

## EDUCATION

### The University of Chicago, Chicago, IL

*Bachelor of Science in Physics, Expected June 2028*

*Bachelor of Science in Molecular Engineering, Expected June 2028*

*- 4+1 Scholars Program, Masters of Engineering in Quantum Engineering, Expected June 2029*

Relevant Coursework: QuantumLab; Intermediate Quantum Engineering (Currently Enrolled); Machine Learning and Artificial Intelligence for Molecular Discovery and Engineering (Currently Enrolled); Principles of Engineering Analysis I-II; Molecular Engineering Transport Phenomena (Currently Enrolled)

## RELEVANT EXPERIENCE

### Grainger

*Data Science Apprentice*

Lake Forest, IL

Jun 2026 - Aug 2026

- Processed and structured large multi-variable datasets in SQL and R, building reusable pipelines to prepare data for ML analysis
- Applied k-means clustering, PCA, and Firth logistic regression to large-scale behavioral datasets to identify patterns and predict outcomes for the customer base
- Built a Python-based data visualization pipeline (Streamlit) to surface trends in large multi-variable datasets, enabling faster pattern recognition

### Self-Learning Robotic Epitaxy Project | Yang Laboratory, University of Chicago

*Undergraduate Research Assistant*

Chicago, IL

Feb 2026 - Present

- Contribute to the development of AI-driven robotic molecular beam epitaxy (MBE) system for manufacturing superconducting quantum materials and devices, combining materials science with machine learning
- Developed a Python script to enhance analysis of RHEED images by mapping pixel intensity to a false-color spectrum, improving pattern visibility for MBE process evaluation
- Engineered a Python computer-vision pipeline for automated RHEED analysis of 3,000+ frame MBE growth sequences, integrating VGG16 feature extraction, PCA/Ward clustering, NMF, and changepoint detection to identify evolving surface states and statistically characterize growth transitions.

### Physics Research | Hunt Laboratory, University of Chicago

*Undergraduate Researcher*

Chicago, IL

Feb 2026 - Present

- Designed and built an embedded control system using an Arduino microcontroller to drive a stepper motor with precision, gaining hands-on experience in hardware programming and electromechanical systems
- Engineered and modeled a hydrodynamic device that generates surface waves through rotational motion, exploring fluid-structure interaction principles with applications in wave energy and physical simulation

## PROJECTS

### Quantum Machine Learning (QML) Project | UChicago Quantum Society

- Co-authored a technical introduction to QML bridging quantum computing and machine learning, contributing sections on the Quantum Approximate Optimization Algorithm, hybrid quantum-classical algorithms, and barren plateaus in optimization
- Participated in a student-run organization dedicated to advancing understanding of quantum science and technology through lectures, workshops, and research engagement

### Controlled Wave Generator | Hunt Lab, University of Chicago

- Modeled a floating wave-generating device in Fusion 360 and fabricated it using a resin 3D printer
- Programmed an ATtiny85 microcontroller to drive a DC motor at a controlled RPM to produce repeatable wave patterns
- Utilized a color wheel beneath a water-filled tub to enhance wave visibility for outreach demonstrations

### EL Enrollment and Non-EL Discipline Rates Analysis | University of Chicago

- Merged and analyzed CRDC and CCD administrative datasets in R, building an analytic sample of 180,490 school-year observations across four years
- Applied OLS regression (linear, quadratic, fixed-effects) to examine the association between EL enrollment share and non-EL suspension rates, controlling for poverty and school size
- Presented findings via an in-class poster presentation and a formal research report

## AWARDS & HONORS

- Hispanic Scholarship Fund Scholar (2024)
- UChicago Dean's Scholar (2024)

## SKILLS

**Experimental:** Optical and laser alignment, beam steering, polarization optics, oscilloscopes, data acquisition, quantum optics, RHEED characterization, experimental apparatus design, embedded electronics, 3D printing, rapid prototyping

**Computational:** Python, R, SQL, Java, LaTeX, CAD/Fusion 360, Arduino, Git, Streamlit

**Machine Learning & Data Science:** PCA, k-means clustering, logistic regression, Firth logistic regression, lasso regression, ordinary logistic regression, feature engineering, dimensionality reduction, data visualization