

JYOTIRMAI SINGH

Stanford, California ♦ joesingh@stanford.edu ♦ (510) 589-5898

Education

Stanford University Ph.D. Physics M.S. Physics	2019 – Present <i>Anticipated Graduation: 05/2026</i> 2022
University of California, Berkeley 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

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

Skills

Programming	Python, Java, C++
Software	SolidWorks, COMSOL, Altium, Git
Experimental Methods	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 \(2022\)](#)
3. **Projected Sensitivity of DMRadio-m³: A Search for the QCD Axion Below 1 μ eV**
L. Brouwer *et al.* (DMRadio Collaboration), [Phys. Rev. D 106, 103008 \(2022\)](#)
4. **Proposal for a definitive search for GUT-scale QCD axions**
L. Brouwer *et al.* (DMRadio Collaboration), [Phys. Rev. D 106, 112003 \(2022\)](#)
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 \(2019\)](#)

Invited Talks & Conference Presentations

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|---|---------|
| 1. From Darkness to Light: The Search for Axion Dark Matter
University of San Francisco Physics Department Colloquium | 10/2024 |
| 2. LC Resonators in the DM Radio 50L Experiment
APS April Meeting 2021 | 04/2021 |
| 3. Precision Metrology with Radiofrequency Quantum Upconverters
APS March Meeting 2021 | 03/2021 |

Other Publications

1. **Investing in the future of Indian Science**
J. Singh, P. Shah, [Observer Research Foundation \(2022\)](#)

Professional Affiliations

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

Service

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|---|-----------------------------------|
| Mentorship Chair
<i>Phi Beta Kappa Northern California Chapter</i> | 08/2022 – 08/2023
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. | |
| Councilor, Natural Sciences Representative
<i>Stanford Graduate Student Council</i> | 05/2021 – 04/2022
Stanford, CA |
| · Achieved significant concessions on affordability, including fully subsidised health insurance for PhD students. | |

Teaching Experience

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