Qiuyan Li | Curriculum Vitae

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Education

ShanghaiTech University **Shanghai, China**
B.Sc. in Physics *2022–Expected 2026*
GPA: 3.68/4.00. Relevant Coursework: Quantum Mechanics I

University of California, Berkeley **Berkeley, CA, USA**
Exchange Program: Berkeley Physics International Education (BPIE) *Jan 2025 – Jan 2026*
GPA: 3.78/4.00. Relevant Coursework: Quantum Mechanics II (PHYS 137B), Solid State Physics I (PHYS 141A)

Research Experience

Lanzara Group, UC Berkeley / Lawrence Berkeley National Lab **Berkeley, CA, USA**
Undergraduate Researcher *Apr 2025–Present*
Project: Sonification of ARPES Data for Real-Space detection of Charge Density Waves in TaS_2.
Highlight: 1. Unified computational and experimental analysis to reveal emergent order in correlated materials through sonification. 2. Strengthened experimental readiness through hands-on work in sample preparation, vacuum diagnostics, and synchrotron beamline operation

- Developed a Python- and web-based sonification platform that maps ARPES spectra from real-space x–y scans into sound, enabling intuitive differentiation of CDW phases in TaS_2.
- Analyzed spectral data collected at the Advanced Light Source (ALS) Beamline 7 (MAESTRO) to identify different hidden CDW states.
- Prepared Bi2Se3 samples to verify Spin-TOF (spin-resolved ARPES) performance after vacuum break and baking, gaining hands-on experience in vacuum handling and system diagnostics.
- Assisted in 3–4 micro/nano-ARPES beamtime sessions, contributing to sample loading while developing practical familiarity with synchrotron-based measurements.

Zhaoru Sun's Group, ShanghaiTech University **Shanghai, China**
Undergraduate Researcher *Jul 2024–Jan 2025*
Project: Computational Modeling of Antifreeze Proteins (AFPs).
Highlight: Independently rebuilt and adapted a MaSIF-based geometric deep-learning framework, converting a complex biophysical recognition problem into a tractable surface-geometry learning task.

- Vectorized surface geometry of antifreeze proteins using the MaSIF framework to predict Thermal Hysteresis (TH), achieving orders-of-magnitude speedups over Molecular Dynamics simulations.
- Designed and trained geometric CNNs and contrastive models to identify and classify ice-binding surfaces (IBS).
- Explored generative extensions for AFP design, introducing computational strategies that bridge molecular physics and neural representation learning.

Zhongkai Liu's Group, Topology lab ShanghaiTech University **Shanghai, China**
Undergraduate Researcher, Direct supervisor: Dr. Cheng Chen(Professor after Sep. 2024) *Mar 2024–Oct 2024*
Project: Fabrication of 2D WSe_2 Heterostructure Devices.
Highlight: 1. Built foundational experimental expertise in atomically thin materials. 2. Acquired end-to-end proficiency in the exfoliation, transfer, and stacking workflow central to modern 2D material device fabrication

- Performed mechanical exfoliation and optical identification of monolayer WSe_2 flakes ($\sim 10\,\mu m \times 10\,\mu m$) for heterostructure assembly.
- Developed stacking and encapsulation processes with hBN and graphene, enabling tunable device geometries for band-structure and exciton-dynamics measurements.
- Collaborated on optimizing substrate preparation and transfer alignment under O-zone plasma and micro-manipulation setups.

CUPT Laboratory, ShanghaiTech University **Shanghai, China**
Undergraduate Researcher, Supervisors: Prof. Yifan Jiang, Prof. Hao Deng *Nov 2022–Aug 2023*
Project: Experimental and Computational Studies in Classical Dynamics.
Highlight: Early demonstration of quantitative rigor and autonomy in combining experiment, simulation, and data interpretation.

- Constructed an experimental tracking system for isotropic objects, applying Fourier transforms to analyze motion patterns.
- Simulated the dynamics of a magnetic Euler pendulum and a rolling cylinder on an arrester bed to compare theoretical and experimental behaviors.
- Implemented fractal dimension extraction via image boundary recognition and contour counting for pattern-formation analysis.

Technical Skills

Programming: Python, MATLAB, Linux, TensorFlow, PyTorch, JavaScript, CSS, HTML, Mathematica, Quantum ESPRESSO

Experimental: 2D material device fabrication, ARPES, AFM, Optical Spectroscopy

Tools: Git, LaTeX, HPC Clusters

Awards

2024: Merit Student (Top 15%), ShanghaiTech University

2023: Merit Student (Top 15%), ShanghaiTech University

2023: First Prize, China Undergraduate Physics Tournament (Core Team Memeber)

Activities

Social Practice **Jingxian, Anhui, China**
Awardee, "Zhixing Cup" Shanghai Social Practice Competition Advanced Individual *Summer 2024*
Led a 10-member team to survey left-behind students, designed localized CDDQ-based questionnaires, and coordinated field data collection. Participated in **voluntary teaching.**

Industry Practice **Shanghai, China**
Participant, New Energy Vehicle (NEV) Industry Field Study *Summer 2024*
Visited BYD, SAIC, Infineon, and Koboda to observe the NEV supply chain and automation. Analyzed battery/semiconductor integration and summarized findings in a brief report.

Sports Activity **Shanghai, China**
Finisher, Big K 10K Run *Oct 2024*
Completed the Big K 10K race held in Shanghai.

Sports Activity **San Francisco, CA, USA**
Finisher, Bay to Breakers Run *May 2025*
Completed the Bay to Breakers 12K race in San Francisco.

Miscellaneous

Github repos:
- CUPT Programs `https://github.com/Theddeus/IYPT_or_CUPT2023`
- IBP Program (Access availabe upon reasonable request) `https://github.com/Theddeus/IBP`
- Live ARPES data sonification (Access availabe upon reasonable request) `https://github.com/Theddeus/Live_ARPES`

Links to websites developed:
- Breakthrough Discovery `https://www.breakthroughdiscovery.org`
- Sleepy Cloud `https://finance.tgetdse.com`