

# JYOTIRMAI SINGH

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## Education

<b>Stanford University</b> Ph.D. Physics M.S. Physics	2019 – Present <i>Anticipated Graduation: 05/2026</i> 2022
<b>University of California, Berkeley</b> B.A. Physics <i>Highest Honors in Physics, Highest Distinction in General Scholarship, 2018 Phi Beta Kappa</i>	2015 – 2019 GPA 3.99/4.00

## Research Experience

<b>Graduate Student Researcher, Stanford University</b> <i>Advisor: Kent Irwin</i>	09/2019 – Present Stanford, CA
<ul style="list-style-type: none"><li>Building experiment to measure quantum backaction noise of DC SQUID sensors in the MHz frequency range.</li><li>Created superconducting resonators with quality factors <math>Q \sim 10^5 - 10^6</math> for axion dark matter searches.</li><li>Developing MHz scale high Q superconducting stripline resonators for quantum memory applications in collaboration with Dave Schuster.</li></ul>	
<b>Undergraduate Researcher, Lawrence Berkeley National Laboratory</b> <i>Advisors: Gabriel Orebi Gann</i>	11/2015 – 05/2019 Berkeley, CA
<ul style="list-style-type: none"><li>Developed Python analysis pipelines to incorporate uncertainties in particle position/energy reconstruction methods for neutrons linked to atmospheric neutrinos at the Sudbury Neutrino Observatory.</li></ul>	
<b>Undergraduate Researcher, SuperCDMS Collaboration, UC Berkeley</b> <i>Advisor: Matt Pyle</i>	06/2018 – 05/2019 Berkeley, CA
<ul style="list-style-type: none"><li>Implemented C++ algorithms in the G4CMP package to simulate new phonon physics such as anharmonic decay to improve modeling quality of the SuperCDMS Monte Carlo package.</li></ul>	

## Skills

<b>Programming</b>	Python, Java, C++
<b>Software</b>	SolidWorks, COMSOL, Altium, Git
<b>Experimental Methods</b>	Superconducting Circuits, Cryogenics (Dilution Refrigerator, Liquid Helium), Laboratory Electronics (Oscilloscope, VNA, Lock-In Amplifiers, Waveform Generators), Machining Tools (CNC, Lathe, Bandsaw), Vacuum Equipment, Residual Gas Analyzer, Piezoelectric Positioners

## Awards/Honours

Quad Fellowship (\$50,000)	2023-24
Student Presentation Award - APS Group on Instrument & Measurement Science	2021
Isidore Pomerantz Scholarship (\$1000) - Department of Physics, UC Berkeley	2018
Berkeley Physics Undergraduate Research Scholar - Department of Physics, UC Berkeley	2017

## Peer-Reviewed Publications ([Google Scholar](#))

- G4CMP: Condensed Matter Physics Simulation Using the Geant4 Toolkit**  
M. H. Kelsey et al. [Nuclear Inst. and Methods in Physics Research, A 1055, 168473 \(2023\)](#)

2. **Quantum metrology of low frequency electromagnetic modes with frequency upconverters**  
S. E. Kuenstner, E. C. van Assendelft, S. Chaudhuri, H. M. Cho, J. Corbin, S.W. Henderson, F. Kadribasic, D. Li, A. Phipps, N.M. Rapidis, M. Simanovskaia, **J. Singh**, C. Yu, K. D. Irwin, [arXiv:2210.05576](https://arxiv.org/abs/2210.05576) (2022)
3. **Projected Sensitivity of DMRadio-m<sup>3</sup>: A Search for the QCD Axion Below 1  $\mu$ eV**  
L. Brouwer *et al.* (DMRadio Collaboration), [Phys. Rev. D 106, 103008](https://arxiv.org/abs/2203.10308) (2022)
4. **Proposal for a definitive search for GUT-scale QCD axions**  
L. Brouwer *et al.* (DMRadio Collaboration), [Phys. Rev. D 106, 112003](https://arxiv.org/abs/2203.11203) (2022)
5. **Measurement of neutron production in atmospheric neutrino interactions at the Sudbury Neutrino Observatory**  
B. Aharmim *et al.* (SNO Collaboration), [Phys. Rev. D 99, 112007](https://arxiv.org/abs/1903.11207) (2019)

## Invited Talks & Conference Presentations

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|---|---------|
| 1. <b>Measurements of dc SQUID Backaction Noise and Correlations in the kHz-MHz Range</b><br>APS Global Physics Summit 2025     | 03/2025 |
| 2. <b>From Darkness to Light: The Search for Axion Dark Matter</b><br>University of San Francisco Physics Department Colloquium | 10/2024 |
| 3. <b>LC Resonators in the DM Radio 50L Experiment</b><br>APS April Meeting 2021  | 04/2021 |
| 4. <b>Precision Metrology with Radiofrequency Quantum Upconverters</b><br>APS March Meeting 2021                                | 03/2021 |

## Other Publications

1. **Investing in the future of Indian Science**  
J. Singh, P. Shah, [Observer Research Foundation](https://observerresearchfoundation.org/) (2022)

## Professional Affiliations

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|---|----------------|
| 1. <b>Q-NEXT National Quantum Information Science Research Center</b> | 2021 – Present |
| 2. <b>Kavli Institute for Particle Astrophysics and Cosmology</b>     | 2021 – Present |

## Service

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|---|-----------------------------------|
| <b>Mentorship Chair</b><br><i>Phi Beta Kappa Northern California Chapter</i>  | 08/2022 – 08/2023<br>Stanford, CA |
| · Established the first ever mentorship program for PBK's Northern CA chapter, helping young professionals expand their networks and get guidance from experienced PBK members. |                                   |
| <b>Councilor, Natural Sciences Representative</b><br><i>Stanford Graduate Student Council</i>   | 05/2021 – 04/2022<br>Stanford, CA |
| · Achieved significant concessions on affordability, including fully subsidised health insurance for PhD students.  |                                   |

## Teaching Experience

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|---|-----------------------------------|
| <b>Teaching Assistant, Stanford University Department of Physics</b><br><i>PHYS 45: Thermodynamics and Optics</i> | 09/2023 – 12/2023<br>Stanford, CA |
| <b>Teaching Assistant, Stanford University Department of Physics</b><br><i>PHYS 43: Electricity and Magnetism</i> | 03/2020 – 06/2020<br>Stanford, CA |
| <b>Tutor, Computer Science Mentors at Berkeley</b><br><i>CS 61B: Data Structures</i>                              | 02/2017 – 05/2017<br>Berkeley, CA |