# 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*

- Developing high Q ($\sim 10^6$) LC resonators in the MHz range for the DM Radio Experiment.
- Fabricating novel quantum sensors for electromagetic signals below 300 MHz.

**Undergraduate Researcher, Lawrence Berkeley National Laboratory** 11/2015 — 05/2019
*Advisor: Gabriel Orebi Gann* *Berkeley, CA*

- Studied the optical properties of Tetraphenyl Butadiene (TPB) in the VUV spectrum in liquid argon (LAr) scintillator for future LArTPC experiments in Honours Thesis.
- Measured neutron production from atmospheric neutrino interactions at the Sudbury Neutrino Observatory.
- Produced new analysis code that enabled simultaneous propagation of uncertainties in position/energy resolutions for low and high energy regimes.

**Undergraduate Researcher, SuperCDMS Collaboration, UC Berkeley** 06/2018 — 05/2019
*Advisor: Matt Pyle* *Berkeley, CA*

- Developed algorithms to simulate new phonon physics in the SuperCDMS Monte Carlo, such as surface reflection downconversion.
- Optimised SuperCDMS Monte Carlo by implementing diffusive propagation of phonons to achieve substantial speedup.

## AWARDS/HONOURS

Quad Fellowship 2023-24
Student Presentation Award - APS Group on Instrument & Measurement Science 2021
Isidore Pomerantz Scholarship - Department of Physics, UC Berkeley 2018
Berkeley Physics Undergraduate Research Scholar - Department of Physics, UC Berkeley 2017
Dean's Honours List - UC Berkeley 2015-18
Kraft Award for Freshmen - UC Berkeley 2015

## PEER-REVIEWED PUBLICATIONS

1. **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-m$^3$: A Search for the QCD Axion Below $1\ \mu$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)

## SCIENTIFIC TALKS

1. **LC Resonators in the DM Radio 50L Experiment** 04/2021
   APS April Meeting 2021
2. **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

## SKILLS

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|---|---|
| **Programming Languages** | Python, Java, C++, HTML/CSS |
| **Natural Languages** | Native: English, Hindi<br>Intermediate Proficiency: French |
| **Tools** | Git, Vim, ROOT, Mathematica, LabVIEW, LaTeX, SolidWorks |

## SERVICE

**Mentorship Chair** 08/2022 — Present
*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*

· Advocated for the interests of natural sciences and international graduate students.
· Achieved significant concessions on affordability, including fully subsidised health insurance for PhD students across all departments.

## TEACHING EXPERIENCE

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

· Teaching Assistant for PHYS 43 taught by Prof. Mark Kasevich.

**Grader, UC Berkeley Department of Physics** 03/2018 — 05/2018
*PHYS 5B: Introductory Electromagnetism, Waves, and Optics* *Berkeley, CA*

· Graded problem sets for Physics 5B, taught by Prof. Jonathan Wurtele.

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

- Tutor for UC Berkeley's introductory Data Structures class, taught by Prof. Josh Hug.
- Held weekly sessions which involved presenting course topics and helping students with problems and conceptual questions.