

Connor Blake
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EDUCATION

University of Chicago

B.S. Quantum Engineering (minor CS), expected Jun 2026

GPA: 3.93

Selected Coursework

- PhD-level Physics/Chemistry: Adv. Electrodynamics I & II; Adv. Statistical Mechanics; Semiconductor Physics; Soft Condensed Matter Physics; Machine Learning in Chemistry
- PhD-level Quantum: Quantum Molecular & Materials Modeling; Adv. Quantum Engineering; Adv. Quantum Information and Computation
- CS & Math: Systems Programming I & II; Computer Architecture; Honors Discrete Math; Probability Models; Applied Stochastic Processes; Math for Quantum Mechanics (functional analysis & PDEs)

RESEARCH & WORK EXPERIENCE

Undergraduate Researcher, Prof. Liang Jiang's Group

Jun 2024–present

UChicago Pritzker School of Molecular Engineering, Chicago, IL

- Developing quantum optics theory and simulations (JAX) for improved hybrid qubit-oscillator control
- Developed pulse-level optimal-control tools for open quantum systems in JAX ([link](#))

Undergraduate Researcher, Prof. Jörn Dunkel's Group

Jun 2025–present

MIT Department of Mathematics, Cambridge, MA

- Developing variationally optimal scheme for training and sampling score-matching diffusion models
- Developing tools to learn coarse-grained Cahn-Hilliard dynamics from phase-separating MD simulations

Quantum Circuit Design Intern

Jun 2024–Aug 2024

Atlantic Quantum (acquired by Google Quantum AI), Cambridge, MA

- Achieved >10x speed-up in Lindblad cQED readout and gate simulations using JAX, multiprocessing
- Automated Layout-vs-Schematic and Design Rules Checking for superconducting quantum circuit layout workflow using GDSFactory, KLayout
- Contributed 9,000+ lines of code (Python, Ruby) during 5 sprints

Undergraduate Researcher, Prof. Shuolong Yang's Group

Nov 2022–Nov 2024

UChicago Pritzker School of Molecular Engineering, Chicago, IL

- Wrote & maintained 7,000+ lines of MATLAB, C, Python to automate a thin-film deposition system that uses a custom Bayesian machine learning algorithm to learn recipe for parametric beamsplitter fabrication
- Wrote interfaces and integrated lasers, manipulators, and sensors into system to be controlled autonomously; designed and manual/CNC machined precision optical and thermal components
- Design is patent-pending, paper is published in *npj Computational Materials*

Computational Physics Intern

Jul 2023–Sep 2023

Argonne National Laboratory Center for Nanoscale Materials, Lemont, IL

- Developed tight-binding model and simulations for a quasicrystal enabling new hierarchical analysis
- Simulated adsorption of CO on copper using QuantumESPRESSO for potential realization with STM

PUBLICATIONS

Zheng, Y.B., **Blake, C.**, Mravac, L. et al. A self-driving physical vapor deposition system making sample-specific decisions on the fly. *npj Comput Mater* 11, 327 (2025). <https://doi.org/10.1038/s41524-025-01805-0>

MANUSCRIPTS IN PREPARATION

Blake, C., Zheng, G., Lee, G., Jiang, L. “Differentiable Optimization of Hybrid Qubit-Oscillator Control Pulses.” *In preparation*.

Blake, C., Cohen A.E., Dunkel, J. “Lagrangian Diffusion Models” *In preparation*.

PRESENTATIONS

Blake, C., “Electronic structure and self-similarity in the Spectre aperiodic tiling” (Talk). Argonne National Laboratory Center for Nanoscale Materials Theory and Modeling Seminar, Lemont, IL, September 2023.

Zheng, B.Y., Mravac, L. , **Blake, C.**, “Machine learning-aided automated molecular beam epitaxy” (Poster). UChicago Undergraduate Research Symposium, Chicago, IL, May 2023.

HONORS & AWARDS

Barry Goldwater Scholar (2025; 441 selected nationally from 5,000+ applicants)

Stamps Scholar (2024; 365 selected nationally from 500,000+ applicants)

Robert Maynard Hutchins Scholar (2024; top 10% GPA, University of Chicago)

University Scholar (2022; \$100k merit scholarship, University of Chicago)

Provost Scholar (2022; research scholarship, University of Chicago)

LEADERSHIP AND ACTIVITIES

UChicago Robotics

Oct 2022-May 2024

VP of EE; Team Lead, Autonomous Robotics

- Designed and taught 12-week 90-minute introduction to robotics class to 15 Chicago Public Schools students
- Designed PCBs and sensor-fusion algorithms for autonomous navigation
- Led autonomous robotics team at the 2024 UCLA All-American Micromouse Competition

SKILLS

- **Programming:** Python, C, MATLAB, JAX, Git, Linux, HPC
- **Machine Learning:** Bayesian ML, diffusion models
- **Quantum:** Computational quantum optics, quantum simulation, quantum information theory
- **Engineering Tools:** Fusion360, KLayout, GDSFactory, KiCad, manual machining, basic electronics, microcontrollers

ADDITIONAL INFORMATION

- US Citizen