

董大山

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Academic Experience

Postdoctoral Associate	Oct 2023 - now
<i>Prof. Ji-xin Cheng's Lab, ECE, Boston University</i>	<i>Boston, MA, USA</i>
Associate Research Fellow	Jul 2021 - Oct 2023
<i>Prof. Kebin Shi's Lab, School of Physics, Peking University</i>	<i>Beijing, China</i>
Postdoctoral Fellow	Jul 2019 - Jun 2021
<i>Prof. Kebin Shi's Lab, School of Physics, Peking University</i>	<i>Beijing, China</i>

Education

Peking University	<i>Ph.D. in Optics</i> Advisor: Prof. Kebin Shi	2014 - 2019
Nankai University	<i>BS in Physics</i>	2010 - 2014

Skills

[Optics] Expert in Computational Imaging, Nonlinear Optics, Holography, Microscopy, Spectroscopy

Skilled in Designing and Building Optical Systems

Proficient in Live Cell Imaging, Label-free / Fluorescence Imaging, Super-resolution Imaging

[Programming] MATLAB, C/C++, Labview, Python, Bash, \LaTeX - Proficient in **Instrument Control**, with expertise in *Imaging/Signal Acquisition* and intuitive *GUI Design*- Skilled in **Image/Signal Processing**, with experience in *Computer Vision, Data Visualization*- Experienced in **High Performance Computing** with *Parallel Programming* on *GPU and Linux-Clusters***[Softwares]** Fiji/ImageJ, Mathematica, OriginPro, Adobe AI/PS, Zemax, COMSOL

Highlighted Publications

- (1) Lige Liu[#], Dashan Dong[#], Zhiwei Long, Wanxue Wei, Chang Sun, Wei Liu, Xiaoshuai Huang, Liangyi Chen, Haizheng Zhong[✉], and Kebin Shi[✉]. “Single particle fluorescence imaging of perovskite nanocrystal crystallization for illustrating coupled nucleation-and-growth [↗](#).” *Nature Communications*, 16.5664, (2025).
- (2) Dashan Dong[#], Xiaoshuai Huang[#], Liuju Li[#], Heng Mao, Yanquan Mo, Guangyi Zhang, Zhe Zhang, Jaiyu Shen, Wei Liu, Zeming Wu, Guanghui Liu, Yanmei Liu, Hong Yang, Qihuang Gong, Kebin Shi[✉], and Liangyi Chen[✉]. “Super-resolution fluorescence-assisted diffraction computational tomography reveals the three-dimensional landscape of the cellular organelle interactome [↗](#).” *Light: Science & Applications*, 9.11, (2020).
- (3) Shuqi Mu[#], Yingtong Shi, Yintong Song, Wei Liu, Wanxue Wei, Qihuang Gong, Dashan Dong[✉], and Kebin Shi. “Multislice computational model for birefringent scattering [↗](#).” *Optica*, 10.1, (2023).
- (4) Shuqi Mu[#], Yu Yang, Juhao Li, Dashan Dong[✉], Ruijun Lan[✉], Kebin Shi. “Three dimension refractive index characterization for photonic waveguides [↗](#).” *Journal of Lightwave Technology*, 40.8, (2022).
- (5) 魏婉雪[#], 何苗, 徐坚, 董大山[✉]. “一种大视野快速光学衍射层析成像技术[↗](#).” *中国激光*, 50.3, (2023).
Wanxue Wei[#], Miao He, Jian Xu, Dashan Dong[✉]. “Large field-of-view fast optical diffractive tomographic microscopy [↗](#).” *Chinese Journal of Lasers*, 50.3, (2023).

- (6) **Dashan Dong**[#], **Kebin Shi**[✉]. “ [Solving the missing cone problem by deep learning](#) ”. *Advanced Photonics*, 2.2, (2020).

Other Publications

- (1) **Jia Danchen**[#], **Huang Steven**[#], **Tulegenov Dias**, **Dashan Dong**, **Shvets Gennady**[✉], **Cheng Ji-Xin**[✉]. “ [Metasurface-enhanced infrared photothermal microscopy towards ultrasensitive chemical analysis](#) ”. *Advanced Photonics*, 7.5, (2025).
- (2) **Qian Chen**[#], **Wen Gou**[#], **Wenqing Lu**[#], **Jie Li**, **Yuhong Wei**, **Haoyu Li**, **Chengyu Wang**, **Wei You**, **Zhengqian Li**, **Dashan Dong**, **Xiuli Bi**, **Bin Xiao**[✉], **Liangyi Chen**[✉], **Kebin Shi**[✉], **Junchao Fan**[✉], **Xiaoshuai Huang**[✉]. “ [Fast, three-dimensional, live-cell super-resolution imaging with multiplane structured illumination microscopy](#) ”. *Nature Photonics*, (2025).
- (3) **Jiaze Yin**[#], **Christian Pfluegl**, **Chu C. Teng**, **Rylie Bolarinho**, **Guo Chen**, **Xinrui Gong**, **Dashan Dong**, **Daryoosh Vakhshoori**, **Ji-Xin Cheng**[✉]. “ [Mid-infrared Energy Deposition Spectroscopy](#) ”. *Physical Review Letters*, 134.9, (2025).
- (4) **Yue Wang**[#], **Jingrui Gong**, **Ning Xu**, **Shaohui Yan**, **Dashan Dong**, **Kebin Shi**[✉]. “ [Large Field of View and Isotropic Light Sheet Microscopy with Aberration-Free Tunable Foci](#) ”. *Laser & Photonics Reviews*, 19.3, (2025).
- (5) **Wenkai Yang**[#], **Zijian Wang**, **Jian Xu**, **Dashan Dong**, **Guiyuan Cao**, **Han Lin**, **Baohua Jia**, **Lige Liu**[✉], **Kebin Shi**[✉]. “ [Ultracompact computational spectroscopy with a detour-phased planar lens](#) ”. *Light: Advanced Manufacturing*, 5.44, (2024).
- (6) **Ziheng Ji**[#], **Wentao Yu**, **Dashan Dong**, **Hong Yang**, **Kaihui Liu**, **Yun-Feng Xiao**, **Qihuang Gong**, **Qinghai Song**[✉], **Kebin Shi**[✉]. “ [High spatial resolution collinear chiral sum-frequency generation microscopy](#) ”. *Advanced Photonics Nexus*, 3.2, (2024).
- (7) **Yue Wang**[#], **Dashan Dong**, **Wenkai Yang**, **Renxi He**, **Ming Lei**, and **Kebin Shi**[✉]. “ [Reflective ultrathin light-sheet microscopy with isotropic 3D resolutions](#) ”. *Photonics Research*, 12.2, (2024).
- (8) **Peng Liu**[#], **Jing Shi**[#], **Danli Sheng**[#], **Wenqing Lu**, **Jie Guo**, **Lei Gao**, **Xiaoqing Wang**, **Shaofeng Wu**, **Yanwen Feng**, **Dashan Dong**, **Xiaoshuai Huang**[✉], and **Hongyun Tang**[✉]. “ [Mitophogenesis, a form of mitochondria-specific ectocytosis, regulates sperm mitochondrial quantity and fertility](#) ”. *Nature Cell Biology*, 25, (2023).
- (9) **Wenkai Yang**[#], **Lige Liu**[✉], **Dashan Dong**, **Yunan Gao**, **Hong Yang**, **Qihuang Gong**, and **Kebin Shi**[✉]. “ [In situ three-dimensional observation of perovskite crystallization revealed by two-photon fluorescence imaging](#) ”. *Advanced Optical Materials*, 10.13, (2022).
- (10) **Wenkai Yang**[#], **Lige Liu**[#], **Dashan Dong**, **Xin Zhang**, **Han Lin**, **Yunkun Wang**, **Hong Yang**, **Yunan Gao**, **Haizheng Zhong**, **Baohua Jia**, and **Kebin Shi**[✉]. “ [Detour-phased perovskite ultrathin planar lens using direct femtosecond laser writing](#) ”. *Photonics Research*, 10.12, (2022).
- (11) **Runfeng Li**[#], **Ruijun Lan**[✉], **Dashan Dong**, **Hong Yang**, and **Kebin Shi**[✉]. “ [Bessel beam coherent anti-Stokes Raman scattering spectroscopy for turbulent flow diagnosis](#) ”. *Applied Spectroscopy*, (2022).
- (12) **穆书奇**[#], **董大山**, **施可彬**[✉]. “ [无标记光学成像技术](#) ”. *激光与光电子学进展*, 59.12, (2022).
Shuqi Mu[#], **Dashan Dong**, **Kebin Shi**[✉]. “ [Label-free optical imaging technology](#) ”. *Laser & Optoelectronics Progress*, 59.12, (2022).
- (13) **李润丰**[#], **董大山**, **施可彬**[✉]. “ [光场调控在相干拉曼散射光谱与成像中的应用 \(特邀\)](#) ”. *光子学报*, 50.1, (2022).
Runfeng Li[#], **Dashan Dong**, **Kebin Shi**[✉]. “ [Coherent Raman scattering spectroscopy and microscopy based on optical field engineering \(Invited\)](#) ”. *Acta Photonica Sinica*, 51.1, (2022).
- (14) **Wei Liu**[#], **Dashan Dong**, **Hong Yang**, **Qihuang Gong**, and **Kebin Shi**[✉]. “ [Robust and high-speed rotation control in optical tweezers by using polarization synthesis based on heterodyne interference](#) ”. *Opto-Electronic Advances*, 3.8, (2020).
- (15) **Shuanglong Liu**[#], **Bowen Sheng**, **Xinqiang Wang**[✉], **Dashan Dong**, **Ping Wang**, **Zhaoying Chen**, **Tao Wang**, **Xin Rong**, **Duo Li**, **Liuyun Yang**, **Shangfeng Liu**, **Mo Li**, **Jian Zhang**, **Weikun Ge**, **Kebin Shi**, **Yuzhen Tong**, **Bo Shen**. “ [Molecular beam epitaxy of single-crystalline aluminum film for low threshold ultraviolet plasmonic nanolasers](#) ”. *Applied Physics Letters*, 122.23, (2018).
- (16) **Wentao Yu**[#], **Ziheng Ji**, **Dashan Dong**, **Xusan Yang**, **Yunfeng Xiao**, **Qihuang Gong**, **Peng Xi**[✉], and **Kebin Shi**[✉]. “ [Superresolu-](#)

- tion deep imaging with hollow Bessel beam STED microscopy [↗](#) .” *Laser & Photonics Reviews*, 10.1, (2016).
- (17) Yonggang Lv[#], Ziheng Ji, **Dashan Dong**, Kebin Shi[✉], and Qihuang Gong. “Wide-field vibrational phase contrast imaging based on coherent anti-Stokes Raman scattering holography [↗](#) .” *Chinese Physics Letters*, 32.7, (2015).
- (18) Bin Tsai[#], Wei Liu, **Dashan Dong**, Kebin Shi, Liangyi Chen, Ning Gao[✉]. “Phase separation of Mer2 organizes the meiotic loop-axis structure of chromatin during meiosis I [↗](#) .” *bioRxiv*, (2020).

Conference Abstracts

- (1) Wanxue Wei, **Dashan Dong**, Kebin Shi. “Fast optical diffraction tomography microscopy with large field of view and lossless pupil beam combination [↗](#) .” *Ultrafast Nonlinear Imaging and Spectroscopy XII*, Proc. SPIE 1313910, (2024).
- (2) **Dashan Dong**, Xiaoshuai Huang, Liuju Li, Kebin Shi, and Liangyi Chen. “Super-Resolution Fluorescence Assisted Diffraction Computational Tomography Reveals the Three-Dimensional Landscape of Cellular Organelle Interactome [↗](#) .” *Advanced Optical Imaging Technologies III*, SPIE/COS Photonics Asia 115490G, (2020).
- (3) **Dashan Dong**, Xiaoshuai Huang, Liuju Li, Kebin Shi, and Liangyi Chen. “Super-Resolution Fluorescence Assisted Diffraction Computational Tomography Reveals the Three-Dimensional Landscape of Cellular Organelle Interactome [↗](#) .” *Digital Holography and Three-Dimensional Imaging 2020*, Imaging and Applied Optics Congress, Optica Publishing Group HF1G.6, (2020).
- (4) **Dashan Dong**, Yanhui Cai, Ziheng Ji, Hong Yang, Qihuang Gong, and Kebin Shi. “Tomographic Diffractive Microscopy for Better 3D Imaging [↗](#) .” *14th International Conference on Photonics and Imaging in Biology and Medicine*, Optica Publishing Group W3A.43, (2017).
- (5) Kebin Shi, **Dashan Dong**, Yanhui Cai, Wei Liu, Chendi Shao. “High resolution nonlinear imaging based on optical field engineering [↗](#) .” *Ultrafast Nonlinear Imaging and Spectroscopy V*, Proc. SPIE 1038000Z, (2017).

Patents

- (1) Dual-modality microscopic imaging system and method [↗](#) International Patent PCT/CN2021/071393, (2020)
- (2) Off-axis holographic beam combining device and method based on missing reflector [↗](#) CN Patent 2023110715739, (2023)
- (3) Dual-modality microscopic imaging system and imaging method [↗](#) CN Patent ZL202110946936.3, (2022)
- (4) Reflective axial light sheet fluorescence microscopy imaging device and method based on microprism [↗](#) CN Patent ZL 202110817118.3, (2022)
- (5) Bessel CARS-based turbulence spectral measurement system and its detection method [↗](#) CN Patent ZL202110667298.1, (2022)
- (6) Dual-modality microscopic imaging system and method [↗](#) CN Patent ZL202010059510.1, (2022)
- (7) Device and method for generating dynamic cylindrical vector light field based on optical heterodyne interferometry [↗](#) CN Patent ZL202010493775.2, (2021)
- (8) GB-STED based deep-layer super-resolution laser direct writing system and implementation method thereof [↗](#) CN Patent ZL202010069141.4, (2020)

Received Grants

[Co-PI] Young Scientists Sub-Project (Label-free imaging and big-data machine learning)		2022
	Super-resolution 3D landscape imaging and resolving technology of living cell	CNY 2,340,000
	National Key Research and Development Program of China	
[Co-PI] Clinical Medicine Plus X - Young Scholars Project		2022
	Exploring the role of lipid droplets in egg asymmetric division based on label-free imaging	CNY 100,000

[PI] Young Scientist Fund (12004013)	2021
Reflective optical diffraction tomography for live cell imaging and its application	CNY 240,000
National Natural Science Foundation of China	
[PI] No.68 General Fund (2020M680220)	2021
Super-resolution fluorescence-assisted optical diffraction tomography and its application	CNY 80,000
China Postdoctoral Science Foundation	

Conference Presentations

[Oral] Optica Biophotonics Congress 2025	Apr 2025
<i>Super-Resolution Chemical Imaging via Structured Illumination Fluorescence-Detected Mid-Infrared Photothermal Microscopy</i>	San Diego
[Poster] Chemical Imaging 2023, Gordon Research Conference	Aug 2023
<i>Optical Diffraction Tomography Reveals the 3D Landscape of Living Cells</i>	Boston, USA
[Invited] Advanced Imaging and Information Processing Conference (AIIP 2023)	Jul 2023
<i>New Technologies for Bio-Optical Imaging with Low Phototoxicity</i>	Jinggangshan, China
[Invited] 第三届全国光子技术论坛	Apr 2023
<i>High-Resolution Imaging Based on Light Field Modulation and Applications</i>	Guangzhou, China
[Invited] International Computational Imaging Conference (CSOE-CITA 2022)	Oct 2022
<i>Live Cell Landscape Imaging Based on Optical Diffraction Tomographic Microscopy</i>	Shanghai, China
[Invited] 5th Optics Young Scientist Summit (OYSS2022)	Sep 2022
<i>High-Resolution Imaging Based on Light Field Modulation and Applications</i>	Fuzhou, China
[Invited] 20th National Symposium on Basic Optics and Optical Physics	Sep 2021
<i>Live Cell Optical Diffraction Tomographic Imaging Based on 4D Spatiotemporal Continuity</i>	Yanji, China
[Invited] The Chinese Optical Society (COS) Academic Conference 2021	Sep 2021
<i>Optical Diffraction Tomographic Microscopy Based on 4D Spatiotemporal Continuity</i>	Shenzhen, China
[Invited] 4th Optics Young Scientist Summit (OYSS2020)	Dec 2020
<i>Optical Diffraction Tomographic Microscopy and Its Applications</i>	Ningbo, China
[Oral] 第二届全国光子技术论坛	Nov 2020
<i>Optical Diffraction Tomographic Microscopy and Its Applications</i>	Guangzhou, China
[Invited] Chinese Electron Microscopy Society Academic Conference 2020	Nov 2020
<i>Live Cell Landscape Imaging Based on Optical Diffraction Tomographic Microscopy</i>	Chendu, China
[Oral] The 12th National Academic Forum on Optical Youth	Nov 2020
<i>Optical Diffraction Tomographic Microscopy and Its Applications</i>	Baoding, China
[Oral] SPIE/COS Photonics Asia 2020	Oct 2020
<i>Super-Resolution Fluorescence Assisted Diffraction Computational Tomography Reveals the Three-Dimensional Landscape of Cellular Organelle Interactome</i>	Webinar
[Oral] Digital Holography and Three-Dimensional Imaging, Imaging and Applied Optics Congress	Jun 2020
<i>Super-Resolution Fluorescence Assisted Diffraction Computational Tomography Reveals the Three-Dimensional Landscape of Cellular Organelle Interactome</i>	Webinar
[Poster] International Conference on Photonics and Imaging in Biology and Medicine	Sep 2017
<i>Tomographic Diffractive Microscopy for Better 3D Imaging</i>	Suzhou, China

[Poster] SPIE Optics + Photonics 2017

Aug 2017

Tomographic Diffractive Microscopy for Better 3D Imaging

San Diego, USA

[Oral] Chinese Physical Society (CPS) Fall Meeting

Aug 2016

Optical Diffraction Tomographic Microscopy

Beijing, China

Services

[Reviewer] Photonics Research, Optics Letters, Optics Express, Advanced Science, APL Photonics,
Chinese Journal of Lasers, Acta Optica Sinica

[Program Committee] Topic 9: Biomedicine and Computational Imaging, International Computational Imaging Conference
(CSOE-CITA) 2022, 2023

[Youth Editor] Chinese Journal of Lasers 2022, 2023

[Volunteer] SPIE/COS Photonics Asia 2016, 2022

[President] Peking Univ. Club, SPIE Student Chapter 2017

[Vice President] Peking Univ. Club, SPIE Student Chapter 2016

Theses

[Doctoral Thesis] [Research on Optical Diffraction Tomographic Microscopy](#)

Supervisor: Prof. Kebin Shi, Peking University

[Bachelor Thesis] [Characteristics of Novel Vector Field](#)

Supervisor: Prof. Yongnan Li, Nankai University

Honors & Awards

[2022] Gan Zizhao Scholarship for Outstanding Postdoctoral Fellows *Peking University*

[2022] Important Advance for Institute of Modern Optics *Peking University*

[2017] May 4th Scholarship *Peking University*

[2017] Individual Honor for Research Excellence *Peking University*

[2013] He-Zhang Encouragement Scholarship
Foundation for the Development of Science and Technology Museums in China

[2012] National Encouragement Scholarship *Nankai University*

[2012] Merit Student *Nankai University*

[2011] Outstanding Student Scholarship in Fundamental Science *Nankai University*