slip length in electrolyte solutions. *Physics of Fluids*, **19**, 028104, 2007.
- ◆ J. S. Guasto, P. Huang, and K. S. Breuer. Statistical particle tracking velocimetry using molecular and quantum dot tracer particles. *Experiments in Fluids*, **41**, 869-880, 2006.
- ◆ P. Huang, J. S. Guasto, and K. S. Breuer. Direct measurement of slip velocities using 3-D total internal reflection velocimetry. *Journal of Fluid Mechanics*, **566**, 447-464, 2006.
- ◆ S. Jin, P. Huang, J. Park, J. Y. Yoo and K. S. Breuer. Near-surface velocimetry using evanescent wave illumination. *Experiments in Fluids*, **37**, 825-833, 2004.

CONFERENCE PROCEEDINGS

- ◆ S. Mina, W. Wang, G. Mahler, and P. Huang. Development of 3D Microfluidic Device to Study Endothelial-to-Mesenchymal Transformation. *Proceedings of the 39th Annual Northeast Bioengineering Conference*, Syracuse, New York, April 2013.
- ◆ B. Laughlin, A. Tabatabaie, and P. Huang. Accuracy of external force measurements based on particle tracking velocimetry. *Proceedings of ASME-IMECE*, Lake Buena Vista, Florida. IMECE2009-11214, November 2009.
- ◆ J. S. Guasto, P. Huang, and K. S. Breuer. Measurement and simulation of near-wall colloidal behavior. *IUTAM Symposium on Micro and Nanoscale Fluid Dynamics*. Dresden, Germany. September 2007.
- ◆ J. S. Guasto, P. Huang, and K. S. Breuer. Statistical particle tracking velocimetry using molecular and quantum dot tracer particles. *Proceedings of ASME-IMECE*, Orlando, Florida. November 2005.
- ◆ P. Huang, J. S. Guasto, and K. S. Breuer. Direct measurement of slip velocities using 3-D total internal reflection velocimetry. *Proceedings of ASME-IMECE*, Orlando, Florida. IMECE2005-79938, November 2005.
- ◆ P. Huang and K. S. Breuer. Direct measurement and simulation of apparent slip velocities in sub micron scale flows. *Proceedings of ICTAM*. Warsaw, Poland. August 2004.
- ◆ S. Jin, P. Huang, J. Park and K. S. Breuer. Near-surface velocimetry using evanescent wave illumination. *Proceedings of ASME-IMECE*, Washington, D.C. IMECE2003-44015, November 2003.
- ◆ S. Jin, P. Huang, J. Park, J. Y. Yoo and K. S. Breuer. Near-wall PTV measurements using evanescent wave illumination. *Proceedings of the 5th International Symposium on Particle Image Velocimetry*. Busan, Korea. PIV'03 Paper 3237. September 2003.
- ◆ P. Huang and K. S. Breuer. Performance and scaling of an electro-osmotic mixer. *Proceedings of IEEE Transducers 03*. Boston, MA. June 2003.
- ◆ J. Westin, C.-H. Choi, P. Huang, Z. Cao, K. S. Breuer, B. Caswell, P. Richardson and M. Sibalukin. Liquid transport properties in submicron channel flows. *Proceedings of ASME-IMECE*. New York, NY. November 2001.

BOOK CHAPTERS

- ◆ P. Huang, J. S. Guasto, and K. S. Breuer. Evanescent wave microscopy. *Encyclopedia of Micro- and Nano-fluidics*, 2nd ed., Dongqing Li (ed.), Springer, 2012.
- ◆ P. Huang, J. S. Guasto and K. S. Breuer. Near-surface particle tracking velocimetry. *Microfluidics and Nanofluidics Handbook*, Sushanta K. Mitra and Suman Chakraborty (ed.), CRC Press, 2011.
- ◆ J. S. Guasto, P. Huang and K. S. Breuer. Evanescent wave microscopy. *Encyclopedia of Micro- and Nano-fluidics*, 1st ed., Dongqing Li (ed.), Springer, 2008.

CONFERENCE PRESENTATIONS

- ◆ W. Wang, J. Guasto, and P. Huang, Measurement bias in evanescent wave microscopy velocimetry due to particle size variation. The 63rd annual APS-DFD Meeting, Long Beach, CA. November 2010.
- ◆ P. Huang and K. S. Breuer. Measurement and simulation of hindered diffusion and the implications for near-wall velocimetry. The 59th annual APS-DFD Meeting, Tampa, FL. November 2006.
- ◆ P. Huang, J. S. Guasto, and K. S. Breuer. Direct measurement of liquid slip velocities using total internal reflection velocimetry. The 58th annual APS-DFD Meeting, Chicago, IL. November 2005.
- ◆ P. Huang, S. Jin, J. Park and K. S. Breuer. Slip and apparent slip in submicron flows. The 56th annual APS-DFD Meeting, Meadowland, NJ. November 2003.

PATENT

- ◆ I. Georgakoudi, P. Huang, and M. Hunter. Methods and System for Confocal Light Scattering Spectroscopic Imaging. US patent no. 13/139,953.

INVITED PRESENTATIONS

- ◆ Integrated Electronics Engineering Center (IEEC), Binghamton University, “Combining Optics and Microfluidics for Biological and Medical Applications”, Technical Advisory Board Meeting, October 2010.
- ◆ National Taiwan University, “Exploration of near-surface transport phenomena masked by nanoscale randomness,” January 2009.
- ◆ University of Rhode Island, “Dancing with the particles: direct measurement of near-surface transport phenomena in the nanoscale,” April 2008.
- ◆ San Diego State University, “Near-surface transport phenomena in the nanoscale,” February 2008.

INSTRUCTIONAL HISTORIES

ME 351, Fluid Mechanics	2011, 2013
ME 441, Heat Transfer	2009 – 2012
ME 480B, Microfluidics	2012
ME 550, Introduction to Fluid Dynamics	2008, 2010
ME 580B, Transport at the Micro/Nanoscale	2009, 2013
ME 580B, Small-Scale Diagnostic Techniques in Mechanical Engineering	2011
Senior Design Projects	
<i>Fluid Mechanics Experiment for Instrumentation and Measurement Course</i>	2009 – 2010
<i>Height Adjustable Platform for Microfluidic Experiments</i>	2010 – 2011
<i>Medical Refrigerator</i>	2011 – 2012
<i>Optical Table Transport System</i>	2011 – 2012
<i>CO2 Control System for Microscope Stage-Top Incubator</i>	2012 – 2013

PROFESSIONAL SERVICES

Co-organizer, Track 33 Measurement and Instrumentation at Microscale, ASME 10th International Conference on Nanochannels, Microchannels, and Minichannels 2012, Puerto Rico.
Co-organizer, Microfluidics Forum, ASME International Mechanical Engineering Conference & Exposition 2011, Denver, Colorado.
Organizer & Session Chair, Microfluidics Forum, ASME International Mechanical Engineering Conference & Exposition 2010, Vancouver, British Columbia, Canada.
Co-organizer & Session Chair, Microfluidics Forum, ASME International Mechanical Engineering Conference & Exposition 2009, Orlando, Florida.
Proposal Reviewer, American Chemical Society

HONORS

NSF Summer Institute Fellowship	2009
Brown University Graduate Fellowship	2000 – 2001

PROFESSIONAL AFFILIATIONS

Faculty Member, SUNY Upstate Cancer Research Institute.
Member, American Society of Mechanical Engineers (ASME).
Member, Micro Nano Fluid Dynamic Technical Committee, ASME.
Member, American Society of Engineering Education (ASEE).
Member, American Physical Society (APS), Division of Fluid Dynamics.
Member, Optical Society of America (OSA).

ARCHIVAL JOURNAL AND CONFERENCE PROCEEDINGS REFEREED

Journal of Fluid Mechanics
Journal of Fluid Engineering
Microfluidics and Nanofluidics
International Journal of Heat and Mass Transfer
Optics Express
Mathematical Problems in Engineering
Journal of the Association for Laboratory Automation
Journal of Electronic Packaging
IEEE Sensors Journal
Sensors and Actuators A: Physical
Sensors and Actuators B: Chemical
Computers and Fluids
Proceedings of ASME IMECE2009
Proceedings of ASME IMECE2010
Proceedings of ASME IMECE2011
Proceedings of ASME IMECE2012
Proceedings of ASME-JSME-KSME Joint Fluids Engineering Conference 2011 (AJK2011-FED)
Proceedings of ASME ICNMM 2012
Proceedings of ASME MNHMT2012

FUNDED RESEARCH PROJECTS

- ◆ *Development of a unique experimental and computational modeling approach for studying cellular transformations related to cancer* - Binghamton University Interdisciplinary Collaboration Grant (Co-PI: Bruce Murray and Gretchen Mahler)
- ◆ *Contact Dynamics and Flow Blockage Inhibition of Armored Bubbles inside Confining Flow Conduits* - American Chemical Society Petroleum Research Fund
- ◆ *Epigenetic Characterization of Lung Cancer Progression* - Michael Connolly Endowment Fund for Lung Cancer Research (PI: Guirong Wang; Co-PI: Gretchen Mahler)
- ◆ *Collaborative Investigation of Blood Flow-Driven Waste Molecule Removal from the Brain and Its Relationship to Alzheimer's Disease* - Binghamton University Interdisciplinary Collaboration Grant (Co-PI: Paul Chiarot and David Schaffer)

GRADUATE STUDENT THESIS/DISSELTATION COMMITTEE

Wei Wang (PhD Advisor)
Mikhail Coloma (PhD Co-Advisor)
Jonathan Hui (MS Advisor)
Vadim Bromberg (PhD Committee Member)
Leo Zhang (PhD Committee Member)
Zhihang Song (PhD Committee Member)
Cheng Chen (PhD Committee Member)
Siyi Zhou (PhD '13 Committee Member)
Qingfeng Cao (MS '13, Committee Member)
Sara Mina (MS '13, PhD Committee Member)
Wenxiong Fan (MS '12, Committee Member)
Rahul Dixit (MS '11, PhD Committee Member)
Dongmyung Suh (PhD '11, Committee Member)
Gen Ou (MS '12, Committee Member)
Abe H. Lee (MS '10, Committee Member)
Vinay Dutta Jangampet (MS '10, Committee Member)

UNDERGRADUATE STUDENT RESEARCH MENTORING

Rajesh Burela (BS '16, Neuroscience)
Jarret Ealy (BS '14, Mechanical Engineering)
Raymond Wu (BS '14, Mechanical Engineering)
Vincent Mu (BS '14, Mechanical Engineering)
Jin Woo Lee (BS '14, Mechanical Engineering)
Mikhail Minevich (BS '13, Mechanical Engineering)
Jeremiah Deboever (BS '12, Mechanical Engineering)
Steven Garofalo (BS '11, MS '12, Mechanical Engineering)
Bailey Zhao (BS '11, MS '12, Mechanical Engineering)
Wing Yin Wong (BS '11, Mechanical Engineering)
Blaine Laughlin (BS '10, Mechanical Engineering)
Assadollah Tabatabaie (BS '10, Mechanical Engineering)
Austin Hsiao (BS '09, Mechanical Engineering, Tufts University)