JYOTIRMAI SINGH

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Education

Stanford University 2019 — Present
Ph.D. Physics
M.S. Physics 2022

University of California, Berkeley 2015 — 2019
B.A. Physics GPA 3.99/4.00
Highest Honors in Physics, Highest Distinction in General Scholarship, 2018 Phi Beta Kappa

Research Experience

Graduate Student Researcher, Stanford University 09/2019 — Present
Advisor: Kent Irwin *Stanford, CA*

- 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 11/2015 — 05/2019
Advisors: Gabriel Orebi Gann *Berkeley, CA*

- 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 06/2018 — 05/2019
Advisor: Matt Pyle *Berkeley, CA*

- 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)

1. **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, Phys. Rev. Research 7, 013281 (2025)

2. **Noise limits for dc SQUID readout of high-Q resonators below 300 MHz**
V. Ankel *et al.* arXiv:2504.20398 (2025)

3. **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)

4. **Projected Sensitivity of DMRadio-m^3: A Search for the QCD Axion Below $1\ \mu$eV**
L. Brouwer *et al.* (DMRadio Collaboration), Phys. Rev. D 106, 103008 (2022)

5. **Proposal for a definitive search for GUT-scale QCD axions**
L. Brouwer *et al.* (DMRadio Collaboration), Phys. Rev. D 106, 112003 (2022)

6. **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

1. **Measurements of dc SQUID Backaction Noise and Correlations in the kHz-MHz Range** 03/2025
APS Global Physics Summit 2025

2. **From Darkness to Light: The Search for Axion Dark Matter** 10/2024
University of San Francisco Physics Department Colloquium

3. **LC Resonators in the DM Radio 50L Experiment** 04/2021
APS April Meeting 2021

4. **Precision Metrology with Radiofrequency Quantum Upconverters** 03/2021
APS March Meeting 2021

Other Publications

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

Professional Affiliations

1. **Q-NEXT National Quantum Information Science Research Center** 2021 — Present

2. **Kavli Institute for Particle Astrophysics and Cosmology** 2021 — Present

Service

Mentorship Chair 08/2022 —08/2023
Phi Beta Kappa Northern California Chapter *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 05/2021 — 04/2022
Stanford Graduate Student Council *Stanford, CA*

· Achieved significant concessions on affordability, including fully subsidised health insurance for PhD students.

Teaching Experience

Teaching Assistant, Stanford University Department of Physics 09/2023 — 12/2023
PHYS 45: Thermodynamics and Optics *Stanford, CA*

Teaching Assistant, Stanford University Department of Physics 03/2020 — 06/2020
PHYS 43: Electricity and Magnetism *Stanford, CA*

Tutor, Computer Science Mentors at Berkeley 02/2017 — 05/2017
CS 61B: Data Structures *Berkeley, CA*