Vanessa Kwong

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Research Interests

- Optics and transport in two-dimensional van der Waals heterostructure devices

Education

University of California, Riverside *Oct 2020 – Present*
B.S. in Physics (Standard)

Relevant Coursework: Condensed Matter Physics, Computational Physics, Classical Mechanics, Electromagnetism, Electromagnetic Waves, Thermodynamics / Statistical Mechanics, Introductory Computer Science, Introductory Biochemistry, Organic Chemistry

Experience

The Joe Lab at UC Riverside Riverside, CA
Undergraduate Researcher *Oct 2023 – Present*

- Demonstrated expertise in fabricating reliable silicon-based devices through precise patterning and dry transfer of mechanically exfoliated two-dimensional (2D) materials. Trained incoming undergraduates on these techniques, improving lab efficiency and technical skills.
- Conducted optical and electrical measurements and data analyses for novel devices
- Built, used, and set up equipment in new laboratory space, training users on laboratory / cleanroom facility for nanoscale engineering.

UC Riverside Research in Science and Engineering (RISE) Riverside, CA
Undergraduate Researcher *Jun 2024 – Aug 2024*

- Conducted independent research on fabrication and developing platinum contacts and testing quantum transport for transition metal dichalcogenide (TMD) devices
- Presented topic to over 250 multidisciplinary researchers, faculty, and guests.
- Assisted in fabrication of graphene heterostructures for magnetotransport in search of the quantum anomalous Hall effect.
- Completed final report titled "Developing Low Temperature Contacts for TMD Heterostructure Devices"
- Advisor: Prof. Andrew Joe

Events

Students Transforming Through Research (STR) Washington, DC
Undergraduate Advocate *Expected Mar 2025*

- Represent UC Riverside and the University of California system in communicating undergraduate research experience to stakeholder groups at Capitol Hill.

UC Riverside RISE Program Symposium Riverside, CA
Oral Presenter *Aug 2024*

- Oral presentation on low-temperature device measurements and background on platinum contact development for WSe_2 based devices for Hall and transport data

UC Riverside Undergraduate Research Symposium *May 2024*

- Presentation: "Optical Characterization of Two-Dimensional Semiconductor Heterostructures"
- Talk on emerging research within TMD heterostructure devices and their optical measurements, analyses, and relevance in materials science and engineering for future optoelectronics

Projects

Laser Dispersion Calculation Program *Apr 2024*

- Developed and implemented program to relate diffraction grating and placement to dispersion of light from supercontinuum laser by selected wavelength

Mutating AT3G08680 to Determine Functional Redundancy *Mar 2021*

- Determined functionality and redundancy among WFL and KOIN genes by mutagenization and "knocking-out" of related genes and comparing *A. thaliana* phenotypes.

PLTW Biomedical Sciences Capstone Research *Oct 2019 - Jun 2020*

- Independent research on effectiveness of natural preservatives in limiting bacteria growth

Los Angeles County Science and Engineering Fair *Oct 2017 - Mar 2018*

- Research and presentation on effectiveness between common materials of laboratory gloves in preventing bacteria penetration

Skills

Laboratory: Mechanical Exfoliation, Dry Transfer, Sputtering, Atomic Force Microscopy (AFM), Soldering, Optical Path Setup, Electron-beam Evaporation (EBE) & Lithography (EBL), Spectroscopy, Spectrophotometry

Programming: C++, Python, MATLAB, HTML, CSS, JavaScript

Other: LATEX, CAD (KLayout, AutoCAD), Excel

Languages (Spoken): English (Native), Cantonese (Native), Mandarin (Fluent)

Awards

UC Riverside College of Natural & Agricultural Sciences Dean's List

3rd Place Microbiology Senior in LA County Science and Engineering Fair (2018)

References

Dr. Andrew Joe, Assistant Professor of Physics and Astronomy (andrew.joe@ucr.edu)