

Jacob H. Nie

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PERSONAL INFORMATION

Personal email: jacobnie2008@gmail.com (preferred)

School email: jacobhnie@ucsb.edu

Current residence: Santa Barbara, CA

Age: 20

EDUCATION

Stanford University

Ph.D. Electrical Engineering, 2023–

University of California, Santa Barbara

B. S., Physics, 2020–2023

GPA: 3.98/4.00

EXPERIENCE

Undergraduate researcher, UC Santa Barbara (April 2021–Present)

PI: *Prof. Chenhao Jin*

Research focus: Optical spectroscopy of quantum phases of strongly correlated excitons in WSe₂/WS₂ heterostructures; transport and optical characterization of electronic order in semiconductor moire superlattices

Visiting student, UC Berkeley (June 2021–September 2021)

PI: *Prof. Feng Wang*

Research focus: Fabricating 2D van der Waals heterostructures, and optical spectroscopy of twisted TMD heterostructures.

SELECTED HONORS

Colville-Dearborn Memorial Award (2023)

Worster Summer Research Fellowship (UCSB Department of Physics) (2022)

Barry Goldwater Scholarship: nominee (2022)

USA Physics Olympiad National Team Training Camp Attendee (2019)

USA Physics Olympiad: Gold Medalist (2019)

PUBLICATIONS

- E. C. Regan, Z. Lu, D. Wang, Y. Zhang, T. Devakul, **J. H. Nie**, Z. Zhang, W. Zhao, K. Watanabe, T. Taniguchi, S. Tongay, A. Zettl, L. Fu, F. Wang. Spin transport of a doped Mott insulator in moiré heterostructures. (Submitted)
- R. Xiong, S. B. Brantly, K. Su, **J. H. Nie**, R. Banarjee, H. Ruddick, Z. Zhang, K. Watanabe, T. Taniguchi, S. Tongay, C. Xu, C. Jin. Tunable transient valley-pseudospin orders in a moiré Bose-Hubbard model. (Submitted)
- A. Rossi, J. Zipfel, I. Maity, M. Lorenzon, L. Francaviglia, E. C. Regan, Z. Zhang, **J. H. Nie**, E. Barnard, K. Watanabe, T. Taniguchi, E. Rotenberg, F. Wang, J. Lischner, A. Raja, A. Weber-Bargioni. Anomalous interlayer exciton diffusion in WS₂/WSe₂ moiré heterostructure. (Submitted)
- R. Xiong, **J. H. Nie**, S. B. Brantly, P. Hays, R. Sailus, K. Watanabe, T. Taniguchi, S. Tongay, C. Jin. Bosonic Mott insulator in WSe₂/WS₂ moiré superlattice. *Science* **380**, 860-864 (2023).

PRESENTATIONS

- Many body physics in semiconductor moiré heterostructures.* Honors Thesis Seminar. (May 2023)
- Simulating the Bose-Hubbard model in semiconductor moiré superlattices.* Worster Fellowship Symposium. (Oct. 2022)

SELECTED COURSEWORK

- PHYS 13A,B,C - Honors Experimental Physics (A, A, A-)
- PHYS 101 - Complex Variables (A+)
- PHYS 104 - Advanced Mechanics (A+)
- PHYS 110A - Electromagnetism (A+)
- PHYS 123B - Topics in Condensed Matter Physics (A+)
- PHYS 215A,B,C - Quantum Mechanics* (A+, A+, A+)
- PHYS 223A - Condensed Matter Physics* (A+)
- ECE 162C - Optoelectronic Materials and Devices (A+)

* Graduate course