

ZHIXIONG (JAMES) GUO
Rutgers, The State University of New Jersey

Education

Ph.D. in Mechanical Engineering, Polytechnic University (now NYU-Poly, a.k.a. Brooklyn Poly, NY), June 3, 2001

Appointments

7/2001 – now Assistant, Associate, and Full Professor, Department of Mechanical and Aerospace Engineering, Rutgers, The State University of New Jersey – New Brunswick.

Areas of Research

- Optical and laser radiation propagation
- Laser applications in biomedicine
- Optical measurement technologies
- Radiation transfer in participating media
- Heat and mass transfer

Distinctions in Professional Activities and Honors

- Associate Editor, *ASME Journal of Heat Transfer*, since January 2013
- Associate Editor, *Heat Transfer Research*, an International Journal, since April 2011
- Guest Editors for *Heat Transfer Engineering*, *J. Enhanced Heat Transfer*, *Heat Transfer in Biomedicine*
- Fellow of American Society of Mechanical Engineers, since January 2012
- Member of OSA and SPIE
- Chair-elect, K-18 Technical Committee, HTD, ASME, 2009 – 2012, reappointed 2012-2015
- Keynote speaker, the 8th International Symposium on Heat Transfer, Oct. 21-24, 2012, Beijing, China
- Track/topic Chair in several ASME IMECE and Summer Heat Transfer Conferences
- Workshop Co-Chair, 2011 and 2013 Int. Workshop on Heat Transfer Advances for Energy Conservation and Pollution Control, Xi'an, China

Selected Articles out 75 Refereed Journal Publications (*h*-index 20 in SCI)

- B. Hunter and Z. Guo, 2012, "Phase-function normalization for accurate analysis of ultrafast collimated radiative transfer," *Appl. Opt.*, vol. 51 (12), pp. 2192-2201.
- B. Hunter and Z. Guo, 2012, "Phase-function normalization in 3-D discrete-ordinates solution of radiative transfer – Part II: Benchmark comparisons," *Numer. Heat Transfer B*, vol. 62, pp. 223-242.
- B. Hunter and Z. Guo, 2012, "Phase-function normalization in 3-D discrete-ordinates solution of radiative transfer – Part I: Conservation of scattered energy and asymmetry factor," *Numer. Heat Transfer B*, vol. 62, pp. 203-222.
- J. Jiao and Z. Guo, 2012, "Analysis of plasma-mediated ablation in aqueous tissue," *Appl. Surf. Sci.*, vol. 258 (17), pp. 6266-6271.
- M. Lin, Q.W. Wang, and Z.X. Guo, 2012, "A simple method for predicting bulk temperature from tube wall temperature with uniform outside wall heat flux," *Int. Comm. Heat Mass Transfer*, vol. 39, pp. 582-586.
- Y. Hou, Y.J. Tao, X.L. Huai, Z. Guo, 2012, "Numerical characterization of multi-nozzle spray cooling," *Appl. Thermal. Eng.*, vol. 39, pp. 163-170.

- L. Huang and Z. Guo, 2012, "Nanofiltration and sensing of picomolar chemical residues in aqueous solution using optical porous resonator in microelectrofluidic channel," *Nanotech.*, vol. 23, 065502.
- B. Hunter and Z. Guo, 2012, "Reduction of angle splitting and computational time for the finite volume method in radiative transfer analysis via phase function normalization," *Int. J. Heat Mass Transf.*, vol. 55, pp. 2449-2460.
- B. Hunter and Z. Guo, 2012, "Conservation of asymmetry factor in phase function discretization for radiative transfer analysis in anisotropic scattering media," *Int. J. Heat Mass Transf.*, vol. 55, pp. 1544-1552.
- J. Cai, X.F. Li, Y.J. Tao, F. Xin, X.L. Huai, Z. Guo, 2011, "Advances in organic liquid-gas chemical heat pumps," *Chem. Eng. Technol.*, vol. 34 (10), pp. 1603-1613.
- L. Huang and Z. Guo, 2011, "Biosensing in a microelectrofluidic system using optical whispering-gallery mode spectroscopy," *Biomicrofluidics*, vol. 5, 034114 (14pp).
- X.F. Li, X.L. Huai, J. Cai, F.Q. Zhong, X.J. Fan, and Z. Guo, 2011, "Convective heat transfer characteristics of China RP-3 aviation kerosene at supercritical pressure," *Appl. Thermal. Eng.*, vol. 31 (14-15), pp. 2360-2366.
- B. Hunter and Z. Guo, 2011, "Comparison of discrete-ordinates method and finite volume method for steady-state and ultrafast radiative transfer analysis in cylindrical coordinates," *Numer. Heat Transf. B*, vol. 59(5), pp. 339 - 359.
- M. Akamatsu and Z. Guo, 2011, "Ultrafast radiative heat transfer in three-dimensional highly-scattering media subjected to pulse train irradiation," *Numer. Heat Transf. A*, vol. 59(9), pp. 653 - 671.
- Y.J. Tao, X.L. Huai, L. Wang, Z. Guo, 2011, "Experimental characterization of heat transfer in non-boiling spray cooling with two nozzles," *Appl. Thermal Eng.*, vol. 31, pp. 1790-1797.
- J. Jiao and Z. Guo, 2011, "Modeling of ultrashort pulsed laser ablation in water and biological tissues in cylindrical coordinates," *Appl. Phys. B*, vol. 103, pp. 195-205.
- Q.L. Ma, L. Huang, Z. Guo and T. Rossmann, 2010, "Spectral shift response of optical whispering gallery modes due to water vapor adsorption and desorption," *Meas. Sci. Technol.*, vol. 21, 115206.
- Z. Guo, X.L. Wang and H. Huan, 2010, "Plasma-mediated ablation of biofilm contamination," *Appl. Surface Sci.*, vol. 257 (4), pp. 1247-1253.
- H. Huang and Z. Guo, 2010, "Ultra-short pulsed laser ablation and stripping of freeze-dried dermis," *Lasers Med. Sci.*, vol. 25(4), pp.517-524.
- Q.L. Ma, T. Rossmann and Z. Guo, 2010, "Whispering-gallery mode silica microsensors for cryogenic to room temperature measurement," *Meas. Sci. Technol.*, vol. 21, 025310 (7pp).
- X.L. Wang and Z. Guo, 2010, "Effective removal of adhering cells via ultrashort laser pulses," *Opt. Laser Technol.*, vol. 42(2), pp. 447-451.
- H. Quan and Z. Guo, 2009, "Analyses of whispering-gallery modes in small resonators," *J. Micro/Nanolith. MEMS MOEMS*, vol. 8 (3), 033060 (7pp).
- H. Huang and Z. Guo, 2009, "Human dermis separation via ultra-short pulsed laser plasma-mediated ablation," *J. Phys. D: Appl. Phys.*, vol. 42, 165204 (9pp).
- J. Jiao and Z. Guo, 2009, "Thermal interaction of short-pulsed laser focused beams with skin tissues," *Phys. Med. Biol.*, vol. 54, pp. 4225-4241.
- H. Huang and Z. Guo, 2009, "Ultra-short pulsed laser PDMS thin-layer separation and micro-fabrication," *J. Micromech. Microeng.*, vol. 19 (5), 055007 (9pp).
- Q.L. Ma, T. Rossmann and Z. Guo, 2008, "Temperature sensitivity of silica micro resonators," *Journal of Physics D: Applied Physics*, vol. 41, 245111 (6pp).
- M. Jaunich, S. Raje, K.H. Kim, K. Mitra, and Z. Guo, 2008, "Bio-heat transfer analysis during short pulse laser irradiation of tissues," *Int. J. Heat Mass Transfer*, vol. 51, pp. 5511-5521.
- H. Quan and Z. Guo, 2007, "Simulation of single transparent molecule interaction with optical microcavity," *Nanotechnology*, vol. 18, 375702 (5pp).
- K.H. Kim and Z. Guo, 2007, "Multi-time-scale heat transfer modeling of turbid tissues exposed to short pulsed irradiation," *Computer Methods and Programs in Biomedicine*, vol. 86, pp. 112-123.
- Z. Guo and S. K. Wan, 2007, "Simulated parametric studies in optical imaging of tumors through temporal log-slope difference mapping," *Med. Eng. & Phys.*, vol. 29, pp 1142-1148.
- Z. Guo and H. Quan, 2007, "Energy transfer to optical microcavities with waveguides," *J. Heat Transfer*, vol. 129 (1), pp. 44-52.
- Z. Guo, H. Quan, S. Pau, 2006, "Near-field gap effects on small microcavity whispering-gallery mode resonators," *Journal of Physics D: Applied Physics*, vol. 39, pp. 5133-5136.

- Z. Guo, H. Quan, S. Pau, 2006, "Numerical characterization of whispering-gallery mode optical microcavities," *Applied Optics*, vol. 45 (4), pp. 611-618.
- Z. Guo, S. K. Wan, D. A. August, J. Ying, S. M. Dunn, and J. L. Semmlow, 2006, "Optical imaging of breast tumor through temporal log-slope difference mappings," *Computers in Biology & Medicine*, vol. 36 (2), pp. 209 -223.
- S. K. Wan and Z. Guo, 2006, "Correlative studies in optical reflectance measurements of cerebral blood oxygenation," *JQSRT*, vol. 98 (2), pp. 189-201.
- H. Quan and Z. Guo, 2005, "Simulation of whispering-gallery-mode resonance shifts for optical miniature biosensors," *JQSRT*, vol. 93 (1-3), pp. 231 - 243.
- Z. Guo, H. Quan, and S. Pau, 2005, "Optical resonance in fabricated whispering-gallery mode microcavity," *Journal of Heat Transfer*, vol. 127 (8), p. 808 (Photogallery).
- L. Xu, X.Y. Peng, Z. Guo, J.M. Miao, and A. Asundi, 2005, "Imaging analysis of digital holography," *Optics Express*, vol. 13 (7), pp. 2444-2452.
- L. Xu, X.Y. Peng, Z. Guo, J.M. Miao, A. K. Asundi, 2004, "In-line digital microscopic holography: principles and applications in micro-metrology," *Optical Memory & Neural Networks (Information Optics)*, vol. 13 (4), pp. 163 -177.
- K.H. Kim and Z. Guo, 2004, "Ultrafast radiation heat transfer in laser tissue welding and soldering," *Numerical Heat Transfer, Part A: Applications*, vol. 46 (1), pp. 23-40.
- H. Quan and Z. Guo, 2004, "Fast 3-D optical imaging with transient fluorescence signals," *Optics Express*, vol. 12 (3), pp. 449-457.
- S. K. Wan, Z. Guo, S. Kumar, J. Aber and B. A. Garetz, 2004, "Noninvasive detection of inhomogeneities in turbid media with time-resolved log-slope analysis," *Journal of Quantitative Spectroscopy & Radiative Transfer*, vol. 84 (4), pp. 493-500.
- Z. Guo, S. K. Wan, K. H. Kim, and C. Kosaraju, 2003, "Comparing diffusion approximation with radiation transfer analysis for light transport in tissues," *Optical Review*, vol. 10 (5), pp. 415-421.
- Z. Guo and K. H. Kim, 2003, "Ultrafast-laser-radiation transfer in heterogeneous tissues with the discrete-ordinates method," *Applied Optics*, vol. 42 (16), pp. 2897-2905.
- Y. Takeuchi, S. Maruyama, S. Sakai and Z. Guo, 2002, "Improvement of computational time in radiative heat transfer of three-dimensional participating media using the radiation element method," *Journal of Quantitative Spectroscopy & Radiative Transfer*, vol. 73 (2-5), pp. 239-248.
- Z. Guo, J. Aber, B. Garetz and S. Kumar, 2002, "Monte Carlo simulation and experiments of pulsed radiative transfer," *Journal of Quantitative Spectroscopy & Radiative Transfer*, vol. 73 (2-5), pp. 159-168.
- Z. Guo and S. Kumar, 2002, "Three-dimensional discrete ordinates method in transient radiative transfer," *Journal of Thermophysics & Heat Transfer*, vol. 16 (3), pp. 289-296.
- Z. Guo and S. Maruyama, 2001, "Prediction of radiative heat transfer in industrial equipment using the radiation element method," *Journal of Pressure Vessel Technology*, vol. 123 (4), pp. 530-536.
- Z. Guo and S. Kumar, 2001, "Discrete ordinates solution of short pulse laser transport in two-dimensional turbid media," *Applied Optics*, vol. 40 (19), pp. 3156-3163.
- Z. Guo and S. Kumar, 2001, "Radiation element method for transient hyperbolic radiative transfer in plane-parallel inhomogeneous media," *Numer. Heat Transfer B*, vol. 39 (4), pp. 371 - 387.
- Z. Guo and S. Kumar, 2000, "Equivalent isotropic scattering formulation for transient radiative transfer in anisotropic scattering planar media," *Applied Optics*, vol. 39 (24), pp. 4411-4417.
- Z. Guo, S. Kumar and K.-C. San, 2000, "Multi-dimensional Monte Carlo simulation of short pulse laser radiation transport in scattering media," *J. Thermophysics Heat Transfer*, 14 (4), pp. 504 - 511.
- Z. Guo and S. Maruyama, 2000, "Radiative heat transfer in nonhomogeneous, nongray, and anisotropic scattering media," *International J. Heat Mass Transfer*, vol. 43 (13), pp. 2325-2336.
- Z. Guo, S. Maruyama and A. Komiya, 1999, "Rapid yet accurate measurement of mass diffusion coefficients by phase shifting interferometer," *Journal of Physics D*, vol. 32 (9), pp. 995-999.
- S. Maruyama and Z. Guo, 1999, "Radiative heat transfer in arbitrary configurations with nongray absorbing, emitting, and anisotropic scattering media," *J. Heat Transfer*, vol. 121 (3), pp. 722-726.
- Z. Guo and S. Maruyama, 1999, "Scaling anisotropic scattering in radiative transfer in three-dimensional nonhomogeneous media," *Int. Comm. Heat Mass Transfer*, vol. 26 (7), pp. 997-1007.
- Z. Guo, 1999, "Enhancement of heat and mass transfer in metal hydride beds with the addition of Al plates," *Heat & Mass Transfer*, vol. 34 (6), pp. 517-523.