

# JYOTIRMAI SINGH

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## EDUCATION

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

## RESEARCH EXPERIENCE

|   |                     |
|---|---------------------|
| <b>Graduate Student Researcher, Stanford University</b>   | 09/2019 – Present   |
| <i>Advisor: Kent Irwin</i>  | <i>Stanford, CA</i> |
| <ul style="list-style-type: none"><li>Developing high Q (<math>\sim 10^6</math>) LC resonators in the MHz range for the DM Radio Experiment.</li><li>Fabricating novel quantum sensors for electromagnetic signals below 300 MHz.</li></ul>   |                     |
| <b>Undergraduate Researcher, Lawrence Berkeley National Laboratory</b>  | 11/2015 – 05/2019   |
| <i>Advisor: Gabriel Orebi Gann</i>  | <i>Berkeley, CA</i> |
| <ul style="list-style-type: none"><li>Studied the optical properties of Tetraphenyl Butadiene (TPB) in the VUV spectrum in liquid argon (LAr) scintillator for future LArTPC experiments in Honours Thesis.</li><li>Measured neutron production from atmospheric neutrino interactions at the Sudbury Neutrino Observatory.</li><li>Produced new analysis code that enabled simultaneous propagation of uncertainties in position/energy resolutions for low and high energy regimes.</li></ul> |                     |
| <b>Undergraduate Researcher, SuperCDMS Collaboration, UC Berkeley</b>   | 06/2018 – 05/2019   |
| <i>Advisor: Matt Pyle</i>   | <i>Berkeley, CA</i> |
| <ul style="list-style-type: none"><li>Developed algorithms to simulate new phonon physics in the SuperCDMS Monte Carlo, such as surface reflection downconversion.</li><li>Optimised SuperCDMS Monte Carlo by implementing diffusive propagation of phonons to achieve substantial speedup.</li></ul>   |                     |

## AWARDS/HONOURS

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|--|---------|
| 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

- 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)
- 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/2204.00001) (2022)

3. **Proposal for a definitive search for GUT-scale QCD axions**  
L. Brouwer *et al.* (DMRadio Collaboration), [Phys. Rev. D 106, 112003 \(2022\)](#)
4. **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. <b>LC Resonators in the DM Radio 50L Experiment</b><br>APS April Meeting 2021                 | 04/2021 |
| 2. <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 \(2022\)](#)

## PROFESSIONAL AFFILIATIONS

- |   |                |
|---|----------------|
| 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 |

## SKILLS

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

## SERVICE

|   |                                   |
|---|-----------------------------------|
| <b>Mentorship Chair</b><br><i>Phi Beta Kappa Northern California Chapter</i>  | 08/2022 – Present<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 |
| · 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

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|--|-----------------------------------|
| <b>Teaching Assistant, Stanford University Department of Physics</b><br><i>PHYS 43: Electricity and Magnetism</i>    | 03/2020 – 06/2020<br>Stanford, CA |
| · Teaching Assistant for PHYS 43 taught by Prof. Mark Kasevich.  |                                   |
| <b>Grader, UC Berkeley Department of Physics</b><br><i>PHYS 5B: Introductory Electromagnetism, Waves, and Optics</i> | 03/2018 – 05/2018<br>Berkeley, CA |
| · Graded problem sets for Physics 5B, taught by Prof. Jonathan Wurtele.  |                                   |
| <b>Tutor, Computer Science Mentors at Berkeley</b><br><i>CS 61B: Data Structures</i>                                 | 02/2017 – 05/2017<br>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.