

Rongguang Liang
College of Optical Sciences
University of Arizona
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EDUCATION

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|------|--|-------------------------------|
| 2001 | The University of Arizona, Tucson, AZ
Dissertation: Measurement of optical phase and polarization in the media
and systems of optical data storage
Supervisor: Prof. Masud Mansuripur | PhD in Optical Sciences |
| 1998 | Rose-Hulman Institute of Technology, Terre Haute, IN
Thesis: Phase Unwrapping by Neural Network
Supervisor: Prof. Michael F. McInerney | MS in Applied Optics |
| 1989 | Zhejiang University, Hangzhou, P. R. China | BS in Optical Instrumentation |

PROFESSIONAL EXPERIENCE

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|----------------|---|--|
| 2011 - Present | The University of Arizona, Tucson, AZ
College of Optical Sciences
Professor/Associate Professor | |
| 2007 – 2011 | Carestream Health Inc (former Eastman Kodak Company's Health Group)
Research and Innovation Laboratories
Senior Principal Research Scientist / Project Leader | |
| 2001 – 2007 | Eastman Kodak Co., Rochester, NY
Medical Science and Technology Center, Research & Development Lab
Principal Research Scientist / Project Leader
Engineering Physics Lab, Research & Development Laboratories
Senior Research Scientist | |
| 1998 – 2001 | The University of Arizona, Tucson, AZ
Graduate Research Assistant / Graduate Research Associate | |
| 1989 – 1996 | Micro-optic Industrial Group Co. (now Motic Inc), Xiamen, P. R. China
Optics Engineer, Research & Development Department | |

HONORS and AWARDS

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|------|--|
| 2019 | Optical Society of America, Fellow |
| 2017 | RHG Exceptional Achievement for Engineering Team
National Aeronautics and Space Administration (NASA) |
| 2015 | Group Achievement Award,
National Aeronautics and Space Administration (NASA) |
| 2010 | SPIE, Fellow |

SERVICE/OUTREACH

External Service

2015	National Technology Roadmap for Photonics (NTRP) (Co-team leader, Biophotonics)
2015	SPIE Fellowship Committee
2013, 2014	OSA Paul F. Forman Engineering Excellence Award, Committee/Chair

Editorial Service

2018 – 2019	Scientific Reports, Editorial Board
2015 – 2021	<i>Optica</i> , Associate Editor
2008 – 2014	<i>Applied Optics</i> , Topical Editor
2007 – 2010	OPN of Optical Society of America, Editorial Advisory Committee
2014	Joint feature issue on lithography, <i>JOSA A and Applied Optics</i> , Guest Editor
2014	Special Section on High-Speed 3-D Optical Metrology and Applications, <i>Optical Engineering</i> , Guest Editor
2012	Feature issue on Applied Industrial Optics, <i>Applied Optics</i> , Guest Editor
2013	Feature issue on Bio-optics: Design and Application <i>Biomedical Optics Express</i> , Guest Editor

Review Panels

2019	NIH ZRG1 N53(1)
2019	NIH ZRG1 SBIB-Q (11)
2019	NIH ZRG1-SBIB-Q(57)
2018	NIH ZRG1-SBIB-Q(57)
2018	NIH ODCS
2018	NIH BMIT-A
2018	NSF MME (P181628)
2017	NIH ODCS
2017	NIH ZRG1-SBIB-G(11)
2016	NSF Photonics panel (P161649)
2012 – 2017	NIH ZRG1 SBIB-Q (11)
2014, 2015	NIH BRAIN: Technologies for Large - Scale Recording, ZNS1 SRB-G (77)
2014, 2015	NIH National Heart, Lung, and Blood Institute Special Emphasis Panel ZHL1 CSR-B(M1)
2014, 2015	NIH Clinical pediatric study section ZRG1 SBIB-V (82)
2012, 2013	NIH Enabling Bioanalytical and Imaging Technologies Study Section (EBIT)
2013	NIH Translational Special Emphasis Panel (DTCS)
2013	NIH/NHLBI Study Section on Small Business Innovation Research (SBIR) #73

Conference chair

2008 – 2019	Design and Quality of Biomedical Technologies (SPIE)
2014, 2015	Frontier in Optics, FiO.1 (OSA)
2011, 2013	Bio-Optics: Design and Application (OSA)
2012, 2014, 2016	The Nature of Light: Light in Nature (SPIE)

Conference committee / session chair

2016	10th International Conference on Optics-photonics Design and Fabrication
2012-2016	Design and Performance Validation of Phantoms Used in Conjunction with Optical Measurement of Tissue (SPIE)
2015	Bio-Optics: Design and Application (OSA)
2010, 2014	International Optical Design Conference (SPIE and OSA)
2010-2013	Frontier in Optics, FiO.1 (OSA)
2012, 2013	Solid State and Organic Lighting (SOLED) (OSA)
2007-2012	Novel Optical System Design and Optimization (SPIE)

EXPERT WITNESS CASE

1. Largan vs. HP and Newmax: Mobile optics
2. Thermo Fisher Scientific Inc vs. Bio-Rad Laboratories Inc: Biomedical imaging technology
3. Align Technology vs. 3Shape A/S: 3D imaging technology

PUBLICATIONS/CREATIVE ACTIVITY

Books

1. Rongguang Liang (editor), *Biomedical Optical Imaging Technologies: Design and Applications*, Springer Press (2012)
2. Rongguang Liang, *Optical Design for Biomedical Imaging*, SPIE Press (2011)

Book chapters

1. Shaun Pacheco, Zhenyue Chen, and Rongguang Liang, *Optics of Biomedical Instrumentation* in Handbook of Optical Engineering (2nd edition, edited by Daniel Malacara) (Marcel Dekker, 2016).
2. Wang, Daodang, and Rongguang Liang. "Point Diffraction Interferometry." In *Optical Interferometry*. InTech, 2017.

Journal Papers

1. Shaobai Li, Bofan Song, Tyler Peterson, Jian Hsu, and Rongguang Liang, "MicroLED chromatic confocal microscope," *Opt. Lett.* **46**, 2722-2725 (2021).
2. Cheng, Weibo, Jan-Willem Pieterse, and Rongguang Liang. "Damage Inside Borosilicate Glass by a Single Picosecond Laser Pulse." *Micromachines* 12, no. 5 (2021): 553.
3. Hanting Gu, Daodang Wang, Zhixiong Gu, Ming Kong, Lu Liu, Lihua Lei, and Rongguang Liang, "High-accuracy deflectometric microscope system with a large slope range," *Opt. Lett.* **46**, 2011-2014 (2021).
4. Khreishi, Manal, Raymond G. Ohl, Joseph M. Howard, Jonathan C. Papa, Ryan McClelland, Clark Hovis, Theodore Hadjimichael et al. "Enabling precision coordinate metrology for universal optical testing and alignment applications." *Optical Engineering* 60, no. 3 (2021): 035106.
5. Kang, Wenjun, Zhihan Hong, and Rongguang Liang. "3D printing optics with hybrid material." *Applied Optics* 60, no. 7 (2021): 1809-1813.

6. Wang, Daodang, Yamei Yin, Jinchao Dou, Ming Kong, Xinke Xu, Lihua Lei, and Rongguang Liang. "Calibration of geometrical aberration in transmitted wavefront testing of refractive optics with deflectometry." *Applied Optics* 60, no. 7 (2021): 1973-1981.
7. Yingying Zhang, Rongguang Liang, Oliver Joshua Spires, Shaohui Yin, Allen Yi, and Tom D. Milster, "Precision glass molding of diffractive optical elements with high surface quality," *Opt. Lett.* 45, 6438-6441 (2020)
8. Park, Jongchan, Xiaohua Feng, Rongguang Liang, and Liang Gao. "Snapshot multidimensional photography through active optical mapping." *Nature communications* 11, no. 1 (2020): 1-13.
9. Junchao Zhang, Yuanyuan Sun, Jianlai Chen, Degui Yang, and Rongguang Liang, "Deep-learning-based hyperspectral recovery from a single RGB image," *Opt. Lett.* 45, 5676-5679 (2020)
10. Daodang Wang, Ping Xu, Zhendong Wu, Xiangyu Fu, Rengmao Wu, Ming Kong, Jian Liang, Bo Zhang, and Rongguang Liang, "Simultaneous multisurface measurement of freeform refractive optics based on computer-aided deflectometry," *Optica* 7, 1056-1064 (2020).
11. Zhang, Junchao, Jianbo Shao, Jianlai Chen, Degui Yang, Buge Liang, and Rongguang Liang. "PFNet: an unsupervised deep network for polarization image fusion." *Optics letters* 45, no. 6 (2020): 1507-1510.
12. Tian, Xiaobo, and Rongguang Liang. "Snapshot phase-shifting diffraction phase microscope." *Optics Letters* 45, no. 12 (2020): 3208-3211.
13. Liang, Jian, Junchao Zhang, Jianbo Shao, Bofan Song, Baoli Yao, and Rongguang Liang. "Deep Convolutional Neural Network Phase Unwrapping for Fringe Projection 3D Imaging." *Sensors* 20, no. 13 (2020): 3691.
14. Zhang, Yu, Xiaobo Tian, and Rongguang Liang. "Phase extraction from two randomly phase shifted interferograms by combining advanced principal component analysis and Lissajous ellipse fitting." *Optics and Lasers in Engineering* 132 (2020): 106134.
15. Wang, Daodang, Xiangyu Fu, Ping Xu, Xiaobo Tian, Oliver Spires, Jian Liang, Heng Wu, and Rongguang Liang. "Compact snapshot dual-mode interferometric system for on-machine measurement." *Optics and Lasers in Engineering* 132 (2020): 106129.
16. Wu, Heng, Genping Zhao, Ruizhou Wang, Huapan Xiao, Daodang Wang, Jian Liang, Lianglun Cheng, and Rongguang Liang. "Computational ghost imaging system with 4-connected-region-optimized Hadamard pattern sequence." *Optics and Lasers in Engineering* 132 (2020): 106105.
17. Li, Ziqiang, Xinyang Li, and Rongguang Liang. "Random two-frame interferometry based on deep learning." *Optics Express* 28, no. 17 (2020): 24747-24760.
18. Li, Zongxuan, Zhihan Hong, Yue Xiao, Qing Hao, and Rongguang Liang. "Thermal Effects in Single-Point Curing Process for Pulsed Infrared Laser-Assisted 3D Printing of Optics." *3D Printing and Additive Manufacturing* 7, no. 4 (2020): 151-161.
19. Gannon, Caleb, and Rongguang Liang. "Evolving expertise for automated lens optimization." *Applied Optics* 59, no. 22 (2020): G129-G136.
20. Liang, Jian, Xiaobo Tian, Xingzhou Tu, Oliver Spires, Neal Brock, Daodang Wang, Heng Wu et al. "Color full stokes polarization fringe projection 3D imaging." *Optics and Lasers in Engineering* 130 (2020): 106088.
21. Uthoff, Ross D., Bofan Song, Melody Maarouf, Vivian Y. Shi, and Rongguang Liang. "Point-of-care, multispectral, smartphone-based dermoscopes for dermal lesion screening and erythema monitoring." *Journal of biomedical optics* 25, no. 6 (2020): 066004.
22. Zhang, Yu, Xiaobo Tian, and Rongguang Liang. "SPGD and Newton iteration mixed algorithm used in freeform surface metrology." *Optics and Lasers in Engineering* 129 (2020): 106050.

23. Li, Shaobai, and Rongguang Liang. "DMD-based three-dimensional chromatic confocal microscopy." *Applied optics* 59, no. 14 (2020): 4349-4356.
24. Wang, Daodang, Chao Wang, Xiaobo Tian, Heng Wu, Jian Liang, and Rongguang Liang. "Snapshot phase-shifting lateral shearing interferometer." *Optics and Lasers in Engineering* 128 (2020): 106032.
25. Ding, Zhanghao, Lin Yang, Rengmao Wu, Zhenrong Zheng, Min Wang, Ping Zeng, Fei Wu, Yong Li, and Rongguang Liang. "Designing compact and ultra-efficient illumination lenses with prescribed irradiance properties for extended light sources." *Optics Communications* (2020): 125601.
26. Zhang, Yingying, Shaohui Yin, Rongguang Liang, Hong Luo, Huapan Xiao, and Ningxiao Yuan. "New testing and calculation method for determination viscoelasticity of optical glass." *Optics Express* 28, no. 1 (2020): 626-640.
27. Liang, Jian, Haijuan Ju, Liyong Ren, Liming Yang, and Rongguang Liang. "Generalized polarimetric dehazing method based on low-pass filtering in frequency domain." *Sensors* 20, no. 6 (2020): 1729.
28. Apai, D., T. D. Milster, D. Kim, A. Bixel, G. Schneider, B. V. Rackham, R. Liang, and J. Arenberg. "Nautilus: A Biosignature Survey in a Thousand Exo-Earths." *AAS* (2020): 212-06.
29. Yufeng Yan, Xiaobo Tian, Rongguang Liang, and Jose Sasian, "Optical performance evaluation and chromatic aberration correction of a focus tunable lens used for 3D microscopy," *Biomed. Opt. Express* **10**, 6029-6042 (2019).
30. Ross D. Uthoff, Bofan Song, Sumsum Sunny, Sanjana Patrick, Amritha Suresh, Trupti Kolur, Keerthi Gurushanth, Kimberly Wooten, Vishal Gupta, Mary E. Platek, Anurag K. Singh, Petra Wilder-Smith, Moni Abraham Kuriakose, Praveen Birur, and Rongguang Liang "Small form factor, flexible, dual-modality handheld probe for smartphone-based, point-of-care oral and oropharyngeal cancer screening," *Journal of Biomedical Optics* 24(10), 106003 (22 October 2019).
31. Daodang Wang, Xiaobo Tian, Ping Xu, Jian Liang, Heng Wu, Oliver Spires, and Rongguang Liang, "Compact snapshot multiwavelength interferometer," *Opt. Lett.* **44**, 4463-4466 (2019).
32. Jian Liang, Xiaobo Tian, Haijuan Ju, Daodang Wang, Heng Wu, Liyong Ren, and Rongguang Liang, "Reconfigurable snapshot polarimetric imaging technique through spectral-polarization filtering," *Opt. Lett.* **44**, 4574-4577 (2019).
33. Huapan Xiao, Rongguang Liang, Oliver Spires, Hairong Wang, Heng Wu, and YingYing Zhang, "Evaluation of surface and subsurface damages for diamond turning of ZnSe crystal," *Opt. Express* **27**, 28364-28382 (2019).
34. Junchao Zhang, Xiaobo Tian, Jianbo Shao, Haibo Luo, and Rongguang Liang, "Phase unwrapping in optical metrology via denoised and convolutional segmentation networks," *Opt. Express* **27**, 14903-14912 (2019).
35. Jianbo Shao, Junchao Zhang, Rongguang Liang, and Kobus Barnard, "Fiber bundle imaging resolution enhancement using deep learning," *Opt. Express* **27**, 15880-15890 (2019).
36. Shao, Jianbo, Junchao Zhang, Xiao Huang, Rongguang Liang, and Kobus Barnard. "Fiber bundle image restoration using deep learning." *Optics letters* 44, no. 5 (2019): 1080-1083.
37. Mu, Tingkui, Feng Han, Donghao Bao, Chunmin Zhang, and Rongguang Liang. "Compact snapshot optically replicating and remapping imaging spectrometer (ORRIS) using a focal plane continuous variable filter." *Optics letters* 44, no. 5 (2019): 1281-1284.

38. Jian Liang, Haijuan Ju, Liyong Ren, Wenfei Zhang, Liming Yang, Zhaofeng Bai, and Rongguang Liang, "High-resolution reconstruction of shortwave infrared polarimetric images using the intensity information of visible images," *Appl. Opt.* **58**, 4866-4870 (2019).
39. Xiao, Huapan, Hairong Wang, Na Yu, Rongguang Liang, Zhe Tong, Zhi Chen, and Jiuhong Wang. "Evaluation of fixed abrasive diamond wire sawing induced subsurface damage of solar silicon wafers." *Journal of Materials Processing Technology* (2019): 116267.
40. Yu Zhang, Xiaobo Tian, and Rongguang Liang, "Accurate and fast two-step phase shifting algorithm based on principle component analysis and Lissajous ellipse fitting with random phase shift and no pre-filtering," *Opt. Express* **27**, 20047-20063 (2019).
41. Cui, Qi, and Rongguang Liang. "Chromatic confocal microscopy using liquid crystal display panels." *Applied optics* **58**, no. 8 (2019): 2085-2090.
42. Zhang, Yu, Xiaobo Tian, and Rongguang Liang. "Random three-step phase retrieval approach based on difference map Gram-Schmidt orthonormalization and Lissajous ellipse fitting method." *Optics and Lasers in Engineering* **121** (2019): 11-17.
43. Zhang, Yu, Xiaobo Tian, and Rongguang Liang. "Timesaving phase retrieval approach based on difference map normalization and fast iterative algorithm." *Optics and Lasers in Engineering* **121** (2019): 18-28.
44. Xiaobo Tian, Xingzhou Tu, Kimiko Della Croce, Guang Yao, Haijiang Cai, Neal Brock, Stanley Pau, and Rongguang Liang, "Multi-wavelength quantitative polarization and phase microscope," *Biomed. Opt. Express* **10**, 1638-1648 (2019).
45. Gannon, Caleb, and Rongguang Liang. "Curl-free ray mapping in three dimensions for freeform illumination design." *Optical Engineering* **58**, no. 2 (2019): 025102.
46. Xiaobo Tian, Yu Zhang, Alexander Sohn, Oliver J. Spire, and Rongguang Liang "Dual-mode snapshot interferometric system for on-machine metrology," *Optical Engineering* **58**(4), 044104 (30 April 2019).
47. Zhang, Yu, Xiaobo Tian, and Rongguang Liang. "Two-step random phase retrieval approach based on Gram-Schmidt orthonormalization and Lissajous ellipse fitting method." *Optics Express* **27**, no. 3 (2019): 2575-2588.
48. Zhang, Junchao, Jianbo Shao, Haibo Luo, Xiangyue Zhang, Bin Hui, Zheng Chang, and Rongguang Liang. "Learning a convolutional demosaicing network for microgrid polarimeter imagery." *Optics letters* **43**, no. 18 (2018): 4534-4537.
49. Gannon, Caleb, and Rongguang Liang. "Using spherical harmonics to describe large-angle freeform lenses." *Applied optics* **57**, no. 28 (2018): 8143-8147.
50. Zhang, Yu, Xiaobo Tian, and Rongguang Liang. "Three-step random phase retrieval approach based on difference map normalization and diamond diagonal vector normalization." *Optics express* **26**, no. 22 (2018): 29170-29182.
51. Song, Bofan, Sumsum Sunny, Ross D. Uthoff, Sanjana Patrick, Amritha Suresh, Trupti Kolur, G. Keerthi et al. "Automatic classification of dual-modality, smartphone-based oral dysplasia and malignancy images using deep learning." *Biomedical optics express* **9**, no. 11 (2018): 5318-5329.
52. Uthoff, Ross D., Bofan Song, Sumsum Sunny, Sanjana Patrick, Amritha Suresh, Trupti Kolur, G. Keerthi et al. "Point-of-care, smartphone-based, dual-modality, dual-view, oral cancer screening device with neural network classification for low-resource communities." *PloS one* **13**, no. 12 (2018): e0207493.

53. Aftab, Maham, Heejoo Choi, Rongguang Liang, and Dae Wook Kim. "Adaptive Shack-Hartmann wavefront sensor accommodating large wavefront variations." *Optics express* **26**, no. 26 (2018): 34428-34441.
54. Wu, Rengmao, Zexin Feng, Zhenrong Zheng, Rongguang Liang, Pablo Benítez, Juan C. Miñano, and Fabian Duerr. "Design of Freeform Illumination Optics." *Laser & Photonics Reviews* (2018): 1700310.
55. Yu Zhang, Xiaobo Tian, and Rongguang Liang, "Random two-step phase shifting interferometry based on Lissajous ellipse fitting and least squares technologies," *Opt. Express* **26**, 15059-15071 (2018).
56. Xiaobo Tian, Xingzhou Tu, Junchao Zhang, Oliver Spires, Neal Brock, Stanley Pau, and Rongguang Liang, "Snapshot multi-wavelength interference microscope," *Opt. Express* **26**, 18279-18291 (2018).
57. Junchao Zhang, Haibo Luo, Rongguang Liang, Ashfaq Ahmed, Xiangyue Zhang, Bin Hui, and Zheng Chang, "Sparse representation-based demosaicing method for microgrid polarimeter imagery," *Opt. Lett.* **43**, 3265-3268 (2018).
58. Jianbo Shao, Wei-Chen Liao, Rongguang Liang, and Kobus Barnard, "Resolution enhancement for fiber bundle imaging using maximum a posteriori estimation," *Opt. Lett.* **43**, 1906-1909 (2018).
59. Gannon, Caleb, and Rongguang Liang. "Optimal geometry for off-axis, freeform illumination design." *Optical Engineering* **57**, no. 6 (2018): 065102.
60. Daodang Wang, Zhidong Gong, Ping Xu, Chao Wang, Rongguang Liang, Ming Kong, and Jun Zhao, "Accurate calibration of geometrical error in reflective surface testing based on reverse Hartmann test," *Opt. Express* **26**, 8113-8124 (2018).
61. Missael Garcia, Christopher Edmiston, Timothy York, Radoslav Marinov, Suman Mondal, Nan Zhu, Gail P. Sudlow, Walter J. Akers, Julie Margenthaler, Samuel Achilefu, Rongguang Liang, Mohamed A. Zayed, Marta Y. Pepino, and Viktor Gruev, "Bio-inspired imager improves sensitivity in near-infrared fluorescence image-guided surgery," *Optica* **5**, 413-422 (2018).
62. Zhengbo Zhu, Donglin Ma, Qiaomu Hu, Yongqian Tang, and Rongguang Liang, "Catadioptric freeform optical system design for LED off-axis road illumination applications," *Opt. Express* **26**, A54-A65 (2018).
63. Wang, Daodang, Ping Xu, Zhidong Gong, Zhongmin Xie, Rongguang Liang, Xinke Xu, Ming Kong, and Jun Zhao. "Transmitted wavefront testing with large dynamic range based on computer-aided deflectometry." *Journal of Optics* **20**, no. 6 (2018): 065705.
64. Wang, Daodang, Ping Xu, Zhidong Gong, Zhongmin Xie, Rongguang Liang, Xinke Xu, Ming Kong, and Jun Zhao. "Transmitted wavefront testing with large dynamic range based on computer-aided deflectometry." *Journal of Optics* **20**, no. 6 (2018): 065705.
65. Xingzhou Tu, Oliver J. Spires, Xiaobo Tian, Neal Brock, Rongguang Liang, and Stanley Pau, "Division of amplitude RGB full-Stokes camera using micro-polarizer arrays," *Opt. Express* **25**, 33160-33175 (2017).
66. Zhihan Hong and Rongguang Liang, "IR-laser assisted additive freeform optics manufacturing," *Scientific Reports* **7**, 7145, DOI:10.1038/s41598-017-07446-8 (2017).
67. Yu Zhang, Xiaobo Tian, and Rongguang Liang, "Fringe-print-through error analysis and correction in snapshot phase-shifting interference microscope," *Opt. Express* **25**, 26554-26566 (2017).

68. Yiwei He, Lei Huang, Xi Hou, Wu Fan, and Rongguang Liang, "Modeling near-null testing method of a freeform surface with a deformable mirror compensator," *Appl. Opt.* **56**, 9132-9138 (2017).
69. Yiwei He, Xi Hou, Fan Wu, Xinxue Ma, and Rongguang Liang, "Analysis of spurious diffraction orders of computer-generated hologram in symmetric aspheric metrology," *Opt. Express* **25**, 20556-20572 (2017).
70. Zexin Feng, Brittany D. Froese, Rongguang Liang, Dewen Cheng, and Yongtian Wang, "Simplified freeform optics design for complicated laser beam shaping," *Appl. Opt.* **56**, 9308-9314 (2017).
71. Pacheco, Shaun, Chengliang Wang, Monica K. Chawla, Minhkhoei Nguyen, Brend K. Baggett, Urs Utzinger, Carol A. Barnes, and Rongguang Liang. "High resolution, high speed, long working distance, large field of view confocal fluorescence microscope." *Scientific reports* 7, no. 1 (2017): 13349.
72. Yujie Luo, Xiao Huang, Jian Bai, and Rongguang Liang, "Compact polarization-based dual-view panoramic lens," *Appl. Opt.* **56**, 6283-6287 (2017).
73. Wang, Zhichao, Daodang Wang, Zhidong Gong, Ping Xu, Rongguang Liang, Jufeng Zhao, and Wei Li. "Measurement of absolute displacement based on dual-path submicron-aperture fiber point-diffraction interferometer." *Optik-International Journal for Light and Electron Optics* 140, 802-811 (2017).
74. Yu Zhang, Hsiang-Nan Cheng, Rengmao Wu, and Rongguang Liang, "Data processing for point-based in situ metrology of freeform optical surface," *Opt. Express* **25**, 13414-13424 (2017).
75. Chih-Yu Huang and Rongguang Liang, "Modeling of surface topography on diamond-turned spherical and freeform surfaces," *Appl. Opt.* **56**, 4466-4473 (2017).
76. Caleb Gannon and Rongguang Liang, "Ray mapping with surface information for freeform illumination design," *Opt. Express* **25**, 9426-9434 (2017).
77. Salahieh, Basel, Jeffrey J. Rodriguez, Sean Stetson, and Rongguang Liang. "Single-image full-focus reconstruction using depth-based deconvolution." *Optical Engineering* 56, no. 4, 041302-041302 (2017).
78. Rengmao Wu, José Sasián, and Rongguang Liang, "Algorithm for designing free-form imaging optics with nonrational B-spline surfaces," *Appl. Opt.* **56**, 2517-2522 (2017).
79. Mondal, Suman B., Shengkui Gao, Nan Zhu, LeMoyne Habimana-Griffin, Walter J. Akers, Rongguang Liang, Viktor Gruev, Julie Margenthaler, and Samuel Achilefu. "Optical See-Through Cancer Vision Goggles Enable Direct Patient Visualization and Real-Time Fluorescence-Guided Oncologic Surgery." *Annals of Surgical Oncology*, 1-7. (2017).
80. Junchao Zhang, Haibo Luo, Rongguang Liang, Wei Zhou, Bin Hui, and Zheng Chang, "PCA-based denoising method for division of focal plane polarimeters," *Opt. Express* **25**, 2391-2400 (2017).
81. Zhengbo Zhu, Xiuhua Yuan, Rongguang Liang, and Donglin Ma, "Free-form surface generation in a double pole coordinate system for off-axis illumination application," *Appl. Opt.* **56**, 771-776 (2017).
82. Mu, Tingkui, Shaun Pacheco, Zeyu Chen, Chunmin Zhang, and Rongguang Liang. "Snapshot linear-Stokes imaging spectropolarimeter using division-of-focal-plane polarimetry and integral field spectroscopy." *Scientific Reports* 7 (2017).

83. Daodang Wang, Sen Zhang, Rengmao Wu, Chih Yu Huang, Hsiang-Nan Cheng, and Rongguang Liang, "Computer-aided high-accuracy testing of reflective surface with reverse Hartmann test," *Opt. Express*, 24, 19671-19681 (2016).
84. Rengmao Wu, Chih Yu Huang, Xiaoyin Zhu, Hsiang-Nan Cheng, and Rongguang Liang, "Direct three-dimensional design of compact and ultra-efficient freeform lenses for extended light sources," *Optica*, 3, 840-843 (2016).
85. Chih Yu Huang and Rongguang Liang. "Diamond turning fabrication of an ultra-compact endoscope." *Advanced Optical Technologies* 5.4, 351-357 (2016).
86. Basel Salahieh, Jeffrey J. Rodriguez, Sean Stetson, and Rongguang Liang. "Single-image full-focus reconstruction using depth-based deconvolution." *Optical Engineering* 56.4 041302-041302 (2016).
87. Zexin Feng, Brittany D. Froese, and Rongguang Liang, "Freeform illumination optics construction following an optimal transport map," *Appl. Opt.* 55, 4301-4306 (2016).
88. Rengmao Wu, Hong Hua, Pablo Benítez, Juan C. Miñano, and Rongguang Liang, "Design of compact and ultra efficient aspherical lenses for extended Lambertian sources in two-dimensional geometry," *Opt. Express* 24, 5078-5086 (2016).
89. Daodang Wang, Yangbo Xu, Rongguang Liang, Ming Kong, Jun Zhao, Baowu Zhang, and Wei Li, "High-precision method for submicron-aperture fiber point-diffraction wavefront measurement," *Opt. Express* 24, 7079-7090 (2016).
90. T. Mu, Z. Chen, C. Zhang, and R. Liang, "Mu, Tingkui, et al. "Optimal configurations of full-Stokes polarimeter with immunity to both Poisson and Gaussian noise." *Journal of Optics* 18.5 (2016).
91. Shaun Pacheco, Guoan Zhang, and Rongguang Liang, "Reflective Fourier ptychography," *J. Biomed. Opt.* 21(2) (2016).
92. Tingkui Mu, Zeyu Chen, Shaun Pacheco, Rengmao Wu, Chunmin Zhang, and Rongguang Liang, "Generation of a controllable multifocal array from a modulated azimuthally polarized beam," *Opt. Lett.* 41, 261-264 (2016).
93. Daodang Wang and Rongguang Liang. "Simultaneous polarization Mirau interferometer based on pixelated polarization camera." *Optics letters*, 41(1), 41-44(2016).
94. Donglin Ma, Shaun Pacheco, Chengliang Wang, and Rongguang Liang. "Freeform optics construction with nonuniformly sampled grids in modified double-pole coordinate system." *Optical Engineering*, 54(12), 125102-125102 (2015).
95. Tingkui Mu, Chunmin Zhang, and Rongguang Liang, "Demonstration of a snapshot full-Stokes division-of-aperture imaging polarimeter using Wollaston prism array," *Journal of Optics*, 17(12), 125708 (2015).
96. Zexin Feng, Brittany Froese, and Rongguang Liang, "Considering diffraction in paraxial nonimaging freeform optics design," *Appl. Opt.* 54, 9364-9369 (2015).
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1. Rongguang Liang, *Smartphone-based imaging systems for biomedical imaging applications*, Arizona State University (2019).
2. Rongguang Liang, *Optical Design for Biomedical Imaging*, University of Connecticut (2015).
3. Rongguang Liang, *Multimodal Optical Imaging: Technologies, Design, and Applications in dentistry*. BC Cancer Agency (2013).
4. Rongguang Liang, *Optics in Dentistry*. Beckman Laser Institute, University of California Irvine (2013).
5. Rongguang Liang, *Three-dimesional (3D) surface imaging principles and medical applications*, NIST (2012).

Invited Lectures

1. Rongguang Liang, *Methods in Biomedical Imaging/Optical Design for Biomedical Imaging* (Invited Lecture). NanoBiophotonics Summer School, University of Illinois at Urbana–Champaign (2011).
2. Rongguang Liang, *Given Imaging - Case Study* (Invited Lecture). MED699/ENT441 Medical Entrepreneurship, University of Rochester (2011).

Invited Presentations

1. Rongguang Liang, *Freeform optics: design, fabrication, test, and potential space applications*. NASA Jet Propulsion Laboratory (JPL) (2019).
2. Rongguang Liang, *Advanced optical technique for semiconductor metrology*, Intel Inc (2015).
3. Rongguang Liang, "Fluorescence image guided surgical system," OSA, Bio-Optics: Design and Application (2015).
4. Rongguang Liang, "3D Shape Measurement of Translucent Objects Using Digital Fringe Projection," SPIE, Emerging Digital Micromirror Device Based Systems and Applications V (2013).
5. Rongguang Liang, "Optical design considerations of polarization and fluorescence imaging systems," OSA Optics & Photonics Congress, Monterey, CA (2012).
6. Rongguang Liang, "Optics for Image Guided Surgery," Neuroscience DataBlitz, University of Arizona (2012).
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PATENTS

1. US11605172 Digital fringe projection and multi-spectral polarization imaging for rapid 3D reconstruction
2. US11473975 Low-cost, compact chromatic confocal module
3. US11366302 Polarization and phase microscope
4. US11274915 Interferometer with multiple wavelength sources of different coherence lengths
5. US11204509 Ultralight very large aperture space telescope and methods using mode lenses and shims
6. US10920020 3D-printing of ultra-high refractive index polymers
7. US10536617 Dual-view probe for illumination and imaging, and use thereof
8. US10070791 Apparatus for caries detection
9. US9314150 System and method for detecting tooth cracks via surface contour imaging
10. US9247241 Method and apparatus for detection of caries
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26. US7702139B2: Apparatus for caries detection
27. US7679061B2: Radiographic image sensing system

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30. US7616881B2: Zoom flash with liquid crystal lens
31. US7596253B2: Method and apparatus for detection of caries
32. US7577284B2: Optical detection of dental caries
33. US7576349B2: Radiation image readout apparatus
34. US7522322B2: Apparatus for dental shade measurement
35. US7480082B2: Radiation image scanning apparatus and method
36. US7458685B2: Automated fundus imaging system
37. US7360896B2: Fundus camera for wide field of view and small pupil
38. US7298970B2: Zoom flash with variable focus lens
39. US7296894B2: Fundus camera having scanned illumination and pupil tracking
40. US7275826B2: Fundus camera having curved mirror objective
41. US7241011B2: Fundus imaging system
42. US7164434B2: LCD based imaging apparatus for printing multiple formats
43. US7129511B2: Integrated scan module for a computer radiography input scanning system
44. US7127163B2: Ring light guide
45. US6988811B2: Optical exposure apparatus and method for aligning a substrate
46. US6943930B2: Method and system for fabricating optical film using an exposure source and reflecting surface
47. US6942344B2: Autostereoscopic display for multiple viewers
48. US6940645B2: Monocentric autostereoscopic optical apparatus with a spherical gradient-index ball lens
49. US6893129B2: Autostereoscopic display for multiple viewers
50. US6886940B1: Autostereoscopic display for multiple viewers
51. US6874899B2: Apparatus and method for irradiating a substrate
52. US6871957B2: Autostereoscopic display for multiple viewers
53. US6869183B2: Autostereoscopic optical apparatus for viewing a stereoscopic virtual image
54. US6863404B2: Method for providing a curved image
55. US6863400B1: Tiled projection display using spatial light modulators
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