Qiaochu Wan

qiw74@pitt.edu | https://qiaochuwan.github.io | +1-510-280-442

PhD candidate in 2d material photonics with hands-on experience in 2D semiconductor, optics, and nanofabrication (including PECVD, ALD). Developed high-efficiency coherent nano-laser and computer vision algorithm, discovered new quasi-particle. Proficient in optical, magnetic and electrical measurement of semiconductor device, nanofabrication techniques in clean room and machine learning tools.

EDUCATION

University of Pittsburgh   Nov 2025
Doctor of Philosophy, Physics [GPA: 3.9]

Shanghaitech University/ University of California, Berkeley   Aug 2020
Bachelor of Science, Physics   [GPA: 3.7]
3+1 program for Physics

Relevant Experience

Research Assistant   Aug 2020 - Present
University of Pittsburgh | Pittsburgh
- Fabricated a high-efficiency polariton nano laser(VCSEL) using ALD and PECVD and measured the coherence time with interferometry, achieving an ultra-low threshold with high efficiency on a Silicon chip.

Developed polariton laser working at room temperature using GaAs VCSEL
- Developing a computer vision algorithm based on Mask RCNN and Autoencoder to analyze the microscopic image of 2D material without doing an AFM scan or Photoluminescence, aiming to generalize the algorithm for a wide range of microscopes optical settings.
- Discovered a new quasi-particle in TMD bilayer MOSFET by electrical and optical measurement, studying its electrical properties and prove it as a potential candidate for light-induced superconductor.

Research Assistant   Aug 2019 - Aug 2020
University of California | Berkeley
- Measured the Valley Hall effect in WSe_2/WS_2 hetero-bilayer using polarizer.
- Fabricated bilayer TMD devices using electron-beam lithography and plasma etching for ARPES at Lawrence Berkeley National Laboratory (LBNL).

Research Intern   May 2019 - Jun 2019
University of Oxford, Clarendon Laboratory | Oxford
- Synthesized heavy fermion material and Weyl semi-metal using Bridgman and Bi-flux method
- Fully trained on XRD, magnetron sputtering, and XRR for ARPES at Diamond Light Source.

Research Assistant   Sep 2018 - Jun 2019
Shanghaitech University | Shanghai
- Utilized Q# language to simulate the HHL algorithm for solving linear equations, contributing to foundational work in quantum computing for linear systems.
- Successfully solved 2-by-2 Hermitian matrix equations in Q# and explored hybrid quantum-classical methods to enhance algorithm efficiency.

Research Assistant   Sep 2017 - Sep 2018
Shanghai Advanced Research Institute, Chinese Academy of Sciences | Shanghai
- Simulated the propagation of laser and interaction of two laser beams in the water using FDTD in Matlab
- Applied the method for nonlinear fiber optics to solve the third-order nonlinear effect and water-photon interaction and achieved a well-matched result in a simplified water environment

Core Skills

Data Science & Machine Learning: Computer vision(CNN, SVM, Autoencoder), Tensor Network for machine learning, Data cleaning, Multiple Programming Languages (Matlab, Python, Julia, Q#, JavaScript), Blender
Nanofabrication skills: Optical Lithography, Plasma Enhanced Chemical Vapor Deposition (PECVD), Plassys E-Beam Evaporation System, Plasma Enhanced Atomic Layer Deposition (PE-ALD), Etching, Wire Bonding, Electron Beam Lithography, Spin coat, Atomic Force Microscope (AFM), Scanning Transmission Electron Microscope (STEM), X-Ray Diffractometer (XRD), Surface profiler, Open circuit Helium cooling system
Optical/Cryogenic Skills: Fourier Optics, waveguide design, Laser design, interferometry, optical design, transfer matrix method, optical reflectivity simulation, Optical Path Setup, fluorescence angle resolved technique, Femtosecond laser and streak camera, Optical, magnetic and transport measurement in Helium-temperature and high vacuum cryostat
Research Skills: Condensed matter physics, Semiconductor physics, Many-body physics, Optics, CMOS
Find publication and presentation in https://qiaochuwan.github.io/images/CV.pdf