

## Xingjian “Nicholas” Lyu

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### Education

#### Harvard University

Cambridge, MA

A.B. Degree in Physics. GPA: 3.89/4.0. Expected May 2025

Selected coursework: Quantum Computation and Information, Computational Learning Theory, Theoretical Computer Science, Information Theory, Systems Programming, Compilers, General Relativity.

### Undergraduate Research

#### Harvard University

Undergraduate Researcher

Oct 2023–Nov 2024

- Advisor: Kaifeng Bu. Both works undergoing review for publication.
- “[Fermionic Gaussian Testing and Non-Gaussian Measures via Convolution](#)”, first author (Oct 8).
- “[Displaced Fermionic Gaussian States and their Classical Simulation](#)”, first author (Nov 27).

#### Semeghini Lab in Applied Physics

Undergraduate researcher

April 2022 – Oct 2024

- Spearheaded the design and implementation of a [control system](#) for cutting-edge quantum computing systems, currently operational in Harvard’s Yb-Rb and Atom Array II groups.
- Designed an acousto-optic modulator (AOM) double-pass system, using Toptica 399nm laser to empower 2D and 3D magneto-optical traps and Zeeman slowing for ytterbium atoms.
- Designed a micron-resolution length measurement apparatus using interference from a 1064nm laser, used to probe the critical optical path for precise control of atoms.
- Utilized COMSOL Multiphysics to simulate the compensation ability of electrodes, informing the final design to best minimize the Stark shift of atoms.

### Extracurricular Activities

#### Mathematical Picture Language Seminar

Cambridge, United States

Volunteer

Sep 2023–Present

- Help organize [weekly seminars](#) and manage [YouTube channel](#) showcasing talks by renowned physicists and mathematicians like Michael Freedman, Seth Lloyd, and Steven Girvin.

#### Harvard University

Cambridge, United States

Teaching Assistant for *Physics 151: Mechanics*

Sep 2024–Present

- Host weekly office hours and foster community through organizing course dinners.

#### Kaggle

Cambridge, United States

[Competitions Master](#)

2019–2022

- Competition Master status, representing the top percentile of 200k participants in global machine learning challenges.

### Technical Skills

**Computational Libraries:** COMSOL Multiphysics, National Instruments Library, PyTorch, JAX

**Programming Languages:** C++, OCaml, Rust, Python