

# Yiyang Chen

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## Education

**Washington University in St. Louis (WashU)** St. Louis, MO  
PhD in *Imaging Science* Sept 2021 - present

- **Advisor:** Matthew Lew, PhD
- **Thesis** (unfinished): Multi-dimensional Single Molecule Nanoscopy to Elucidate the Structure and Conformational Dynamics of Cell Membrane Proteins
- **Coursework:** Machine Learning, Large-scale Optimization for Data Science, Detection and Estimation Theory, Theoretical Imaging Science, Fundamentals and Applications of Modern Optical Imaging, ...

**Nankai University (NKU)** Tianjin, China  
BS in *Physics* (Poling Class of Physics) Sept 2017 - June 2021

- **Thesis:** The Study of Deformability of Human Erythrocyte Based on Microfluidics
- **Coursework:** Electrodynamics, Optics, Introduction to Biophysics, Molecular Biophysics, Biomedical Physics, ...

## Research Experience

**Single-Molecule Orientation Localization Microscopy (SMOLM)** May 2022 – present  
Lew Lab, The Preston M. Green Department of Electrical & Systems Engineering, St. Louis, MO  
Washington University in St. Louis

Advisor: Matthew Lew, PhD

- Analyze fundamental precision limits for resolving the orientation separation of two spatially overlapping fluorescent dipole emitters.
- Design and engineer dipole-spread function (DSF) using optimization algorithms.
- Develop appropriate labeling techniques for protein imaging in orientation microscopy.

**Study of Human Red Blood Cells Based on Microfluidics and Single-Molecule Localization Microscopy** Apr 2019 – June 2021

Biomedical Optics Lab, School of Physics, Nankai University Tianjin, China

Advisor: Leiting Pan, PhD

\* This project is supported by the *China National University Student Innovation & Entrepreneurship Development Program*.

- Measured human red blood cell deformability by the speed of cells traveling through narrow channels.
- Designed microfluidic ratchet chip for sorting the hRBCs in different life stages, and confirmed availability with COMSOL simulation.
- Imaged the structure of actin-spectrin network on hRBC membrane cytoskeleton and hRBC membrane protein CD47 diffusivity using STORM, with related data analysis using MATLAB.

**Immunofluorescent Biomarker for Zebrafish Somitogenesis and Single Cell Oscillation** July 2019 – Sept 2019

Yang Lab, Department of Biophysics, University of Michigan Ann Arbor, MI

Advisor: Qiong Yang, PhD

- Developed immunofluorescent biomarkers for different signaling pathways, *Ntla* and *Tbx16*, in zebrafish somitogenesis process and segmentation clock.
- Distinguished oscillating cells of different phenotypes within both zebrafish embryos and cell dispersal systems.

## Publications

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### Preprints

1. **Chen, Y.**, Qiu, Y. & Lew, M. D. Resolving the Orientations of and Angular Separation between an Overlapping Pair of Dipole Emitters. *arXiv* 2406.04469 (2024), under review at *Phys. Rev. Lett.*.

### Conference Presentations

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1. "Resolving the Orientations of and Separation between an Overlapping Pair of Dipole Emitters". *Gordon Research Conferences: Single Molecule Approaches to Biology*, Newry, ME, July 2024 (poster)

### Professional Activities

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<b>Spectra</b> , Optica (formerly OSA) & SPIE joint student chapter at <i>Washington University in St. Louis</i>	
Co-president (Optica liaison)	2023 - 2024
<ul style="list-style-type: none"><li>• Organized 2024 Spectra student-led conference and served as committee co-chair.</li><li>• Organized Spectra summer coffee hour &amp; career panel series.</li></ul>	
Vice president (Imaging Science Pathway liaison)	2022 - 2023
<ul style="list-style-type: none"><li>• Participated in Spectra SciFest outreach activity at St. Louis Science Center.</li><li>• Organized monthly student seminars (joint with WashU Imaging Science Student Chapter).</li></ul>	
<b>Medical Physics Summer School</b> at <i>Duke Kunshan University</i>	Aug 2020
<b>The Physics of Life Online Summer School</b> at <i>Princeton University</i>	June 2020 - Aug 2020
<b>Optica</b> (formerly OSA) <b>student chapter</b> at <i>School of Physics, Nankai University</i>	
Student officer	2018 - 2020
<ul style="list-style-type: none"><li>• Organized workshops with students and faculty members.</li></ul>	

### Honors and Awards

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<b>Excellence Award</b> , China National University Student Innovation & Entrepreneurship Development Program	Mar 2021
<b>First Prize</b> , Nankai Physics Tournament	May 2018
<b>Poling Scholarship</b> , Nankai University	Oct 2017

### Skills

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**Programming & Software:** MATLAB, Python, Wolfram Mathematica, PyMOL

**Laboratory:** Cell culture, Immunolabeling

**Languages:** Chinese (native), English (proficient)