

Jun Ji

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Research Interests



Integrated Phononic Devices

Acoustic Metamaterials/Metasurfaces

Nonlinear Acoustic Waves

Nanofabrications

Education



Ph.D. in Acoustics

The Pennsylvania State University

Dec 2023

State College, PA

Advisor: Prof. Yun Jing

B.Eng. in Energy and Power Engineering

Jiangsu University

Jun 2018

Zhenjiang, China

Employment



Postdoctoral Associate

Virginia Polytechnic Institute and State University

Jan-2024 –

Blacksburg, VA

Advisor: Prof. Linbo Shao

Research Scientist Intern

Facebook, Inc.

May-2022 – Dec-2022

Redmond, WA

Advisor: Dr. Chuming Zhao

Publications



Below you can find a list of my academic publications, along with links to DOI.

Bold author: **self**. "+": equal contributions. "*": corresponding authors.

Journal Articles

- [J20] Jun Ji, Joseph G. Thomas, Zichen Xi, Ruxuan Liu, Qinxue Fang, Ivan I. Kravchenko, Andreas Beling, Xu Yi, Yizheng Zhu, and Linbo Shao*, "Low-loss phononic integrated circuit using silicon nitride on lithium niobate," Under preparation.
- [J19] Jun Ji, Joseph G. Thomas, Zichen Xi, Liyang Jin, Dayl P. Briggs, Ivan I. Kravchenko, Arya G. Pour, Liyan Zhu, Yizheng Zhu, and Linbo Shao*, "On-chip cavity electro-acoustics using lithium niobate phononic crystal resonators," Under preparation.
- [J18] Zengyu Cen, Zichen Xi, Dongyao Wang, Joseph G. Thomas, Bernadeta, Tanmay Singh, Jun Ji, Yizheng Zhu, Linbo Shao, and Yu Yao*, "The Working Principle and a Physical Model of an MPnC Photodetector," Under preparation
- [J17] Liyang Jin, Zichen Xi, Joseph G. Thomas, Jun Ji, Yuanzhi Zhang, Nuo Chen, Yizheng Zhu, Linbo Shao*, and Liyan Zhu*, "Microwave-acoustic-driven power electronics," Under review.
- [J16] Andy Chen, Jeewoo Kim, Jun Ji*, and Yun Jing*, "Modeling and measurement of a time-modulated acoustic metasurface backed by a cavity," *npj Acoustics*, Under review.
- [J15] Zichen Xi, Hsuan-Hao Lu, Jun Ji, Bernadeta R. Srijanto, Ivan I. Kravchenko, Yizheng Zhu, and Linbo Shao*, "Injection locking of surface acoustic wave phononic crystal oscillator," *Physica Status Solidi A: Applications and Materials Science*. 2025; 000, e202500605. [doi](#)
- [J14] Joseph G. Thomas, Zichen Xi, Jun Ji, Guannan Shi, Bernadeta R. Srijanto, Ivan I. Kravchenko, Yu Yao, Linbo Shao, and Yizheng Zhu*, "High Speed Surface Acoustic Wave Imaging with Spectral Interferometry," *Optica*, 12, 935-944 (2025) [doi](#)
- [J13] Zichen Xi⁺, Zengyu Cen⁺, Dongyao Wang⁺, Joseph G. Thomas, Bernadeta R. Srijanto, Ivan I. Kravchenko, Jiawei Zuo, Honghu Liu, Jun Ji, Yizheng Zhu, Yu Yao*, and Linbo Shao*, "Room-temperature mid-infrared detection using metasurface-absorber-integrated phononic crystal oscillator," *Laser & Photonics Reviews*, 2025, e00498. [doi](#) **Featured as Back Cover.**
- [J12] Jun Ji, Zichen Xi, Joseph G. Thomas, Bernadeta R. Srijanto, Ivan I. Kravchenko, Pranay Baikadi, Minglei Sun, William G. Vandenberghe, Ming Jin, Yizheng Zhu, Wenjie Xiong*, and Linbo Shao*, "Synthetic-domain computing and neural networks using lithium niobate integrated nonlinear phononics," *Nature Electronics*, 2025. [doi](#)
- [J11] Jiaxin Zhong⁺, Pedro Fittipaldi de Castro⁺, Tianhong Lu, Jeewoo Kim, Mourad Oudich, Jun Ji, Li Shi, Kai Chen, Jing Lu*, Yun Jing*, and Wladimir A. Benalcazar*, "Higher-order skin effect and its observation in an acoustic kagome lattice," *Physical Review B*, 111, 014314, (2025) [doi](#)

- [J10] Zichen Xi, Joseph G. Thomas, **Jun Ji**, Dongyao Wang, Zengyu Cen, Ivan I. Kravchenko, Yu Yao, Yizheng Zhu, and Linbo Shao*, "GHz-frequency Low-phase-noise Oscillator Leveraging On-chip Phononic Crystal Resonator," *Physical Review Applied*, 23, 024054 (2025). [doi](#)
- [J09] Jiaxin Zhong⁺, **Jun Ji**⁺, Xiaoxing Xia, Hyeonu Heo, and Yun Jing*, "Audible enclaves crafted by nonlinear self-bending ultrasonic beams," *Proceedings of the National Academy of Sciences*, 122 (12), e2408975122, 2025 [doi](#) **Highlighted as News Report: The Times; Scientific American; The Conversation US; IEEE Spectrum; EL PAIS; PSU News**
- [J08] Jiaxin Zhong⁺, Chengbo Hu⁺, Kangkang Wang, **Jun Ji**, Tao Zhuang, Haishan Zou, Jing Lu, Hyeonu Heo, Bin Liang*, Yun Jing*, and Jian-Chun Cheng* "Local-nonlinearity-enabled Deep Sub-diffraction Control of Acoustic Waves," *Physical Review Letters*, 131, 234001 (2023). [doi](#)
- [J07] **Jun Ji**⁺, Hyeonu Heo⁺, Jiaxin Zhong⁺, Mourad Oudich*, and Yun Jing*, "Metamaterial-enabled wireless and contactless ultrasonic power transfer and data transmission through a metallic wall," *Physical Review Applied*, 21, 014059 (2024). [doi](#)
- [J06] Dongyi Wang⁺, Yuanchen Deng⁺, **Jun Ji**, Mourad Oudich, Wladimir A. Benalcazar*, Guancong Ma*, and Yun Jing*, "Realization of a Z-classified chiral symmetric higher-order topological insulator in a coupling-inverted acoustic crystal," *Physical Review Letters*, 131, 157201 (2023). [doi](#) **Editor's Selection.**
- [J05] **Jun Ji**, Chuming Zhao*, Frank Yao, Tetsuro Oishi, John Stewart, and Yun Jing, "Metamaterial-Augmented head-mounted audio module," *Advanced Material Technology*, 2300834 (2023). [doi](#) **Featured as Back Cover.**
- [J04] **Jun Ji**, Junfei Li, Steven A. Cummer and Yun Jing*, "Ultra-sparse near-perfect sound absorbers," *J. Acoust. Soc. Am.*, Express Letter 3, 034001 (2023). [doi](#)
- [J03] **Jun Ji**⁺, Dongting Li⁺, Yong Li, and Yun Jing*, "Low-frequency broadband acoustic metasurface absorbing panels," *Frontier in Mechanical Engineering*, 6, 586249 (2020). [doi](#)
- [J02] Yuanchen Deng⁺, Mourad Oudich⁺, Nikhil JRK Gerard, **Jun Ji**, Minghui Lu, and Yun Jing*, "Magic-angle bilayer phononic graphene," *Physical Review B*, 102 (18), 180304 (2020). [doi](#)
- [J01] Xiuyuan Peng, **Jun Ji**, and Yun Jing*, "Composite honeycomb metasurface panel for broadband sound absorption," *J. Acoust. Soc. Am.*, 144, EL255-EL261 (2018) [doi](#)

Patents

- [P03] Mudassir Hussain, Kazuki Nagashima, Hiroyuki Nakano, Yoshiyuki Kunifusa, Masaya Nishida, Yun Jing, **Jun Ji**, Hyeonu Heo, Mourad Oudich, "Acoustic transmission enhancer and acoustic transmission enhancement system," *US Patent Application*. 18/127, 181 (03/28/2023) [doi](#)
- [P02] Chuming Zhao, **Jun Ji**, Xiaochu Yao, John Stewart, "Broadband audio enhancement using a metamaterial structure in a front volume of a loudspeaker," *US Patent Application*, 63/454, 903 (03/27/2023)
- [P01] Yun Jing, **Jun Ji**, "Sound absorbing panels," *US Patent Application*, 18/705, 355 (10/28/2022) [doi](#)

Conference Communications

- [C11] **Jun Ji**, Zichen Xi, Joseph G Thomas, Bernadeta R Srijanto, Ivan I Kravchenko, Ming Jin, Yizheng Zhu, Wenjie Xiong, Linbo Shao "Synthetic-domain Neural Networks using Integrated Nonlinear Phononics on Lithium Niobate," *CLEO: Science and Innovations*, SS103_3, 2025.
- [C10] Joseph Thomas, Zichen Xi, **Jun Ji**, Guanani Shi, Bernadeta R Srijanto, Ivan I. Kravchenko, Yu Yao, Linbo Shao, Yizheng Zhu "High Speed Surface Acoustic Wave Imaging with Spectral Interferometry," *CLEO: Science and Innovations*, SS118_6, 2025.
- [C09] Zichen Xi, Dongyao Wang, Zengyu Cen, Joseph Thomas, Bernadeta R Srijanto, Ivan I. Kravchenko, Jiawei Zuo, **Jun Ji**, Yizheng Zhu, Yu Yao, Linbo Shao, "Ultra-sensitive Room-temperature Mid-infrared Detector using Phononic Crystal Oscillator," *CLEO: Science and Innovations*, 2025.
- [C08] Zichen Xi, Dongyao Wang, Zengyu Cen, **Jun Ji**, Joseph Thomas, Jiawei Zuo, Yizheng Zhu, Yu Yao, Linbo Shao, "Infrared Detection Leveraging Low-phase-noise Surface Acoustic Wave Oscillators," *IEEE Research and Applications of Photonics in Defense Conference*, Miramar Beach, FL, 14-16 August, 2024.
- [C07] Yun Jing, **Jun Ji**, "Towards extraordinary sound absorption using coupled resonances," *ASA meeting*, Ottawa, Canada, 13-17 May, 2024.
- [C06] **Jun Ji**, Hyeonu Heo, Jiaxin Zhong, Mourad Oudich, Yun Jing, "Through-metal-Wall Power Delivery Using an Ultrasonic pillar-Based metamaterial," *IEEE International Ultrasonics Symposium (IUS)*, Montreal, Quebec, Canada, 3-8 Sep, 2023.
- [C05] John Case, Carter Paprocki, Hannah Kurdila, Trent Furlong, Eric Rokni, Yu-Tong Wang, Jiaxin Zhong, **Jun Ji**, Daniel Russell, Andrew Barnard, "Sound power characterization of Corsi-Rosenthal boxes using DIY comparison method," *Noise-Con 2023*, Grand Rapids, MI, 15-18 May, 2023.
- [C04] **Jun Ji**, Junfei Li, Nikhil JRK Gerard, Xiuyuan Peng, Steven Cummer, Yun Jing, "Chirality-selective transmission of acoustic orbital angular momentum through lossy metasurfaces," *ASA meeting*, Chicago, IL, 8-12 May, 2022.
- [C03] **Jun Ji**, Junfei Li, Steve Cummer, Yun Jing, "Ultra-sparse near-perfect sound absorbers," *ASA meeting*, Seattle, WA, 29 Nov-3 Dec, 2021.
- [C02] Yun Jing, **Jun Ji**, "Optimization on metasurface-enabled sound absorbing panels," *ASA meeting*, San Diego, CA 2-7 Dec, 2019.
- [C01] **Jun Ji**, Ni Sui, Xiang Yan, Fuh-Gwo Yuan, Yun Jing, "Theoretical study of a metasurface-based sound absorber," *ASA meeting*, Louisville, Kentucky 13-17 May, 2019.

Grants



Sponsor: Commonwealth Cyber Initiative Southwest Virginia Node, Virginia's Center for Innovative Technology	
\$50,000 awarded as Co-PI ; PI: Prof. Linbo Shao	
Acoustic complementary metamaterials for enhanced sound transmission	📅 Sep 2021 - Apr 2022
Sponsor: Murata Manufacturing Co., Ltd.	
\$55,000 awarded, major contribution (90%) in writing; PI: Prof. Yun Jing	
Towards contactless and wireless ultrasound power and data transfer across barriers using pillared acoustic metamaterials	📅 Dec 2023
Sponsor: NSF(CCSS)	
Not awarded; partial contribution (30%) in writing; PI: Prof. Yun Jing	

Teaching and mentoring



Teaching	
Guest lecturer	📅 Nov 2024
Course: ECE 4134 (Photonics) / 5134G (Advanced Fiber Optics and Applications)	
Invited to give a lecture on “Optical Computing and Optical Neural Networks”	
Mentoring	
• Ph.D. student: Jeewoo Kim (Penn State)	📅 2025
• Master student: Andy Chen (Penn State)	📅 2024-2025
• Undergraduate student: Ben Kreager (research intern, NCSU)	📅 2019

Professional Activities & Services



 Service	
• Presider of session "Applications of advanced fabrication", CLEO 2025, Long Beach, USA	
 Membership	
• Student Member, Acoustical Society of America (ASA)	📅 Dec-2018 – Dec-2023
• Member, Optica (Formerly Optical Society of America)	📅 Mar-2024 – Now
 Reviewer	
<ul style="list-style-type: none"> • The Journal of the Acoustical Society of America • Nature Communications • Science Advances • Physical Review Applied • Physical Review Research • International Journal of Extreme Manufacturing • Applied Physics Letters • Optics Express 	<ul style="list-style-type: none"> • Optical Materials Express • Noise Control Engineering Journal • Research • Journal of Applied Physics • Journal of Physics D: Applied Physics • IEEE Open Journal of Ultrasonics Ferroelectrics and Frequency Control

Honors & Awards



Simowitz Award	📅 April-2025
The Pennsylvania State University, Graduate Program in Acoustics	
The Joseph and Irene Tobis Graduate Fellowship	📅 Jan-2023
The Pennsylvania State University, Graduate Program in Acoustics	
Eugene J. Skudrzyk Award	📅 May-2021
The Pennsylvania State University, Graduate Program in Acoustics	