

JYOTIRMAI SINGH

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EDUCATION

Stanford University Ph.D. Physics	September 2019-Present
University of California, Berkeley B.A. Physics (Phi Beta Kappa)	August 2015-May 2019 GPA 3.99/4.00

RESEARCH EXPERIENCE

Honours Thesis Project, Lawrence Berkeley National Laboratory <i>Undergraduate Researcher</i>	May 2018-Present Berkeley, CA
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- Studying the optical properties of Tetraphenyl Butadiene (TPB) to better understand its behaviour in the VUV spectrum in vacuum and liquid argon (LAr) scintillator.
- Created Monte Carlo simulation for experiment to model optical properties of TPB, such as reflectivity and wavelength shifting.
- Thesis in progress under supervision of Prof. Gabriel Orebi Gann.

SuperCDMS Collaboration, UC Berkeley <i>Undergraduate Researcher</i>	June 2018-Present Berkeley, CA
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- Analysing acoustic and optical phonon behaviour as part of preliminary work concerning new nuclear-recoil detection based higher sensitivity dark matter detector designs.
- 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.

SNO Collaboration, Lawrence Berkeley National Laboratory <i>Undergraduate Researcher</i>	June 2016-May 2018 Berkeley, CA
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- Measured neutron production from atmospheric neutrino interactions at the Sudbury Neutrino Observatory.
- Investigated efficiency of energy fitters and propagated low energy systematic uncertainties through the atmospheric event analysis.
- Combined low and high energy systematic uncertainty propagation to create new analysis code that enables simultaneous propagation of uncertainties in position/energy resolutions for low and high regimes.
- Calibrated atmospheric neutrino event selection criteria to optimise event selection efficiencies.

SNO+ Collaboration, Lawrence Berkeley National Laboratory <i>Undergraduate Researcher</i>	November 2015-June 2016 Berkeley, CA
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- Focused on analytic work regarding the SNO+ detector, primarily on simulations which aid in error analysis and position/energy reconstructions.
- Evaluated multiple bias and resolution characterisations of detector sensitivity to determine which was best for the detector.
- Created a substantially simpler script-based analysis code to assess bias and resolution residuals for a full characterization of particle energies/positions.

AWARDS/HONOURS

<i>Phi Beta Kappa Society</i> (inducted as junior) - UC Berkeley	May 2018
Isadore Pomerantz Scholarship - Department of Physics, UC Berkeley	October 2018
Berkeley Physics Undergraduate Research Scholar - Department of Physics, UC Berkeley	February 2017
Dean's Honours List - UC Berkeley	December 2015–May 2018
Kraft Award for Freshmen - UC Berkeley	December 2015
Silver Medal - British Physics Olympiad	June 2014

PUBLICATIONS

1. **Measurement of neutron production in atmospheric neutrino interactions at the Sudbury Neutrino Observatory**
B. Aharmim *et al.* (SNO Collaboration), arXiv:1904.01148.

SKILLS

Programming Languages	Python, Java, C++, Scheme, R, SQL, HTML/CSS
Languages	Native: English, Hindi Intermediate Proficiency: French Elementary Proficiency: Turkish, Persian
Tools	Git, Vim, ROOT, Mathematica, LabVIEW, \LaTeX

ORGANISATIONAL INVOLVEMENT

Quantum Computing at Berkeley <i>VP of Research Communication</i>	February 2018–Present Berkeley, CA
<ul style="list-style-type: none">Responsible for content on QCB's website focusing on conveying the latest advances in quantum computing to a lay audience.Authored introductory articles on quantum mechanics and computing for the club's membership.Previously taught members about fundamentals of quantum computing such as qubits and gates, with the goal of helping them implement their own N-qubit register.	
Undergraduate Lab at Berkeley <i>Mentor - Particle Physics</i>	October 2017–May 2018 Berkeley, CA
<ul style="list-style-type: none">ULAB is a research lab run entirely by undergraduates who direct their own research projects under guidance from experienced mentors. Winner of the annual Big Ideas @ Berkeley contest in 2017.Advisor for the ULAB particle physics lab. Led a project titled <i>Designing an Electromagnetic Shield to Block Secondary Cosmic Rays</i>, giving students support with detector design and manufacture.	

TEACHING EXPERIENCE

UC Berkeley Department of Physics <i>Reader, PHYS 5B: Introductory Electromagnetism, Waves, and Optics</i>	March 2018–May 2018 Berkeley, CA
<ul style="list-style-type: none">Graded problem sets for Physics 5B, taught by Prof. Jonathan Wurtele.	
Computer Science Mentors at Berkeley <i>Tutor, CS 61B: Data Structures</i>	February 2017–May 2017 Berkeley, CA
<ul style="list-style-type: none">Served as a 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 while answering conceptual questions.Given a 4.7/5 average rating by students.	