

# Shuyang Cao | Résumé

📞 +1 (412) 628 2145 • ✉ shuyang.cao@pitt.edu  
🌐 <https://caosy.github.io> • 🔄 CaoSY • 🆔 0000-0001-6411-454X

## Research Interest

---

Nonequilibrium Dynamics, Gravitational Wave, Dark Matter, Axion Electrodynamics

## Education

---

<b>University of Pittsburgh</b> Ph.D. in <i>Physics</i> GPA 3.982/4 Advisor: Prof. <b>Adam K Leibovich</b> , Prof. <b>Daniel Boyanovsky</b>	<b>Pittsburgh</b> <i>Aug. 2019 – present</i>
<b>University of Pittsburgh</b> M.S. in <i>Physics</i>	<b>Pittsburgh</b> <i>Aug. 2019 – May. 2020</i>
<b>Peking University</b> B.S. in <i>Electronic and Information Science and Technology</i> Advisor: Prof. <b>Xiaoji Zhou</b>	<b>Beijing</b> <i>Sep. 2014 – Jul. 2018</i>
<b>Hong Kong University of Science and Technology</b> <i>Non-degree Undergraduate Exchange Program</i> TGA: 4.060/4.3	<b>Hong Kong</b> <i>Sep. 2016 – Dec. 2016</i>

## Selected Honors and Awards

---

<b>Andrew W. Mellon Predoctoral Fellow</b> <i>University-wide fellowship awarded to doctoral students of exceptional promise and ability across the disciplines.</i>	<b>Academic year 2023-2024</b>
<b>Dietrich School of Arts and Sciences Summer Fellowship</b> <i>awarded to top first-year graduate students in good academic standing</i>	<b>Summer. 2020</b>

## Talks and Presentations

---

<b>Phenomenology 2023 Symposium</b> <i>Title: Imprints of Axion's Evolution in CMB</i>	<b>Pittsburgh, U.S.</b> <i>May 9, 2023</i>
---	---

**APS April Meeting 2023***Title: Brownian Axion-like Particles in Cosmic Microwave Background***Online***Apr. 25, 2023***The 5th Neighborhood Workshop***Title: Chern-Simons Condensate from Misaligned Axions***State College, U.S.***Apr. 6, 2023***2022 Annual Meeting of the APS Mid-Atlantic Section***Title: Brownian Axion-like Particles***State College, U.S.***Dec. 3, 2022*

## Teaching Assistant

---

- PHYS 0212 Introduction to Laboratory Physics, Fall 2019, University of Pittsburgh
- PHYS 0212 Introduction to Laboratory Physics, Spring 2020, University of Pittsburgh
- PHYS 0212 Introduction to Laboratory Physics, Fall 2020, University of Pittsburgh
- PHYS 0212 Introduction to Laboratory Physics, Spring 2021, University of Pittsburgh
- PHYS 0110 Introduction to Physics 1, Summer 2021, University of Pittsburgh
- PHYS 0212 Introduction to Laboratory Physics, Fall 2021, University of Pittsburgh
- PHYS 0212 Introduction to Laboratory Physics, Spring 2022, University of Pittsburgh
- PHYS 0212 Introduction to Laboratory Physics, Fall 2022, University of Pittsburgh

## Publications

---

- [1] **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](https://doi.org/10.1103/PhysRevD.107.083531).
- [2] **Shuyang Cao**, Wenjie Huang, and Daniel Boyanovsky. “Dynamics of axion-neutral pseudoscalar mixing”. In: (Apr. 2023). arXiv: [2304.13884](https://arxiv.org/abs/2304.13884) [hep-ph].
- [3] **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](https://doi.org/10.1103/PhysRevD.107.063518).
- [4] **Shuyang Cao** and Daniel Boyanovsky. “Brownian axionlike particles”. In: *Phys. Rev. D* 106 (12 Dec. 2022), p. 123503. DOI: [10.1103/PhysRevD.106.123503](https://doi.org/10.1103/PhysRevD.106.123503).
- [5] **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](https://doi.org/10.1364/OE.27.012710).
- [6] 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](https://doi.org/10.1088/0256-307x/34/7/076701).