

Qiyin Fang, Ph.D.

Canada Research Chair in Biophotonics

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Assistant Professor of Engineering Physics
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Education

- 1998-2002 Ph.D., Biomedical Physics, East Carolina University, Greenville, NC
 Dissertation: "Mechanism study of skin tissue ablation by nanosecond laser pulses"
- 1996-1998 MS., Applied Physics, East Carolina University, Greenville, NC
 Thesis: "Time-resolved measurement of transient response of water to nanosecond laser pulses at 1064 nm"
- 1991-1995 BS, Physics, Nankai University, Tianjin, China
 Thesis: "Multi-page storage in a LiNbO₃:Fe crystal sheet using the photorefractive light-climbing effect"

Working Experience

- 2005 – Assistant Professor and Canada Research Chair in Biophotonics
 Department of Engineering Physics, McMaster University, Hamilton, ON
- 2003 - 2005 Research Scientist
 Biophotonics Research & Technology Development, Minimally Invasive Surgical Technology Institute, Department of Surgery, Cedars-Sinai Medical Center, Los Angeles, CA
- 2001 - 2003 Post Doctoral Research Fellow
 Biophotonics Research & Technology Development, Minimally Invasive Surgical Technology Institute, Department of Surgery, Cedars-Sinai Medical Center
- 1996 - 2001 Research & teaching assistant
 Biomedical Laser Laboratory, East Carolina University, Greenville, NC
- 1994 - 1996 Research assistant
 Department of Physics & Center of Photonics Research, Nankai University, Tianjin, China

Honors

- 2007 Early Researcher Award, Ontario Ministry of Research and Innovation
- 2005 Canada Research Chair in Biophotonics
- 1998 APS Student Travel Award
- 1997, 1998 *River's Award*, East Carolina University
- 1992-1994 *University scholarship*, Nankai University
- 1995 *Shen Shouchun Award* in experimental physics, Nankai University

Reviewer

Biophysical Journal
 Journal of Biomedical Optics
 Journal of Investigate Dermatology
 Journal of American Society of Chemistry
 Journal of Optical Society of America
 Biosensors and Bioelectronics
 Optics Letters
 IEEE Journal of Selected Topics in Quantum Electronics
 Measurement and Sciences and Technology

Canada Research Chairs Program College of Reviewers
 Canada Foundation of Innovation
 Natural Sciences and Engineering Council of Canada
 Canadian Institutes of Health Research
 Ontario Research Fund (Ontario Ministry of Research and Innovation)
 SHARC, Shared Hierarchical Academic Research Computing Network
 Changjiang Scholar Program, Chinese Ministry of Technology
 Welcome Trust (UK)

Professional Memberships

Phi Kappa Phi and Phi Beta Delta honor societies
 American Physical Society (APS)
 The International Society for Optical Engineering (SPIE)
 The Institute of Electrical and Electronics Engineers (IEEE)
 American Society of Lasers in Medicine and Surgery (ASLMS)
 Optical Society of America (OSA)
 American Society for Photobiology (ASP)
 Chinese Optical Society (COS) (senior member)

Research Funding:**Active**

2009-2012 Strategic Project Grant, NSERC Principle
 2008-2010 Biomedical Devices Research Grant, Ontario Centers of Excellence
 2008-2010 Champions of Innovation Grant, Ontario Centers of Excellence
 2007-2012 Early Research Award, Ontario Ministry of Research Innovation
 2007-2008 CIHR Nanomedicine & Regenerative Medicine High Risk Grant
 2007-2008 Canadian Foundation of Innovation CFI-Leader's Opportunity Fund
 2007-2012 Canadian Foundation of Innovation CFI-New Initiative Fund
 2006-2008 NSERC Discovery Grant
 2005-2010 Canada Research Chair in Biophotonics

Teaching:

Engineering Physics/Medical Physics 4I03/6I03: Introduction to Biophotonics
 Engineering Physics 3G03: Optical Instrumentation
 Biomedical Engineering 701: Introduction to Biomedical Engineering (part)
 Engineering 1P03: Introduction to Professional Engineering (guest lecture)
 Engineering Physics 2S03: Engineering Physics and Emerging Technologies (guest lecture)
 Engineering Physics 3A03: Applications of Photonics
 Electrical and Computer Engineering 758: Nanotechnology
 Practical Biophotonics Summer Workshop

Undergraduate Research:

Paul Quvedo, Mike Burnett, Mike Kociolek, Nanxi Zha, Nishil Gupta, Mujtaba Ehab Mohammed, Jim Mondry, Giuseppe Brunello, Imran Deen, Scott Truong, Adriana E. Daca, Arif Deen

Graduate Research

2007 Yuan Zhang MEng. ECE
 2008 Jennifer Russell, MS/BME; Ji-Young Hwang, MS/Eng. Phys. Moussa Kfourri, MS/ECE
 Current Mowly Krishnan, MS/BME; Jin Ning, MS/BME; Roy Wang, MS/Eng. Phys., Sheu-Chi Yeh, MS/BME

Conference organization:

Organizer, the Fourth International Symposium on Integrated Optoelectronics, Honolulu, HI, 2008
 Organizer, the Fifth International Symposium on Integrated Optoelectronics, Vancouver, BC, 2010
 Session Chair, 34th meeting of American Society of Photobiology, Burlingame, CA, 2008
 Session Chair, the Third International Symposium on Integrated Optoelectronics, Cancun, Mexico, 2006

Publications:

1. Y. Yuan, J-Y. Hwang, M. Krishnamoorthy, J. Ning, Y. Zhang, K. Ye, R. C. Wang, M. J. Deen, **Q. Fang**, "A high throughput AOTF-based time-resolved fluorescence spectrometer for optical biopsy," *Optics Letters*, accepted for publication, in press, January 2009
2. Joe Lo, Shi-Jui Chen, **Qiyin Fang**, Thanassis Papaioannou, Eun-Sok Kim, Martin Gundersen and Laura Marcu, "Performance of Diaphragmed Microlens for a Packaged Microspectrometer," *Sensors*, 9: 859-868, 2009
3. Munir ElDesouki, M. Jamal Deen, **Qiyin Fang**, Louis W. C. Liu, Frances Tse and David Armstrong, "CMOS Image Sensors for High Speed Applications," *Sensors*, 9: 430-444, 2009
4. N. Faramarzpour, M. M. El-Desouki, M. J. Deen, S. Shirani, **Q. Fang**, "CMOS photodetector systems for low-level light applications," *Journal of Material Sciences: Materials in Electronics*, 20(S1): 87-93, 2009
5. L. Marcu, J. A. Jo, **Q. Fang**, T. Papaioannou, T. Reil, J-H. Qiao, J. D. Baker, J. A. Freischlag, M. C. Fishbein, "Detection of Rupture-Prone Atherosclerotic Plaques by Time-Resolved Laser Induced Fluorescence Spectroscopy," Accepted for publication, *Atherosclerosis*, published online, October, 2008.
6. Y. Yuan, T. Papaioannou, **Q. Fang**, "Single shot acquisition of time-resolved fluorescence spectra using a multiple delay optical fiber bundle," *Optics Letters*, 33(8): 791-793, 2008
7. N. Faramarzpour, M. Jamal Deen, S. Shirani and **Q. Fang**, "Fully Integrated Single Photon Avalanche Diode Detector in Standard CMOS 0.18 μ m Technology," *IEEE Transactions on Electron Devices*, Vol. 55(3): 760-767, 2008
8. J. A. Russell, K. R. Diamond, T. Collins, H. F. Tiedje, J. E. Hayward, T. J. Farrell, M. S. Patterson, **Q. Fang**, "Characterization of Fluorescence Lifetime of Photofrin and Delta-Aminolevulinic Acid Induced Protoporphyrin IX in Living Cells using Single and Two-photon Excitation," *IEEE Journal of Selected Topics in Quantum Electronics*, 14(1): 158-166, 2008
9. M. Kfourri, O. Marinov, P. Quevedo, N. Faramarzpour, S. Shirani, L. W-C. Liu, **Q. Fang**, M. J. Deen, "Towards a Miniaturized Wireless Fluorescence-Based Diagnostic Imaging System," *IEEE Journal of Selected Topics in Quantum Electronics*, 14(1): 226-234, 2008
10. N. Faramarzpour, M. M. El-Desouki, M. J. Deen, **Q. Fang**, S. Shirani and L. W-C. Liu, "CMOS Imaging for Biomedical Applications," *IEEE Potentials*, May/June, P. 31-36, 2008
11. N. Faramarzpour, M. J. Deen, S. Shirani, **Q. Fang**, L. W. C. Liu, F. Campos, and J. W. Swart, "CMOS based active pixel for low-light-level detection: analysis and measurements," *IEEE Transactions on Electron Devices*, 54(12): 3229-3237, 2007
12. J. A. Jo, L. Marcu, **Q. Fang**, T. Papaioannou, J. H. Qiao, M. C. Fishbein, B. Beseth, A. H. Dorafshar, T. Reil, D. Baker, J. Freischlag, "New Methods for Time-resolved Fluorescence Spectroscopy Data Analysis Based on the Laguerre Expansion Technique Applications in Tissue Diagnosis," *Methods of Information in Medicine*, Vol. 46(2): 206-211, 2007

13. J. F. Lo, **Q. Fang**, L. Marcu and E. S. Kim, "Wafer-level packaging of three-dimensional MOEMS device with lens diaphragm," *IEEE International Conference on Micro-Electrical-Mechanical Systems (MEMS)*, p. 715-718, 2007
14. J. A. Jo, **Q. Fang**, T. Papaioannou, J. D. Baker, A. H. Dorafshar, T. Reil, J. H. Qiao, M. C. Fishbein, J. A. Freischlag, L. Marcu; "Laguerre-based method for analysis of time-resolved fluorescence data: application to in-vivo characterization and diagnosis of atherosclerotic lesions," *Journal of Biomedical Optics*, Vol. 11 (2): 021004, 2006
15. W. H. Yong, P. V. Butte, B. K. Pikul, J. A. Jo, **Q. Fang**, T. Papaioannou, K. L. Black, and L. Marcu, "Distinction of brain tissue, low grade and high grade glioma with time-resolved fluorescence spectroscopy," *Frontiers in Biosciences*, Vol. 11: 1255-1263, 2006
16. J. A. Jo, **Q. Fang**, L. Marcu, "Ultrafast method for the analysis of fluorescence lifetime imaging microscopy data based on the Laguerre expansion technique," *IEEE Journal of Selected Topics in Quantum Electronics*, Vol. 11(4): 835-845, 2005
17. L. Marcu, **Q. Fang**, J. A. Jo, T. Papaioannou, A. Dorafshar, T. Reil, J.H. Qiao, D. Baker, J. A. Freischlag M. C. Fishbein., In-Vivo Detection of Macrophages in a Rabbit Atherosclerotic Model by Time-Resolved Laser-Induced Fluorescence Spectroscopy. *Atherosclerosis*, Vol. 181(2): 295-303, 2005.
18. **Q. Fang**, T. Papaioannou, J. Jo, R. Vaitha, K. Shastry, and L. Marcu, "Time-domain laser-induced fluorescence spectroscopy apparatus for clinical diagnostics," *Review of Scientific Instrument*, Vol. 75(1): 151-162, 2004.
19. **Q. Fang** and X. H. Hu, "Modeling of skin-tissue ablation by nanoseconds laser pulses from ultra violet to near-infrared and comparison with experimental results," *IEEE Journal of Quantum Electronics*, Vol.40(1): 69-77, 2004.
20. J. A. Jo, **Q. Fang**, T. Papaioannou, and L. Marcu, "Fast model-free deconvolution of fluorescence decay for analysis of biological systems," *Journal of Biomedical Optics*, Vol. 9(4):743-752, 2004.
21. T. Papaioannou, N. Preyer, **Q. Fang**, M. Carnohan, R. Ross, A. Brightwell, G. Cottone, L. Jones, and L. Marcu, "Effects of fiber-optic probe design and probe-to-target distance on diffuse reflectance measurements of turbid media: an experimental and computational study at 337 nm," *Applied Optics*, Vol. 43(14): 2846-2860, 2004.
22. X. H. Hu, W. A. Wooden, M. J. Cariveau, **Q. Fang**, J. F. Bradfield, G. W. Kalmus, S. J. Vore, and Y. Sun, "Tattoo Removal in Micropigs with Low-energy Pulses from a Q-switched Nd:YAG Lasers at 1064nm," *Lasers in Medical Science*, Vol.17: 154-164, 2002.
23. X. H. Hu, **Q. Y. Fang**, M. J. Cariveau,; X. N. Pan, G. W. Kalmus, "Mechanism study of porcine skin ablation by nanosecond laser pulses at 1064, 532, 266, and 213nm," *IEEE Journal of Quantum Electronics*, Vol. 37(3): 322-328, 2001.
24. **Q. Fang**, J. Xu, Q. Sun, S. Liu, G. Zhang, C. Ma, G. Zhang and G. Tian, "Multipage storage in a LiNbO₃:Fe crystal sheet using the photorefractive light-climbing effect," *Applied Optics*, Vol 35(34): 6744-6746, 1996.
25. J. Xu, **Q. Fang**, C. Ma, G. Zhang, Q. Sun, G. Zhang, S. Liu, G. Tian, Q. Wu, and X. Chen. "Light amplification in non-photorefractive doped polymer film at red light wavelength," *Chinese Physics Letters*, Vol. 14(3): 179-182, 1997.
26. Q. Sun, S. Liu, G. Y. Zhang, G. Q. Zhang, **Q. Fang**, G. Tian, "The dependence of fanning noise on beam size in LiNbO₃:Fe crystals with different thickness," *Optik*, Vol. 105(2): 74-76, 1997.
27. S. Liu, G. Zhang, G. Zhang, J. Xu, Q. Sun, and **Q. Fang**, "The study of using photorefractive spatial soliton write and store waveguide," *Physics*, Vol. 26(4): 217-220, 1997.
28. Q. Sun, J. Xu, S. Liu, G. Zhang, G. Zhang, **Q. Fang**, and G. Tian. "The inhomogeneity of two-wave coupling in photorefractive crystals in 90° geometry," *Applied Physics B*, Vol. 63: 35-38, 1996.