Min Xu

Department of Physics & Astronomy, Hunter College of CUNY
695 Park Av. Tel: 212-772-4591
New York, NY 10065 Email: minxu@hunter.cuny.edu

1 Education

Ph. D in Physics 2001, Department of Physics, The City College and Graduate Center of City University of New York
Thesis: *Optical image reconstruction in highly scattering turbid media*
Adviser: Distinguished Prof. Melvin Lax, member of National Academy of Sciences and Fellow of the American Academy of Arts and Sciences

M. S. in Physics 1995, Department of Physics, Fudan University, Shanghai, China

B. S. in Physics 1992, Department of Physics, Fudan University, Shanghai, China

2 Employment

2018-present Associate Professor of Physics (tenured), Department of Physics & Astronomy, Hunter College of the City University of New York

2010-2018 Associate Professor of Physics (tenured), Department of Physics, Fairfield University

2006-2010 Assistant Professor of Physics, Department of Physics, Fairfield University

2001-2006 Principal investigator, Institute of Ultrafast Spectroscopies and Lasers, The City College of New York

3 Research Experience

2018-present Research on Photonics/Biophysics, Department of Physics & Astronomy, Hunter College

2006-2018 Research on Biophotonics/Photonics, Department of Physics, Fairfield University

Establish a biophotonics laboratory and lead active research along the following themes (see Statement of Research for further information):
(1) Random photonics and stochastic processes;
(2) Biophotonics: biomedical optical spectroscopy, microscopy and imaging;
(3) Numerical methods and inverse problems in physical and biological sciences;

The research has been sponsored by DOD, NIH, NSF, and Research Corporations.
Collaborators: Prof. Shelley Phelan (Fairfield University), Prof. R. R. Alfano, Prof. S. K. Gayen and Dr. Alvin Katz (The City College of New York), Prof. J. A. Koutcher

(Memorial Sloan-Kettering Cancer Center), Prof. Jonathan Melamed (New York University Medical School), Prof. Yongchao Ge (Mount Sinai School of Medicine), and Prof. Jianan Qu (Hong Kong University of Science and Technology).

2001-2006 Postdoctoral Research on Laser Physics and Optical Tomography, Institute of Ultrafast Spectroscopies and Lasers, City College of New York

Principal investigator of "Time-resolved spectral optical breast tomography" funded by US Army Medical Research and Materiel Command;
Conducted a theoretical study on propagation and depolarization of multiply scattered light. Established new characteristic lengths describing the randomization of polarized light, which is fundamental to understand the interaction of polarized light with random media and optical imaging;
In collaboration with Prof. R. R. Alfano and Prof. S. K. Gayen worked on novel image reconstruction methods for optical imaging. Introduced a novel paradigm of optical imaging using Independent Component Analysis.

1995-2001 Doctoral Research on Laser Physics and Optical Tomography, Department of Physics, The City College of New York

Working with Prof. Melvin Lax conducted a theoretical study of light transport in tissues and other highly scattering random medium, inverse problems, and non-invasive imaging of highly scattering media with multiple scattering light.

1992-1995 Master Degree Research on Condensed Matter Physics and Surface Physics, T. D. Lee Physics Laboratory and Surface Physics State Key Laboratory, Fudan University, Shanghai, China

Conducted experimental work on a meta-stable phase of manganese (γ-Mn).

4 Research Interests

- Light interaction with random medium
  - Random medium photonics, radiative transfer, phenomena associated with multiple scattering light such as localization, coherent backscattering mirror
  - Numerical methods for studying complex coherent vector light propagation inside random media
  - Wavefront shaping for light propagation control in random media, light delivery techniques overcoming strong scattering
- Biomedical optical spectroscopy, microscopy and imaging
  - Fundamentals of tissue optics: analytical models for light scattering by cells and tissues and their applications in tissue diagnosis, fractals
  - Spectroscopic techniques (scattering, absorption, fluorescence, Raman and nonlinear effects) and their applications in biomedicine, optical biopsy, light scattering techniques for quantifying structure and dynamics of particle aggregation in geophysics

- Noninvasive imaging and tomography from nano- to meso-scales: novel quantitative microscopy for sub-cellular characterization, diffuse optical tomography for deep tissue imaging
- Optical methods and systems for objective cancer diagnosis and prognosis, optical pathology

- Physics in Biology and Medicine
  - Hemodynamics model
  - Physics model for the growth of cancer cells, Physics of Live Systems

- Computational physics and inverse problems in physical and biological sciences
  - Numerical methods in computational physics, Monte Carlo methods, finite element methods, FDTD methods
  - Inverse scattering problems and inverse problems in general
  - Noninvasive probing mesoscopic structure and dynamics of soft matters, remote sensing

5 Teaching and Mentoring

2018-present Associate Professor of Physics, Department of Physics & Astronomy, Hunter College

2006-2018 Assistant/Associate Professor of Physics, Department of Physics, Fairfield University

Teaching General Physics I & II, General Physics Lab I & II, Condensed Matter Physics, Modern Optics, Lab in Optics & Lasers, Physics of Light and Color, Electrodynamics I & II, Independent Studies, Capstone, and Intensive Summer Research Experience

Fall, 2016-Fall, 2017
Hosted a visiting scholar from Wenzhou Medical University, China

Fall, 2014-Spring, 2015
Hosted a visiting scholar from Wenzhou Medical University, China

2014 Curriculum development on a physics elective course "Biomedical Optics" (with Prof. Bidyut Das)

2009-2014 Supported and directed two postdoctoral scientists

2007-present Supervised Undergraduate Summer Research in Biophotonics each summer

2006-present Mentored **21** undergraduate research students at Fairfield University

2009-2013 Served as an outside member of the Supervisory Committee for **one** Ph. D candidate at the City University of New York

2006-2007 Served as an outside member of the Supervisory Committee for **two** Ph. D candidates at the City University of New York

2003-2006 Mentored **two** graduate students in the Physics department at the City College of New York

2002-2006	Adjunct Assistant Professor teaching General Physics for physics and engineering majors and premedical students at the City College of New York
Summer, 2004	Mentored high school students in the DISCOVERY program at the City College of New York

6 Professional Service

2016-present	The Optical Society of America (OSA) Traveling Lecturer
2015	Participation in drafting the International Biophotonics Community white paper titled "Label-free Optical Technologies for Biomedical Diagnostics & Imaging: Challenges and Opportunities for Clinical Transition" to make recommendations on future translational biophotonics research and development
2014-present	Served as member of Editor Board for International Journal of Radiology
2011-2014	Served as member of Editor Board for ISRN Optics
2011	Served as guest member of the editorial board of Journal of Biomedical Optics
2006-present	Reviewed grant proposals for NSF/CBET, Army Research Office, the National Medical Research Council (Singapore), Canada Research Council, PSC-CUNY, and the CUNY Collaborative Incentive Research Grant Program
1999-present	Served as referee for the American Physical Society (APS) and the Optical Society of America (OSA) journals, Physics Review E, Optics Letters, Optics Express, Applied Optics, Journal of Optical Society of America A, Journal of Biomedical Optics, Medical Physics, Inverse Problems, Applied Mathematics Letters, IEEE Journal of Selected Topics in Quantum Electronics, Applied Spectroscopy, Measurement Science and Technology, IEE Proceedings of Vision, Image & Signal Processing, and Journal of Optics A: Pure and Applied Optics.

7 University Service

2015-2018	Member, Faculty Committee on Sustainability, Fairfield University
2013-2016	Member, CAS Natural Science Merit Review Committee, Fairfield University
2013-2015	Member, Science Institute Advisory Board, Fairfield University
2014-2015	Member, Admission and Scholarships Committee, Fairfield University
2012-2014	Member, World Diversity Committee, Fairfield University
2012-2013	Member, Research Committee, Fairfield University
2009-2011	Member, Academic Council, Fairfield University
2007-2009	Member, CAS Distinguished Teaching Award Selection Committee, Fairfield University
2007-2008	Member, Physics Search Committee, Fairfield University

8 Research Grants

2017-2020 Awarded a NSF Award "RUI: Cell growth laws and quantitative microscopy for cancer aggressiveness imaging" ($238,000, PI)

2010-2015 Awarded a DOD PCRP New Investigator Award "Hyperspectral Low Coherence Enhanced Backscattering Mesoscopic Tomography for Analysis and Risk Stratification of Prostate Cancer" ($298,600, PI)

2010-2012 Awarded a Multi-investigator Cottrel College Science Award "Multimodal monitoring of oxidative stress, proliferation and cell death with light: the role of peroxiredoxins in breast cancer" ($100,000, PI: Drs. Min Xu and Shelley Phelan)

2009-2011 Awarded an AREA grant "Low Coherence Enhanced Backscattering Tomography" by National Institutes of Health ($219,396, PI)

2008-2011 Awarded an Idea Award "Development of rectal near infrared scanning polarization imaging unit and independent component analysis algorithm for prostate cancer detection" by U. S. Army Medical Research and Materiel Command ($542,960, co-PI)

2007-2009 Awarded a Cottrel College Science Award "Backscattering of partially coherent polarized light from a turbid medium" by Research Corporation ($51,908, PI)

2004-2005 Awarded a PSC-CUNY-36 research award "Optical fluorescence imaging using independent component analysis" by Research Foundation of the City University of New York

2001-2004 Awarded an award "Time-resolved spectral optical breast tomography" by U. S. Army Medical Research and Materiel Command ($150,000, PI)

1999-2000 The research on optical medical tomography received PSC-CUNY-31 research award

1998-1999 The research on optical medical tomography received PSC-CUNY-30 research award

9 Honors and Fellowships

2015-present Senior Member of OSA

2000 Dissertation Year Fellowship, the Graduate Center of City University of New York

1995-2000 Faculty Fellowship, the City College and Graduate Center of City University of New York

1993-1994 Graduate Fellowship and Guang-hua Fellowship, Fudan University

1992 *Outstanding University Graduate of Shanghai*

Nov. 1987 Winner of an Excellence prize of the 4th National Youth Physics Contest sponsored by the Society of Physics, China

Oct. 1987 Winner of an Excellence prize of the National Youth Mathematics Contest'87 sponsored by the Society of Mathematics, China

10 Memberships

The Optical Society of America (OSA), the International Society of Optical Engineering (SPIE), New York Academy of Sciences (NYAS), and the American Association for the Advancement of Science (AAAS)

11 Publications

A total of 164 publications including Book (1), Book Chapters (4), Patents (3), Journal Publications (56), Conference Proceedings (50), and Presentations (50).

11.1 Book

[1] M. Lax, W. Cai, and M. Xu. *Random Processes in Physics and Finance*. Oxford University Press, USA, 2006.

11.2 Book Chapters

[1] Min Xu, Wei Cai, and Robert R. Alfano. *Deep Tissue Imaging with Linear and Non-linear Optics*, chapter Overview of the Cumulant Solution to Light Propagation Inside a Turbid Medium and Its Applications in Deep Imaging Beyond the Diffusion Approximation. Pan Stanford Publishing Pte. Ltd., 2017.

[2] Yang Pu, Wubao Wang, Min Xu, James A. Eastham, and Robert R. Alfano. *Deep Tissue Imaging with Linear and Non-linear Optics*, chapter Deep Imaging of Prostate Cancer Using Diffusion Reconstruction of Banana Paths with Near Infrared Prostatoscope Analyzer. Pan Stanford Publishing Pte. Ltd., 2017.

[3] W. Cai and M. Xu. *Light Scattering Reviews*, volume XI, chapter Analytical solution of radiative transfer using cumulant expansion. Springer, 2016.

[4] M. Xu and A. Katz. *Light Scattering Reviews*, volume III, chapter Statistical Interpretation of Light Anomalous Diffraction by Small Particles and its Applications in Bio-agent Detection and Monitoring, pages 27–68. Springer, 2008.

11.3 Patents

[1] Min Xu. Photonic structural and chemometric pathology system. US Patent Application US62/031,387 filed on 07/31/2014.

[2] Min Xu. Low coherence enhanced backscattering tomography and techniques. US Patent No. 8,823,954.

[3] R. R. Alfano, M. Xu, M. Alrubaiee, and S. K. Gayen. Optical tomography using independent component analysis for detection and localization of targets in turbid media. US Patent Application US60/633,412 filed on 01/04/2005.

11.4 Journal Publications

[1] Xiuwei Zhu, Luyao Lu, Zili Cao, Bixin Zeng, and Min Xu. Transmission matrix-based electric field Monte Carlo study and experimental validation of the propagation characteristics of Bessel beams in turbid media. *Opt. Lett.*, 2018. (in press).

[2] Weihao Lin, Bixin Zeng, Zili Cao, Xinlin Chen, Kaiyan Yang, and Min Xu. Quantitative diagnosis of tissue microstructure with wide-field high spatial frequency domain imaging. *Biomed. Opt. Express*, 9(7):2905–2916, 2018.

[3] Al Katz, Stephanie Peña, Alexandra Alimova, Paul Gottlieb, Min Xu, and Karin A. Block. Heteroaggregation of an enveloped bacteriophage with colloidal sediments and effect on virus viability. *Sci. Total Environ.*, 637-638:104–111, 2018.

[4] Xinlin Chen, Weihao Lin, Chenge Wang, Shaoheng Chen, Jing Sheng, Bixin Zeng, and M. Xu. In vivo real-time imaging of cutaneous hemoglobin concentration, oxygen saturation, scattering properties, melanin content, and epidermal thickness with visible spatially modulated light. *Biomed. Opt. Express*, 8:5468–5482, 2017.

[5] Min Xu. Plum pudding random medium model of biological tissue toward remote microscopy from spectroscopic light scattering. *Biomed. Opt. Express*, 8:2879–2895, 2017.

[6] Zhang Xu, Michael Reilley, Run Li, and Min Xu. Mapping absolute tissue endogenous fluorophore concentrations with chemometric wide-field fluorescence microscopy. *J. Biomed. Opt.*, 22(6):066009, jun 2017.

[7] M. Xu, Zili Cao, Weihao Lin, Xinlin Chen, Longfei Zheng, and Bixin Zeng. Single snapshot multiple frequency modulated imaging of subsurface optical properties of turbid media with structured light. *AIP Advances*, 6(12):125208, 2016.

[8] I. Zeylikovich and M. Xu. Dynamic coherent backscattering mirror. *AIP Advance*, 6:025105, 2016.

[9] Min Xu. Diagnosis of the phase function of random media from light reflectance. *Sci. Rep.*, 6:22535, 2016.

[10] A. Katz, M. Xu, J.C. Steiner, A. Trusiak, A. Alimova, P. Gottlieb, and K. Block. Influence of cations on aggregation rates in mg-montmorillonite. *Clays and Clay Minerals*, 61(1):1–10, 2013.

[11] Binlin Wu, M. Alrubaiee, W. Cai, M. Xu, and S. K. Gayen. Diffuse optical imaging using decomposition methods. *International Journal of Optics*, 2012:185435, 2012.

[12] Yang Pu, Wubao Wang, Mohammad AL-Rubaiee, Swapan Kumar Gayen, and Min Xu. Determination of optical coefficients and fractal dimensional parameters of cancerous and normal prostate tissues. *Appl. Spectroscopy*, 66:828–834, 2012.

[13] Yang Pu, Wubao Wang, Min Xu, J. A. Eastham, Guicheng Tang, and Robert R. Alfano. Characterization and three-dimensional localization of cancerous prostate tissue using backscattering scanning polarization imaging and independent component analysis. *J. Biomed. Opt.*, 17:081419, 2012.

[14] Min Xu. The scattering-phase theorem: anomalous diffraction by forward-peaked scattering media. *Opt. Express*, 19:21643–21651, 2011.

[15] Min Xu, Yang Pu, and Wubao Wang. Clean image synthesis and target numerical marching for optical imaging with backscattering light. *Biomed. Opt. Express*, 2:850–857, 2011.

[16] Binlin Wu, W. Cai, M. Alrubaiee, M. Xu, and S. K. Gayen. Time reversal optical tomography: locating targets in a highly scattering turbid medium. *Opt. Express*, 19:21956–21976, 2011.

[17] Y. Pu, W. B. Wang, Min Xu, G. C. Tang, Y. Budansky, M. Sharanov, S. Achilefu, J. A. Eastham, and R. R. Alfano. Near infrared photonic finger imager for prostate cancer screening. *Technol. Cancer Res. Treat.*, 10:507–517, 2011.

[18] Alexandra Alimova, A. Katz, Julian Orozco, Hui Wei, Paul Gottlieb, Elizabeth Rudolph, J. C. Steiner, and Min Xu. Broadband light scattering measurements of the time evolution of the fractal dimension of smectite clay aggregates. *J. Opt. A*, 11:105706, 2009. (Feature Article).

[19] Min Xu. Low coherence enhanced backscattering beyond diffusion. *Opt. Lett.*, 33:1246–1248, 2008.

[20] M. Xu, Tao T. Wu, and Jianan Y. Qu. Unified Mie and fractal scattering by cells and experimental study on application in optical characterization of cellular and subcellular structures. *J. Biomed. Opt.*, 13:038802, 2008.

[21] M. Xu, M. Alrubaiee, S. K. Gayen, and R. R. Alfano. Optical diffuse imaging of an *ex vivo* model cancerous human breast using independent component analysis. *JSTQE*, 14:43–49, 2008.

[22] John Sawicki, Nikolas Kastor, and Min Xu. Electric field Monte Carlo simulation of coherent backscattering of polarized light by a turbid medium. *Opt. Express*, 16:5728–5738, 2008.

[23] Tao T. Wu, Jianan Y. Qu, and Min Xu. Unified Mie and fractal scattering by biological cells and subcellular structures. *Opt. Lett.*, 32:2324–2326, 2007.

[24] M. Xu. Superposition rule for light scattering by a composite particle. *Opt. Lett.*, 31:3223–3225, 2006.

[25] M. Alrubaiee, M. Xu, S. K. Gayen, and R. R. Alfano. Localization and cross section reconstruction of fluorescent targets in *ex vivo* breast tissue using independent component analysis. *Appl. Phys. Lett.*, 89:133902, 2006.

[26] M. Xu, M. Alrubaiee, S. K. Gayen, and R. R. Alfano. Three-dimensional localization and optical imaging of objects in turbid media using independent component analysis. *Appl. Opt.*, 44:1889–1897, 2005.

[27] M. Xu, M. Alrubaiee, S. K. Gayen, and R. R. Alfano. Optical imaging of turbid media using independent component analysis: Theory and simulation. *J. Biomed. Opt.*, 10:051705, 2005.

[28] M. Xu and R. R. Alfano. Random walk of polarized light in turbid media. *Phys. Rev. Lett.*, 95:213905, 2005.

[29] M. Xu and R. R. Alfano. Fractal mechanisms of light scattering in biological tissue and cells. *Opt. Lett.*, 30:3051–3053, 2005.

[30] M. Xu and R. R. Alfano. Circular polarization memory of light. *Phys. Rev. E*, 72:065601(R), 2005.

[31] Kevin G. Phillips, Min Xu, S. K. Gayen, and R. R. Alfano. Time-resolved ring structure of circularly polarized beams backscattered from forward scattering media. *Opt. Express*, 13:7954–7969, 2005.

[32] A. Katz, Alexandra Alimova, M. Xu, Paul Gottlieb, Elizabeth Rudolph, J. C. Steiner, and R. R. Alfano. *In Situ* determination of refractive index and size of Bacillus spores by light extinction. *Opt. Lett.*, 30:589–591, 2005.

[33] W. Cai, M. Xu, and R. R. Alfano. Analytical form of the particle distribution based on the cumulant solution of the elastic Boltzmann transport equation. *Phys. Rev. E*, 71:041202, 2005. (10 pages).

[34] M. Alrubaiee, M. Xu, S. K. Gayen, and R. R. Alfano. Tomographic imaging of scattering objects in tissue-like turbid media using independent component analysis. *Appl. Phys. Lett.*, 87:191112, 2005.

[35] M. Xu. Electric field Monte Carlo for polarized light propagation in turbid media. *Opt. Express*, 12:6530–6539, 2004.

[36] M. Xu, W. Cai, and R. R. Alfano. Multiple passages of light through an absorption inhomogeneity in optical imaging of turbid media. *Opt. Lett.*, 29:1757–1759, 2004.

[37] M. Xu. Light extinction and absorption by arbitrarily oriented finite circular cylinders using geometrical path statistics of rays. *Appl. Opt.*, 42:6710–6723, 2003.

[38] M. Xu, M. Lax, and R. R. Alfano. Light anomalous diffraction using geometrical path statistics of rays and gaussian ray approximation. *Opt. Lett*, 28:179–181, 2003.

[39] M. Xu and R. R. Alfano. More on patterns in Mie scattering. *Opt. Comm.*, 226(1-6):1–5, 2003.

[40] A. Katz, A. Alimova, M. Xu, E. Rudolph, M. Shah, H. Savage, R. Rosen, S. A. McCormick, and R. R. Alfano. Bacteria size determination by elastic light scattering. *IEEE JSTQE*, 9:277–287, 2003.

[41] W. Cai, M. Xu, and R. R. Alfano. Three dimensional radiative transfer tomography for turbid media. *IEEE JSTQE*, 9:189–198, 2003.

[42] M. Xu, W. Cai, M. Lax, and R. R. Alfano. Photon migration in turbid media using a cumulant approximation to radiative transfer. *Phys. Rev. E*, 65:066609, 2002.

[43] W. Cai, M. Xu, M. Lax, and R. R. Alfano. Diffusion coefficient depends on time not on absorption. *Opt. Lett.*, 27(9):731–733, 2002.

[44] M. Xu, M. Lax, and R. R. Alfano. Time-resolved Fourier optical diffuse tomography. *J. Opt. Soc. Am. A*, 18(7):1535–1542, 2001.

[45] M. Xu, W. Cai, M. Lax, and R. R. Alfano. A photon transport forward model for imaging in turbid media. *Opt. Lett.*, 26(14):1066–1068, 2001.

[46] W. Cai, S. K. Gayen, M. Xu, M. Zevallos, M. Alrubaiee, M. Lax, and R. R. Alfano. Optical tomographic image reconstruction from ultrafast time-sliced transmission measurements. *Appl. Opt.*, 38(19):4237–4246, 1999.

[47] X. Jin, Y. Chen, X. W. Lin, G. S. Dong, M. Xu, W. R. Zhu, X. Wang, X. L. Shen, and L. Li. Interface structure of fcc Mn on GaAs(001). *Appl. Phys. Lett.*, 70(18):2455–2457, 1997.

[48] G. S. Dong, M. Xu, Y. Chen, X. Jin, and Xun Wang. XPS study of Mn thin films grown on GaAs(001) surfaces. *Surface and Interface Analysis*, 24(9):653–656, 1996.

[49] M. Zhang, G. S. Dong, M. Xu, Y. Chen, and X. Jin. The formation of the meta-stable γ-Mn and GaAs(100) interface: diffusion and chemical reaction. *Acta Physics Sinica*, 46, 1995.

[50] X. Jin, Y. Chen, G. S. Dong, M. Zhang, M. Xu, X. G. Zhu, Xun Wang, E. D. Lu, H. B. Pan, P. S. Xu, X. Y. Zhang, and C. Y. Fan. Synchrotron-radiation study of the electronic structure of fcc Mn thin films grown on GaAs (001) surface. *Phys. Rev. B*, 51(15):9702–6, 1995.

[51] M. Zhang, G. S. Dong, X. G. Zhu, M. Xu, and X. Jin. A photoemission study on the magnetism of Mn/GaAs(100) interface. *Chinese Journal of Semiconductors*, 1994.

[52] X. Jin, M. Zhang, G. S. Dong, M. Xu, Y. Chen, Xun Wang, X. G. Zhu, and X. L. Shen. Stabilization of face-centered-cubic Mn films via epitaxial growth on GaAs(001). *Appl. Phys. Lett.*, 65(24):3078–80, 1994.

[53] X. Jin, M. Zhang, G. S. Dong, Y. Chen, M. Xu, X. G. Zhu, X. Wang, E. D. Lu, H. B. Pan, P. S. Xu, X. Y. Zhang, and C. Y. Fan. Magnetic-ordering of Mn overlayers on GaAs(100). *Phys. Rev. B*, 50(13):9585–9588, 1994.

[54] Y. Chen, G. S. Dong, M. Zhang, M. Xu, X. Jin, E. D. Lu, H. B. Fan, P. S. Xu, X. Y. Zhang, and C. Y. Fan. The growth of metastable fcc-Mn thin film on GaAs(001) and its electronic structure studied by photoemission with synchrotron radiation. *Acta Physics Sinica*, 1994.

[55] X. G. Zhu, M. Zhang, M. Xu, G. S. Dong, and X. Jin. Preparation and structural study of a new metastable Mn phase. *Chinese Journal of Semiconductors*, 14(11), 1993.

[56] M. Zhang, G. S. Dong, J. S. Li, M. Xu, X. Jin, and Xun Wang. Preparation and structural study of Mn/GaAs(100) interface. *Acta Physics Sinica*, 42(8), 1993.

11.5 Conference Proceedings

[1] Bixin Zeng, Jian Liu, Xin Chen, Wenlei Yu, Dandan Wang, Xiuwei Zhu, Weihao Lin, Yang Zheng, and Min Xu. Fermat single pixel camera for characterizing optical properties of biological tissues over the visible to SWIR spectral range. In *Optical Biopsy XVI: Toward Real-Time Spectroscopic Imaging and Diagnosis*, volume 10489 of *Proc. SPIE*, 2018.

[2] Weihao Lin, Bixin Zeng, Zili Cao, Danfeng Zhu, and M. Xu. Wide-field high spatial frequency domain imaging of tissue microstructure. In *Advanced Biomedical and Clinical Diagnostic and Surgical Guidance Systems XVI*, volume 10484 of *Proc. SPIE*, page 1048416, 2018.

[3] Yang Zheng, Xinlin Chen, Weihao Lin, Zili Cao, Xiuwei Zhu, Bixin Zeng, and M. Xu. Two dimensional microcirculation mapping with real time spatial frequency domain imaging. In *High-Speed Biomedical Imaging and Spectroscopy III: Toward Big Data Instrumentation and Management*, number 10505 in Proc. SPIE, page 105050X, 2018.

[4] Z. Cao, W. Lin, X. Chen, B. Zeng, and M. Xu. Real-time spatial frequency domain imaging by single snapshot multiple frequency demodulation technique. In *Optical Tomography and Spectroscopy of Tissue XII*, volume 10059 of *Proc. of SPIE*, page 100590Z, 2017.

[5] Run Li, Kevin Vasquez, and M Xu. Chemometric endogenous fluorescence for tissue diagnosis. In *Optical Biopsy XV: Toward Real-Time Spectroscopic Imaging and Diagnosis*, volume 10060 of *Proc. of SPIE*, page 1006017, 2017.

[6] Longfei Zheng, Shuangshuang Cai, Bixin Zeng, and Min Xu. Lung cancer diagnosis with quantitative DIC microscopy and support vector machine. In Xingde Li and Qingming Luo, editors, *International Conference on Innovative Optical Health Science*, volume 10245 of *Proc. of SPIE*, page 102450K. SPIE, 2017.

[7] Xinlin Chen, Zili Cao, Weihao Lin, Danfeng Zhu, Xiuwei Zhu, Bixin Zeng, and M. Xu. Microcirculation monitoring with real time spatial frequency domain imaging. In Xingde Li and Qingming Luo, editors, *International Conference on Innovative Optical Health Science*, volume 10245 of *Proc. of SPIE*, page 102450J, 2017.

[8] Weihao Lin, Zili Cao, Bixin Zeng, and M. Xu. Quantitative modulated imaging of turbid media in the high spatial frequency domain. In Fred S. Azar and Xavier Intes, editors, *Multimodal Biomedical Imaging XI*, volume 9701 of *Proc. of SPIE*, page 97010Y, 2016.

[9] Michael Reilly and M. Xu. Analytical model for sub-diffusive light reflection and the application to spatial frequency-domain imaging. In Bruce J. Tromberg, Arjun G. Yodh, Eva Marie Sevick-Muraca, and Robert R. Alfano, editors, *Optical Tomography and Spectroscopy of Tissue XI*, volume 9319 of *Proc. SPIE*, page 93191A, 2015.

[10] Xiuwei Zhu, Xiaolei Lin, Zili Cao, Bixin Zeng, and M. Xu. Electric field monte carlo study of coherent complex light in turbid media. In *Biomedical Applications of Light Scattering IX*, volume 9333 of *Proc. SPIE*, page 933316. SPIE, 2015. http://dx.doi.org/10.1117/12.2082605.

[11] Guichen Tang, Fanting Kong, Y.C. Chen, and M. Xu. Nuclear photothermal diffusion dynamics differentiates benign and malignant cancer. In *Biomedical Optics 2014, OSA Technical Digest (online)*, page BS5A.2. Optical Society of America, 2014. http://www.opticsinfobase.org/abstract.cfm?URI=BIOMED-2014-BS5A.2.

[12] B. Wu, S. K. Gayen, and M. Xu. Fluorescence spectroscopy using excitation and emission matrix for quantification of tissue native fluorophores and cancer diagnosis. In *Photonic Therapeutics and Diagnostics X*, volume 8926 of *Proc. SPIE*, page 1M, 2014.

[13] Guichen Tang, Fanting Kong, Y. C. Chen, and M. Xu. Full field photothermal dynamics microscopy. In *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXI*, volume 8949 of *Proceedings of SPIE*, page 89490X, 2014.

[14] Htet Aung, Bianca DeAngelo, John Soldano, Piotr Kostyk, Braulio Rodriguez, and M. Xu. On alterations in the refractive index and scattering properties of biological tissue caused by histological processing. In Adam O. Wax and Vadim Backman, editors, *Biomedical Applications of Light Scattering VII*, volume 8592 of *Proceedings of SPIE*, page 85920X. SPIE, 2013.

[15] Piotr Kostyk, Shelley Phelan, and Min Xu. Cell cycle imaging with quantitative differential interference contrast microscopy. In *Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XI*, volume 8587 of *Proceedings of SPIE*, page 85870J, 2013.

[16] A. Katz, M. Xu, A. Trusiak, P. Gottlieb, A. Alimova, J.C. Steiner, and K. Block. Aggregation rates in montmorillonite clay measured by light extinction. In *AGU Annual Meeting*, pages B53D–0703, San Francisco, 2012.

[17] A. Katz, K. Block, P. Gottlieb, A. Trusiak, A. Alimova, J.C. Steiner, and M. Xu. Effects of cation concentration on montmorillonite clay aggregation rates measured by light extinction. In *Frontiers in Optics*, page FTh2E.6, Rochester, NY, 2012. Optical Society of America.

[18] B. DeAngelo, G. Arzumanov, P. Shanley, Z. Xu, and M. Xu. Determination of the scattering coefficient, the reduced scattering coefficient, and the anisotropy factor of tissue with differential interference contrast microscopy. In Adam P. Wax and Vadim Backman, editors, *Biomedical Applications of Light Scattering VI*, volume 8230 of *Proceedings of SPIE*, page 82300I. SPIE, Bellingham, WA, 2012.

[19] H. Aung, J. Buckley, P. Kostyk, B. Rodriguez, S. Phelan, and M. Xu. Three dimensional refractive index imaging with differential interference contrast microscopy. In Jose-Angel Conchello, Carol J. Cogswell, Tony Wilson, and Thomas G. Brown, editors, *Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XIX*, volume 8227 of *Proceedings of SPIE*, page 82270G. SPIE, Bellingham, WA, 2012.

[20] Y. Pu, Wang W., Tang G., Y. Budansky, M. Sharonov, M. Xu, S. Achilefu, J. A. Eastham, and R. R. Alfano. Screening prostate cancer using a portable near infrared scanning imaging unit with an optical fiber-based rectal probe. In Robert R. Alfano and

Stavros G. Demos, editors, *Optical Biopsy X*, volume 8220 of *Proceedings of SPIE*, page 822002. SPIE, Bellingham, WA, 2012.

[21] B. Wu, W. Cai, M. Xu, and S. K. Gayen. Time-reversal optical tomography: detecting and locating extended targets in a turbid medium. In Fred S. Azar and Xavier Intes, editors, *Multimodal Biomedical Imaging VII*, volume 8216 of *Proceedings of SPIE*, page 82160K. SPIE, Bellingham, WA, 2012.

[22] Y. Pu, W. Wang, M. Alrubaiee, S. K. Gayen, and M. Xu. Systematic studies of fractal dimension parameters, absorption and scattering coefficients for cancerous and normal prostate tissues. In Hyun Wook Kang and Bodo E. Knudsen, editors, *Photonic Therapeutics and Diagnostics VIII*, volume 8207 of *Proceedings of SPIE*, page 82071H. SPIE, Bellingham, WA, 2012.

[23] M. Alrubaiee, B. Wu, M. Xu, W. Cai, J. A. Koutcher, and S. K. Gayen. Multiwavelength diffusive optical tomography using independent component analysis and time reversal algorithms. In Andreas H. Hielscher and Paola Taroni, editors, *Diffuse Optical Imaging III*, volume 8088 of *Proceedings of SPIE*, page 80880Y. SPIE, Bellingham, WA, 2011.

[24] M. Iftikhar, B. DeAngelo, G. Arzumanov, P. Shanley, Z. Xu, and M. Xu. Characterizing scattering property of random media from phase map of a thin slice: the scattering-phase theorem and the intensity propagation equation approach. In Bruce J. Tromberg, Arjun G. Yodh, Mamoru Tamura, Eva M. Sevick-Muraca, and Robert R. Alfano, editors, *Optical Tomography and Spectroscopy of Tissue IX*, volume 7896 of *Proceedings of SPIE*, page 78961O. SPIE, Bellingham, WA, 2011.

[25] Y. Pu, W. Wang, M. Xu, G. Tang, Y. Budansky, and R. R. Alfano. Three dimensional localization of cancerous prostate tissue using backscattering scanning polarization imaging and independent component analysis. In Robert R. Alfano, editor, *Optical Biopsy IX*, volume 7895 of *Proceedings of SPIE*, page 78950K. SPIE, Bellingham, WA, 2011.

[26] B. Wu, W. Cai, M. Alrubaiee, M. Xu, and S. K. Gayen. Three dimensional time reversal optical tomography. In Fred S. Azar and Xavier Intes, editors, *Multimodal Biomedical Imaging VI*, volume 7892 of *Proceedings of SPIE*, page 78920G. SPIE, Bellingham, WA, 2011.

[27] Bianca DeAngelo, Grant Arzumanov, Charles Matovu, Patrick Shanley, and M. Xu. Probing turbid medium structure using ultra low coherence enhanced backscattering spectroscopy. In Adam P. Wax and Vadim Backman, editors, *Biomedical Applications of Light Scattering IV*, volume 7375 of *Proceedings of SPIE*, page 75730X, SPIE, Bellingham, WA, 2010.

[28] M. Xu. Incoherent and coherent backscattering of light beyond diffusion for subsurface reflectance spectroscopy. In Steven L. Jacques, E. Duco Jansen, and William P. Roach, editors, *Optical Interactions with Tissue and Cells XX*, volume 7175 of *Proceedings of SPIE*, page 71751B, SPIE, Bellingham, WA, 2009.

[29] Min Xu. Coherent backscattering of polarized light for tissue diagnostics: an electric field Monte Carlo study. In Steven L. Jacques, William P. Roach, and Robert J.

Thomas, editors, *Optical Interactions with Tissue and Cells XVIIII*, 6854, page 68541A, 2008.

[30] M. Xu, Tao T. Wu, and Jianan Y. Qu. Signal sources in elastic light scattering by biological cells and tissues: what can elastic light scattering spectroscopy tell us? In Adam Wax and Vadim Backman, editors, *Biomedical Applications of Light Scattering*, volume 6864 of *Proceedings of SPIE*, page 68640Y, 2008.

[31] M. Xu, Tao T. Wu, and Jianan Y. Qu. Elastic light scattering by cells: from Mie scattering to fractal scattering. In Adam Wax and Vadim Backman, editors, *Biomedical Applications of Light Scattering*, volume 6446 of *Proceedings of SPIE*, page 64460Y, 2007.

[32] M. Xu, M. Alrubaiee, S. K. Gayen, H. Savage, and R. R. Alfano. Optical high resolution cross section imaging of a human breast model using independent component analysis. In Britton Chance, Robert R. Alfano, Bruce J. Tromberg, Mamoru Tamura, and Eva M. Sevick-Muraca, editors, *Optical Tomography and Spectroscopy of Tissue VII*, volume 6434 of *Proceedings of SPIE*, page 643416, 2007.

[33] M. Xu, M. Alrubaiee, S. K. Gayen, and R. R. Alfano. Determination of light absorption, scattering and anisotropy factor of a highly scattering medium using backscattered circularly polarized light. In Steven L. Jacques and William P. Roach, editors, *Optical Interactions with Tissue and Cells XVIII*, volume 6435 of *Proceedings of SPIE*, page 64350J, 2007.

[34] Tao T. Wu, M. Xu, and Jianan Y. Qu. Light scattering spectroscopy of cells: a study based on Mie and fractal models. In Adam Wax and Vadim Backman, editors, *Biomedical Applications of Light Scattering*, volume 6446 of *Proceedings of SPIE*, page 64460H, 2007.

[35] M. Xu, M. Alrubaiee, and R. R. Alfano. Fractal mechanism of light scattering for tissue optical biopsy. In Robert R. Alfano and Alvin Katz, editors, *Optical Biopsy VI*, volume 6091 of *Proceedings of SPIE*, page 60910E, 2006.

[36] M. Xu and R. R. Alfano. Light depolarization by tissue and phantoms. In *Optical Interactions with Tissue and Cells XVII*, volume 6084 of *Proceedings of SPIE*, page 60840T, 2006.

[37] K. G. Phillips, M. Xu, S. K. Gayen, and R. R. Alfano. Time-resolved ring structure of backscattered circularly polarized beams from forward scattering media. In *Optical Biopsy VI*, volume 6091 of *Proceedings of SPIE*, page 609109, 2006.

[38] M. Xu, M. Alrubaiee, S. K. Gayen, and R. R. Alfano. Optical tomography using independent component analysis to detect absorptive, scattering, or fluorescent inhomogeneities in turbid media. In *Optical Tomography and Spectroscopy of Tissue VII*, volume 5693 of *Proceedings of SPIE*, pages 528–535, Jan. 22-27, San Jose, California, USA, 2005.

[39] M. Xu and R. R. Alfano. Light depolarization in turbid media. In *Optical Tomography and Spectroscopy of Tissue VII*, volume 5693 of *Proceedings of SPIE*, pages 88–91, Jan. 22-27, San Jose, California, USA, 2005.

[40] M. Niebauer, A. Alimova, A. Katz, M. Xu, E. Rudolph, J. Steiner, and R. R. Alfano. Detection of biomass in new york city aerosols: Light scattering and optical fluorescence techniques. In *Eos Trans. AGU*, volume 86(52) of *Fall Meet. Suppl.*, pages B53B–03, 2005.

[41] A. Katz, A. Alimova, M. Xu, E. Rudolph, P. Gottlieb, J. C. Steiner, and R. R. Alfano. Refractive index changes during germination of bacillus subtilis spores. In *Advanced Biomedical and Clinical Diagnostic Systems III*, volume 5692 of *Proceedings of SPIE*, pages 326–329, Jan. 23-26, San Jose, California, USA, 2005.

[42] W. Cai, M. Alrubaiee, S. K. Gayen, M. Xu, and R. R. Alfano. Three-dimensional optical tomography of objects in turbid media using the round-trip matrix. In *Optical Tomography and Spectroscopy of Tissue VII*, volume 5693 of *Proceedings of SPIE*, pages 4–9, Jan. 22-27, San Jose, California, USA, 2005.

[43] M. Alrubaiee, M. Xu, S. K. Gayen, and R. R. Alfano. Fluorescence optical tomography using independent component analysis to detect small targets in turbid media. In *Optical Tomography and Spectroscopy of Tissue VII*, volume 5693 of *Proceedings of SPIE*, pages 221–224, Jan. 22-27, San Jose, California, USA, 2005.

[44] M. Alrubaiee, M. Xu, S. K. Gayen W. Cai and, and R. R. Alfano. Time-resolved and quasi-continuous wave three-dimensional tomographic imaging. In *Femtosecond Laser Applications in Biology*, volume 5463 of *Proceedings of SPIE*, pages 82–85, Palais de la Musique et des Congrès de Strasbourg, Strasbourg, France, Apr 2004. SPIE.

[45] M. Xu, W. Cai, and R. R. Alfano. Nonlinear multiple passage effects on optical imaging of an absorption inhomogeneity in turbid media. In *Photon Migration and Diffuse-light Imaging*, volume 5138 of *Proceedings of SPIE*, pages 221–230, 2003.

[46] Alvin Katz, Alexandra Alimova, Min Xu, Elizabeth Rudolph, Howard E. Savage, Mahendra Shah, Steven A. McCormick, Richard B. Rosen, and Robert R. Alfano. Identification of bacteria by light scattering. In Alexander V. Priezzhev and Gerard L. Cote, editors, *Optical Diagnostics and Sensing in Biomedicine III*, volume 4965 of *Proc. SPIE*, pages 73–76, 2003.

[47] M. Xu, S. K. Gayen, W. Cai, M. E. Zevallos, M. Lax, and R. R. Alfano. Time sliced three dimensional inverse image reconstruction of objects in highly scattering media. In *Optical Tomography and Spectroscopy of Tissue III*, volume 3597, pages 2–4. SPIE, 1999.

[48] W. Cai, S. K. Gayen, M. Xu, M. Lax, and R. R. Alfano. Inverse reconstruction of three-dimensional tomographic images of objects in turbid media from time-sliced two-dimensional transmission measurements. In James G. Fujimoto and Michael S. Patterson, editors, *Advances in Optical and Photon Migration*, volume 21 of *OSA TOPS*, pages 138–141, 1998.

[49] X. Jin, M. Zhang, G. S. Dong, X. G. Zhu, M. Xu, Y. Chen, X. L. Shen, and Xun Wang. Preparation and structural study of metastable Mn phase grown on GaAs(001) substrate. In *Mat. Res. Soc. Symp. Proc.*, volume 326, page 323, 1994.

[50] M. Zhang, M. Xu, G. S. Sheng, X. G. Zhu, X. Y. Hou, X. Jin, and X. Wang. Chemical reaction and inter-diffusion at the Mn/GaAs(100) interface. In B. Lengeler, H. Lüth, W. Mönch, and J. Pollmann, editors, *Proceedings of the 4th International Conference on the Formation of Semiconductor Interfaces*, 1993.

11.6 Presentations

A total of 50 presentations including Invited Talks (14) and Conference Presentations (36).

11.7 Invited Talks

[1] Min Xu. Harnessing scattering for bio-sensing, Jan 2015. Department of Bioengineering, Zhejiang Univ, China.

[2] Min Xu. Lighting up tumor: harnessing scattering for cancer detection and pathology, Apr 2014. Department of Bioengineering, Dartmouth College.

[3] Min Xu. Photons in disordered media: random walk and applications in cancer, Feb 2014. Department of Physics & Astrophysics, Lehman College, CUNY.

[4] Min Xu. Early detection of cancer & real-time pathology: "lighting up tumors" a new kind of pathological analysis, March 2013. Hologic inc., CT.

[5] Min Xu. Lighting up tumor: toward an optical index for malignancy, Apr 2012. School of Chemical and Biomedical Engineering, Nanyang Technological University.

[6] Min Xu. Lighting up tissue, Nov 2009. Department of Physics, Southern Connecticut State University.

[7] Min Xu. Principle and some recent progress in biomedical optics, Nov 2007. Department of Biomedical Engineering, Wenzhou Medical College, China.

[8] Min Xu. Biomedical optical imaging: principle and application in mammography, May 2007. Department of Biomedical Engineering, The City College of New York.

[9] Wei Cai, Min Xu, X. H. Ni, and Robert R. Alfano. Analytical cumulant solution of the radiative transfer equation for light scattering in turbid media, March 2006. PIERS, Cambridge.

[10] Min Xu. Toward optical imaging of small tumors in breasts using cumulant| |forward model and independent component analysis, June 2005. Era of Hope DOD BCRP Meeting Symposia Presentation.

[11] Min Xu. Random walk of vector photons in soft matter, November 2005. Department of Physics, The City College of New York.

[12] Min Xu. Optical biomedical imaging: diffusing waves and beyond, June 2005. Chance Lab, Department of biochemistry and biophysics, University of Pennsylvania.

[13] Min Xu. Optical bacteria characterization: two simple and intuitive approaches, Feberury 2005. Chance Lab, Department of biochemistry and biophysics, University of Pennsylvania.

[14] Min Xu. Diffusing waves in turbid media: imaging tissue with light, July 2005. Department of Biomedical Engineering, Texas A&M University.

11.8 Conference Presentations

[1] Run Li and M. Xu. Chemometric endogenous fluorescence for tissue diagnosis. In *Image Science Gordon Research Conference*, Stonehill College, Easton, MA, June 5-10 2016.

[2] Zili Cao, Weihao Lin, Bixin Zeng, and M. Xu. High spatial frequency modulated imaging for tissue histological evaluations. In *SPIE/NIH Biophotonics from Bench to Bedside*, National Institutes of Health, Natcher Conference Center, Bethesda, MD 20892, Sept. 24-25 2015.

[3] Michael Reilly, Kyle Scherer, Yongchao Ge, Jonathan Melamed, and M. Xu. Quantitative photonic pathology for cancer diagnosis and prognosis. In *Optical Biopsy XII*, San Francisco, CA, 2014. SPIE.

[4] Htet Aung, Bianca DeAngelo, Piotr Kostyk, Braulio Rodriguez, Jonathan Melamed, and M. Xu. Prognostic value of quantitative phase map derived by differential interference microscopy of prostate cancer tissue sections: a preliminary retrospective study. In *2012 SBUR Fall Symposium*, Miami Beach, Florida, 2012. Society for Basic Urologic Research.

[5] H. Aung, J. Buckley, P. Kostyk, B. Rodriguez, S. Phelan, and M. Xu. Imaging three-dimensional refractive index distribution with differential interference contrast (dic) microscopy. In *Focus on Microscopy 2012*, Singapore, 2012.

[6] Min Xu. Quantifying microarchitectural and light scattering differences between tumorigenic and non-tumorigenic cell models of tissue: analysis with unified Mie and fractal model. In *Biomedical Optics/Digital Holography and Three-Dimensional Imaging/Laser Applications to Chemical, Security and Environmental Analysis on CD-ROM*, page BTuF11, Optical Society of America, Washington, DC, 2008.

[7] Min Xu, Mohammad Alrubaiee, Swapan K. Gayen, and Robert R. Alfano. Optical tomography using independent component analysis. In *Era of Hope: Department of Defense Breast Cancer Research Program Meeting*, Baltimore, MD, June 25-28 2008. DOD.

[8] Swapan K. Gayen, Mohammad Alrubaiee, M. Xu, and Robert R. Alfano. Optical imaging of an ex vivo model cancerous human breast using independent component analysis. In *Era of Hope: Department of Defense Breast Cancer Research Program Meeting*, Baltimore, MD, June 25-28 2008. DOD.

[9] M. Xu, M. Alrubaiee, S. K. Gayen, and R. R. Alfano. Optical high resolution cross section imaging of a human breast model using independent component analysis. In

5th Inter-institute Workshop on Optical Diagnostic Imaging from Bench to Bedside at the National Institutes of Health, National Institutes of Health, Natcher Conference Center, Bethesda, MD 20892, Sept. 25-27 2006.

[10] M. Alrubaiee, M. Xu, S. K. Gayen, and R. R. Alfano. Time-sliced imaging and monte carlo simulation study of ex vivo cancerous and normal breast tissues. In *the Junior Scientist Conference 2006*, Vienna University of Technology, Vienna, Austria, April 19-21 2006.

[11] Min Xu, Mohammad Alrubaiee, Swapan K. Gayen, and Robert R. Alfano. Fluorescence optical imaging in turbid media using independent component analysis. In *CLEO/QELS and PhAST*, Baltimore Convention Center, Baltimore, Maryland, May 22-27 2005. OSA.

[12] Min Xu and Robert R. Alfano. Light depolarization by Mie scatterers. In *CLEO/QELS and PhAST*, Baltimore Convention Center, Baltimore, Maryland, May 22-27 2005. OSA.

[13] Alvin Katz, Alexandra Alimova, Min Xu, Paul Gottlieb, Elizabeth Rudolph, Jeff C. Steiner, and R. R. Alfano. Changes in refractive index and size of Bacillus Subtilis during activation, measured by light transmission. In *CLEO/QELS and PhAST*, Baltimore Convention Center, Baltimore, Maryland, May 22-27 2005. OSA.

[14] Wei Cai, Min Xu, and Robert R. Alfano. Light distribution from the analytical solution of the radiative transfer equation. In *CLEO/QELS and PhAST*, Baltimore Convention Center, Baltimore, Maryland, May 22-27 2005. OSA.

[15] M. Alrubaiee, M. Xu, S. K. Gayen, and R. R. Alfano. Three-dimensional localization of several scattering targets in a turbid media using independent component analysis. In *CLEO/QELS and PhAST*, Baltimore Convention Center, Baltimore, Maryland, May 22-27 2005. OSA.

[16] Min Xu and Robert R. Alfano. Fractal mechanisms of light scattering in biological tissue and cells. In *Frontiers in Optics*, Tucson, Arizona, October 16-20 2005. OSA.

[17] K. G. Phillips, M. Xu, S. K. Gayen, and R. R. Alfano. Backscattering of circularly polarized light from a forward-peaked scattering medium: an electric field Monte Carlo study. In *Einsteins in the city: a student research conference at the city college of new york*, The City College of New York, new york city, NY 10031, Apr. 11-12 2005.

[18] Min Xu, Mohammad Alrubaiee, Wei Cai, Swapan K. Gayen, and Robert R. Alfano. Toward optical imaging of small tumors in breasts using cumulant forward model and independent component analysis. In *Era of Hope: Department of Defense Breast Cancer Research Program Meeting*, Pennsylvania Convention Center, Philadelpohia, June 8-11 2005. DOD.

[19] Mohammad Alrubaiee, Min Xu, Swapan K. Gayen, and Robert R. Alfano. Optical tomography using independent component analysis for breast cancer detection. In *Era of Hope: Department of Defense Breast Cancer Research Program Meeting*, Pennsylvania Convention Center, Philadelpohia, June 8-11 2005. DOD.

[20] M. Xu, M. Alrubaiee, S. K. Gayen, and R. R. Alfano. Information theory approach to detect small inhomogeneities within tissue-like turbid media. In *4th Inter-institute Workshop on Optical Diagnostic Imaging from Bench to Bedside at the National Institutes of Health*, National Institutes of Health, Natcher Conference Center, Bethesda, MD 20892, Sept. 20-22 2004.

[21] M. Alrubaiee, M. Xu, S. K. Gayen, and R. R. Alfano. Three-dimensional localization and reconstruction of objects in a turbid medium using independent component analysis of optical transmission and fluorescence measurements. In *4th Inter-institute Workshop on Optical Diagnostic Imaging from Bench to Bedside at the National Institutes of Health*, National Institutes of Health, Natcher Conference Center, Bethesda, MD 20892, Sept. 20-22 2004.

[22] M. Xu, M. Alrubaiee, W. Cai, S. K. Gayen, and R. R. Alfano. Simulated and experimental separation and characterization of absorptive inhomogeneities embedded in turbid media. In *Biomedical Topical Meetings on CD-ROM (OSA)*, page WF25, Fontainebleau Hilton Resort and Towers, Miami Beach, Florida, Apr 2004.

[23] A. Katz, A. Alimova, M. Xu, P. Gottlieb, and R. R. Alfano. Rapid optical detection of bio-agents. In *International Conference on Advanced Technologies for Homeland Security*, Univ. Conn. Storrs, CT., Sept 25-26 2003.

[24] M. Xu, W. Cai, and R. R. Alfano. Three dimensional Hybrid-Dual-Fourier tomography in turbid media using multiple sources and multiple detectors. In *Third Inter-Institute Workshops on Diagnostic Optical Imaging and Spectroscopy: The Clinical Adventure*, National Institute of Health, Bethesda, MD, Sep. 26-27 2002.

[25] W. Cai, S. K. Gayen, M. Xu, and R. R. Alfano. Improving inverse reconstruction problem for three-dimensional optical image of breast. In *Era of Hope-Department of Defense Breast Cancer Research Program Meeting*, volume III, pages P48–1, Orange County Convention Center, Orlando, Florida, Sept. 25-28 2002.

[26] M. Alrubaiee, S. K. Gayen, W. Cai, M. Xu, J. A. Koutcher, and R. R. Alfano. Near-infrared photonic imaging of human breast tissues. In *Era of Hope-Department of Defense Breast Cancer Research Program Meeting*, volume III, pages P48–2, Orange County Convention Center, Orlando, Florida, Sept. 25-28 2002.

[27] M. Xu, W. Cai, M. Lax, and R. R. Alfano. Prior information and noise in three-dimensional optical image reconstruction. In *Advances in Optical Imaging and Photon Migration*, pages 30–32, 2002. OSA Biomedical Topical Meetings, Fontainbleau Hilton Resort and Towers, Miami Beach, Florida, April 7-10, 2002.

[28] M. Xu, M. Lax, and R. R. Alfano. Prior information and noise in three-dimensional optical image reconstruction. In *Frontier of Photonics–a Symposium to Celebrate Robert Alfano's Sixtieth Birthday*. CUNY, Nov 2001.

[29] M. Xu, W. Cai, M. Lax, and R. R. Alfano. Stochastic view of photon migration in turbid media. In *Frontier of Photonics–a Symposium to Celebrate Robert Alfano's Sixtieth Birthday*. CUNY, Nov 2001.

[30] M. Xu, M. Lax, and R. R. Alfano. Time-resolved fourier diffuse optical tomography. In *Advances in Optical Imaging and Photon Migration*, volume 38 of *OSA TOPS Biomedical Topical Meetings*, pages 345–347, 2000.

[31] M. Xu, M. Lax, and R. R. Alfano. Time resolved optical diffuse tomography. In *CCAPP Annual Poster Presentation*. The City College of New York, Nov. 2000.

[32] W. Cai, S. K. Gayen, M. Xu, M. Lax, and R. R. Alfano. Three-dimensional inverse image reconstruction using picosecond time-sliced two-dimensional near-infrared transmission measurements. In *the OSA Annual Meeting*, page ThUU6, Baltimore, MD, October 4-9 1998.

[33] W. Cai, S. K. Gayen, M. Xu, M. Lax, and R. R. Alfano. Inverse reconstruction of three-dimensional optical tomographic images of objects in turbid media from time-sliced two- dimensional transmission measurements. In *the Advances in Optical Imaging and Photon Migration 1998 Conference*, page PDA2, Orlando, Florida, March 8-11 1998.

[34] M. Zhang, M. Xu, G. S. Dong, X. Jin, and X. Wang. Preparation and structural study of metastable phase Mn grown on GaAs(100) substrate. In *MRS Fall Meeting*, 1993.

[35] M. Xu, M. Zhang, X. G. Zhu, G. S. Dong, X. Jin, and Xun Wang. An XPS study of γ-Mn/GaAs(100). In *The 9th National Conference on Physics of Semiconductors*, 1993.

[36] X. Jin, M. Zhang, G. S. Sheng, M. Xu, Z. S. Li, X. Wang, X. G. Zhu, and X. L. Shen. Metastable phase of mangnese on GaAs(100) surface. In *ICSOS-4*, 1993.