# Shuyang Cao | Résumé

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## Research Interest

Nonequilibrium Dynamics, Dark Matter, Gravitational Wave, Quantum Information

## Education

**University of Pittsburgh** — **Pittsburgh**
Ph.D. in *Physics* — *Aug. 2019 – present*
GPA 3.982/4
Advisor: Prof. Adam K Leibovich,Prof. Daniel Boyanovsky

**University of Pittsburgh** — **Pittsburgh**
M.S. in *Physics* — *Aug. 2019 – May. 2020*

**Peking University** — **Beijing**
B.S. in *Electronic and Information Science and Technology* — *Sep. 2014 – Jul. 2018*
Advisor: Prof. Xiaoji Zhou

**Hong Kong University of Science and Technology** — **Hong Kong**
*Non-degree Undergraduate Exchange Program* — *Sep. 2016 – Dec. 2016*
TGA: 4.060/4.3

### Summer Schools

**51st SLAC Summer Institute (SSI 2023)** — **SLAC**
*Program topic* : *Maching learning across the frontiers* — *Aug. 7–18, 2023*
*Poster presentation* : *Dynamics of Neutral (pseudo-)scalar Field Mixing*

**Qiskit Global Summer School 2023** — **Online**
*Program topic* : *Theory To Implementation* — *Jul. 17-28, 2023*
*Certification* : *Qiskit Global Summer School 2023 - Quantum Excellence*

**The 3rd Condensed Matter Summer School** — **University of Minnesota**
*Program topic* : *Dynamics and Quantum Information in Many-body Systems* — *Jun. 12-21, 2023*
*Poster presentation* : *Axionic Responses in Materials Meet Cosmic Axions*

**Michigan Cosmology Summer School 2023** — **Univeresity of Michigan**
*Jun. 5-9, 2023*

## Selected Honors and Awards

**Andrew W. Mellon Predoctoral Fellow** — **Academic year 2023-2024**
*University-wide fellowship awarded to doctoral students of exceptional promise and ability across the disciplines.*

**Dietrich School of Arts and Sciences Summer Fellowship** — **Summer. 2020**
*awarded to top first-year graduate students in good academic standing*

## Talks and Presentations

**2023 Annual Meeting of the APS Mid-Atlantic Section** — **Newark, US**
*Title : Field Mixing of Axions in Early Universe and in Condensed Matter* — *Nov. 4, 2023*

**Phenomenology 2023 Symposium** — **Pittsburgh, U.S.**
*Title : Imprints of Axion's Evolution in CMB* — *May 9, 2023*

**APS April Meeting 2023** — **Online**
*Title : Brownian Axion-like Particles in Cosmic Microwave Background* — *Apr. 25, 2023*

**The 5th Neighborhood Workshop** — **State College, U.S.**
*Title : Chern-Simons Condensate from Misaligned Axions* — *Apr. 6, 2023*

**2022 Annual Meeting of the APS Mid-Atlantic Section** — **State College, U.S.**
*Title : Brownian Axion-like Particles* — *Dec. 3, 2022*

## Teaching Assistant

- Introduction to Laboratory Physics, Fall 2019, University of Pittsburgh
- Introduction to Laboratory Physics, Spring 2020, University of Pittsburgh
- Introduction to Laboratory Physics, Fall 2020, University of Pittsburgh
- Introduction to Laboratory Physics, Spring 2021, University of Pittsburgh
- Introduction to Physics 1, Summer 2021, University of Pittsburgh
- Introduction to Laboratory Physics, Fall 2021, University of Pittsburgh
- Introduction to Laboratory Physics, Spring 2022, University of Pittsburgh
- Introduction to Laboratory Physics, Lead TA, Fall 2022, University of Pittsburgh

## Publications


[1] ***Shuyang Cao*** and Daniel Boyanovsky. "Effective field theory of particle mixing". In: (Oct. 2023). arXiv: 2310.17070 [hep-ph].

[2] ***Shuyang Cao***, Wenjie Huang, and Daniel Boyanovsky. "Dynamics of axion-neutral pseudoscalar mixing". In: *Phys. Rev. D* 108 (2 July 2023), p. 025012. DOI: 10.1103/PhysRevD.108.025012.

[3] ***Shuyang Cao*** and Daniel Boyanovsky. "Chern Simons condensate from misaligned axions". In: *Phys. Rev. D* 107 (8 Apr. 2023), p. 083531. DOI: 10.1103/PhysRevD.107.083531.

[4] ***Shuyang Cao*** and Daniel Boyanovsky. "Nonequilibrium dynamics of axionlike particles: The quantum master equation". In: *Phys. Rev. D* 107 (6 Mar. 2023), p. 063518. DOI: 10.1103/PhysRevD.107.063518.

[5] ***Shuyang Cao*** and Daniel Boyanovsky. "Brownian axionlike particles". In: *Phys. Rev. D* 106 (12 Dec. 2022), p. 123503. DOI: 10.1103/PhysRevD.106.123503.

[6] ***Shuyang Cao***, Pengju Tang, Xinxin Guo, Xuzong Chen, Wei Zhang, and Xiaoji Zhou. "Extraction and identification of noise patterns for ultracold atoms in an optical lattice". In: *Opt. Express* 27.9 (Apr. 2019), pp. 12710–12722. DOI: 10.1364/OE.27.012710.

[7] Dong Hu, Lin-Xiao Niu, Jia-Hua Zhang, Xin-Hao Zou, ***Shu-Yang Cao***, and Xiao-Ji Zhou. "Coupled Two-Dimensional Atomic Oscillation in an Anharmonic Trap". In: *Chinese Physics Letters* 34.7 (July 2017), p. 076701. DOI: 10.1088/0256-307x/34/7/076701.