PONG-YU (PETER) HUANG

Assistant Professor

Department of Mechanical Engineering
Binghamton University
State University of New York (SUNY)

phone: (607) 777-2071
email: **phuang@binghamton.edu**
web: www.ws.binghamton.edu/huangloft

PROFESSIONAL PREPARATION

Cornell University	B.A.	Physics, *Cum Laude*	2000
Brown University	M.S.	Engineering	2003
Brown University	Ph.D.	Engineering	2007

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
- Biomechanical dynamics of pathological cells
- Multiphase microfluidic heat transfer
- Miniaturization of biomedical devices
- Micro- and nanoscale measurement techniques
- Physiological transport phenomena

JOURNAL PUBLICATIONS

- M. Coloma, J. D. Schaffer, P. Chiarot, and P. Huang. Physiological conditions causing reverse beta-amyloid transport in cerebral pervascular basement membrane. In preparation for submission to *Journal of Theoretical Biology*, 2014.
- J. Lee and P. Huang. Effects of packing density and light angles in the efficiency of light absorption in gold nanorods. In preparation for submission to *Journal of Advanced Research*, 2014.
- W. Wang and P. Huang. Ensemble statistical algorithm for obtaining out-of-plane position distribution of tracers in evanescent wave velocimetry. In preparation for submission to *Journal of Fluid Mechancis*, 2014.
- W. Wang and P. Huang. Anisotropic mobility of particles near the interface of two immiscible liquids. *Physics of Fluids*, **26**, 092003, 2014.
- 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. Sibulkin. 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, 2014.
- 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

- J. Hui, W. Wang, and P. Huang, Thin-Film Drainage and Droplet Adhesion in a Microfluidic Channel. The 67th annual APS-DFD Meeting, Pittsburgh, PA. November 2013.
- M. A. Coloma, J. Hui, R. Carare, K. McLeod, D. Schaffer, P. R. Chiarot, and P. Huang, Fluid Mechanics of the Vascular Basement Membrane in the Brain. The 67th annual APS-DFD Meeting, Pittsburgh, PA. November 2013.
- W. Wang and P. Huang, Hindered Brownian motion of colloidal particles near a liquid-liquid interface. The 67th annual APS-DFD Meeting, Pittsburgh, PA. November 2013.
- J. Lee and P. Huang, Increasing Efficiency of Light Absorption in Solar Cells Through Gold Nanoparticle Coatings. Electronics Packaging Symposium, Binghamton University. October 2013.
- 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.

INSTRUCTIONAL HISTORY

ME 351, Fluid Mechanics	2011, 2013 - 2014
ME 441, Heat Transfer	2009 – 2014
ME 480B, Microfluidics	2012, 2014
ME 550, Introduction to Fluid Dynamics	2008, 2010
ME 540/580B, Small Scale Transport Phenomena	2009, 2013, 2015

ME 580B, Small-Scale Diagnostic Techniques in Mechanical Engineering 2011
Senior Design Projects
Fluid Mechanics Experiment for Instrumentation and Measurement Course 2009 – 2010
Height Adjustable Platform for Microfluidic Experiments 2010 – 2011
Medical Refrigerator 2011 – 2012
Optical Table Transport System 2011 – 2012
CO2 Control System for Microscope Stage-Top Incubator 2012 – 2013
ASME Relay Vehicle Competition 2012 – 2013
Flight of a Bee Exhibit Module – sponsored by the Discovery Center of the Southern Tier and BAE Systems 2013 – 2014
Wind Works: Renewable Energy and Wind Turbines – for the Discovery Center of the Southern Tier 2014 – 2015
Telecine System for 35mm Movies 2014 – 2015

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
Program Reviewer, Engineering Science Program, SUNY Broome

HONORS

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

PROFESSIONAL AFFILIATIONS

Faculty Member, SUNY Upstate Cancer Research Institute.
Faculty Member, Binghamton Biofilm Research Center.
Member, American Society of Mechanical Engineers (ASME).
Member, American Society of Engineering Education (ASEE).
Member, American Physical Society (APS), Division of Fluid Dynamics.

ARCHIVAL JOURNAL AND CONFERENCE PROCEEDINGS REFEREED

Journal of Fluid Mechanics (3x)
Journal of Fluid Engineering (4x)
Microfluidics and Nanofluidics (3x)
International Journal of Heat and Mass Transfer
Optics Express
Mathematical Problems in Engineering
Journal of the Association for Laboratory Automation (2x)

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).
- *Hidden images: revealing the three-dimensionality of film emulsion* - Material and Visual Worlds Interdisciplinary Collaboration Grants (Co-PI: Tomonari Nishikawa).
- *Endothelial to mesenchymal transformation mechanobiology* - National Science Foundation (Co-PI: Gretchen Mahler and Bruce Murray).