

# Xueyue (Sherry) Zhang

PhD candidate in Applied Physics, Caltech

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🌐 <https://xueyue-sherry-zhang.github.io/>

## Research Positions

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<b>Research assistant, Caltech</b> Advisor: Oskar J. Painter, John G. Braun Professor of Applied Physics	<b>Aug 2017 - Present</b>
<b>Summer undergraduate research fellow, Caltech</b> Advisor: Kerry J. Vahala, Ted and Ginger Jenkins Professor of Applied Physics	<b>June 2016 - Sept 2016</b>
<b>Undergraduate researcher, Peking University</b> Advisor: Yun-Feng Xiao, Associate Professor of Physics	<b>Jan 2016 - June 2017</b>
<b>Undergraduate researcher, Georgia Tech</b> Advisor: Wenshan Cai, Associate Professor of Electrical and Computer Engineering	<b>Sept 2015 - Dec 2015</b>
<b>Undergraduate researcher, Tsinghua University</b> Advisors: Wei Zhang, Associate Professor of Electronic Engineering. Yu-xi Liu, Professor of Microelectronic Science and Engineering	<b>Sept 2014 - June 2017</b>

## Education

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<b>Ph. D. in Applied Physics (expect in Feb. 2023)</b> California Institute of Technology	<b>Sept 2017 - Present</b>
<b>Exchange student in Electrical and Computer Engineering</b> Georgia Institute of Technology	<b>Sept 2015 - Dec 2015</b>
<b>B. Eng. with honor in Microelectronic Science and Engineering</b> Tsinghua University	<b>Sept 2013 - June 2017</b>

## Research Interests

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- **Quantum devices and their applications:** superconducting circuits, microwave metamaterials
- **Quantum simulations:** many-body physics, topological physics, quantum optics
- **Micro- and nano-photonics:** ultra-high-quality optical resonators, nonlinear optics

## Academic Awards

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<b>Miller research fellowship</b> , UC Berkeley	2022
<b>Yariv/Blauvelt fellowship</b> , Caltech	2017
<b>Graduate fellowships</b> , Stanford (3-year SGF fellowship)/UC Berkeley/MIT/Harvard/Princeton. All declined for the Caltech fellowship	2017
<b>Outstanding Graduate</b> , Beijing Ministry of Education	2017
<b>Best undergraduate thesis</b> , Tsinghua University	2017
<b>First place in college entrance exam (1/200,000)</b> , Xinjiang Ministry of Education	2013

## Publications

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Up to date list is always available on my Google Scholar page [\[link\]](#).

- “A superconducting quantum simulator based on a photonic-bandgap metamaterial”  
**Xueyue Zhang\*** (\*Equal contribution), Eunjong Kim\*, Daniel K. Mark, Soonwon Choi, Oskar Painter  
[arXiv: 2206.12803 \(Accepted as a Research Article in Science\)](#) (2022)

- “Quantum electrodynamics in a topological waveguide”  
Eunjong Kim\*, **Xueyue Zhang\***, Vinicius S Ferreira, Jash Banker, Joseph K Iverson, Alp Sipahigil, Miguel Bello, Alejandro Gonzalez-Tudela, Mohammad Mirhosseini, Oskar Painter  
[\*Phys. Rev. X\* \*\*11\*\* 1, 011015 \(2021\)](#)  
Featured in [\*Physics\*](#)
- “Cavity quantum electrodynamics with atom-like mirrors”  
Mohammad Mirhosseini\*, Eunjong Kim\*, **Xueyue Zhang**, Alp Sipahigil, Paul B Dieterle, Andrew J Keller, Ana Asenjo-Garcia, Darrick E Chang, Oskar Painter  
[\*Nature\* \*\*569\*\*, 7758 \(2019\)](#)
- “Metasurfaces for near-eye augmented reality”  
Shoufeng Lan\*, **Xueyue Zhang\***, Mohammad Taghinejad, Sean Rodrigues, Kyu-Tae Lee, Zhaocheng Liu, Wenshan Cai  
[\*ACS Photonics\* \*\*6\*\*, 4 \(2019\)](#)
- “Symmetry-breaking-induced nonlinear optics at a microcavity surface”  
**Xueyue Zhang\***, Qi-Tao Cao\*, Zhuo Wang, Yu-xi Liu, Cheng-Wei Qiu, Lan Yang, Qihuang Gong, Yun-Feng Xiao  
[\*Nature Photonics\* \*\*13\*\*, 1 \(2019\)](#)
- “Single-mode dispersive waves and soliton microcomb dynamics”  
Xu Yi\*, Qi-Fan Yang\*, **Xueyue Zhang\***, Ki Youl Yang, Xinbai Li and Kerry Vahala  
[\*Nature Communications\* \*\*8\*\*, 14869 \(2017\)](#)
- “A point acoustic device based on aluminum nanowires”  
Qian-Yi Xie\*, Zhen-Yi Ju\*, He Tian, Qing-Tang Xue, Yuan-Quan Chen, Lu-Qi Tao, Mohammad Ali Mohammad, **Xue-Yue Zhang**, Yi Yang and Tian-Ling Ren  
[\*Nanoscale\* \*\*8\*\*, 10 \(2016\)](#)

## Invited Talks

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- “A scalable superconducting quantum architecture with long-range connectivity”, QuantumFest, Harvard University, December 15, 2022
- “A scalable superconducting quantum architecture with long-range connectivity”, Special Seminar, Stanford University, September 16, 2022
- “A scalable superconducting quantum architecture with long-range connectivity”, [IQIM Seminar](#), Caltech, September 9, 2022
- “A scalable superconducting quantum architecture with long-range connectivity”, [Joint seminar by HKUST ECE department and IEEE HKED/SSC Joint Chapter](#), September 2, 2022
- “A scalable superconducting quantum architecture with long-range connectivity”, [AMO/QI Seminar](#), UC Berkeley, August 24, 2022
- “A scalable superconducting quantum architecture with long-range connectivity”, Special Seminar, University of Chicago (Prof. Liang Jiang’s group), August 15, 2022
- “A scalable superconducting quantum architecture with long-range connectivity”, Special Seminar, UC Berkeley (Prof. Norman Yao’s group), July 12, 2022
- “Waveguide quantum electrodynamics towards many-body physics”, Institute for Interdisciplinary Information Sciences, Tsinghua University (virtual), May 20, 2022
- “Waveguide quantum electrodynamics with superconducting qubits”, Institute of Computing technology, Chinese Academy of Sciences (virtual), March 30, 2021

## Conference Presentations

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- Xueyue Zhang, Eun Jong Kim, Oskar Painter, “Characterization of a superconducting metamaterial quantum many-body simulator”, APS March Meeting 2022, Chicago IL
- Xueyue Zhang, Eun Jong Kim, Oskar Painter, “A superconducting metamaterial quantum processor for studying quantum many-body physics: Part 1”, APS March Meeting 2021, virtual

- Xueyue Zhang, Eun Jong Kim, Alp Sipahigil, Vinicius Ferreira, Jash Banker, Mohammad Mirhosseini, Oskar Painter, “Quantum electrodynamics in a topological metamaterial: Part 2”, APS March Meeting 2020, virtual
- Xueyue Zhang, Eun Jong Kim, Mohammad Mirhosseini, Alp Sipahigil, Paul Dieterle, Andrew Keller, Ana Asenjo-Garcia, Darrick Chang, Oskar Painter, “Waveguide-mediated interaction of artificial atoms in the strong coupling regime, part 1”, APS March Meeting 2019, Boston MA
- Xueyue Zhang, Eun Jong Kim, Mohammad Mirhosseini, Alp Sipahigil, Andrew Keller, Oskar Painter, “Interaction of a superconducting qubit and an atomic mirror in waveguide quantum electrodynamics”, Gordon Research Conference: Quantum Science 2018, Eaton MA

## Professional Activities

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Reviewer for *Nature Physics*, *Physical Review Letters*, *Physical Review A*, *Physical Review B*, *Scientific Report*

## Teaching and Mentoring

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- **Teaching assistant**, EE/APH 158 Quantum Electrical Circuits. Instructor: Prof. Mohammad Mirhosseini. Caltech 2022.  
Co-developed the course content and homework for the first-run class. Lectured the part on quantum gates. TA rating 4.92/5.
- **Invited teaching**, HSSP summer school: Quantum Information and Technology, MIT 2019
- **Research mentor**, for Emily Parnell, an undergraduate summer researcher at Caltech in 2022.
- **Research mentor**, for Zhaoyi Zheng, an undergraduate summer researcher at Caltech (now a PhD student at Princeton) in 2020.
- **Research mentor**, for Aziza Almanakly, an undergraduate summer researcher at Caltech (now a PhD student at MIT) in 2019.

## Outreach and Diversity Activities

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- Invited speaker for a scientific talk with audience of junior and senior undergraduate women\*. Organized by [FUTURE](#) at Caltech, Sept 12, 2022.
- Invited speaker for a lightning talk session (virtual) with hundreds of high school students as the audience. Organized by [QubitByQubit](#), Dec 12, 2021.
- Invited speaker for a scientific talk with audience of junior and senior undergraduate women\*. Organized by [FUTURE](#) at Caltech, Sept 13, 2021.
- Steering committee member, Womxn in EAS, Caltech, Aug 2021 – present.