

Joshua Lin

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EDUCATION

Princeton University, A.B. Mathematics

(Expected) Aug 2023 - May 2027

Minors in Computer Science, Statistics & Machine Learning

GPA: 3.8/4.0

- Relevant Coursework: Linear & Nonlinear Optimization[†], Machine Learning Theory[†], Functional Analysis[†], Complex Analysis, Numerical Analysis, Measure-Theoretic Probability Theory, Algorithmic Game Theory, Theory of Algorithms.
- Awards & Activities: Princeton Physics Pyka Memorial Prize for “promise in independent research,” ACM Competition Chair, Tournaments Officer for Princeton Quantitative Traders, Tour Director for the Princeton Debate Panel.

[†] Denotes graduate coursework.

EXPERIENCE

Statistical Astrophysics Researcher

May 2025 - Aug 2025

Princeton Astrophysical Data Laboratory

Princeton, NJ

- Developing message-passing neural network in PyTorch-Geometric using individual properties of over $\mathcal{O}(10^5)$ galaxies and optical fibers to optimize interactions. Current model attains 98.1% performance of a constraint-free upper bound.
- Designed heterogeneous bipartite graph to model a class of high-dimensional combinatorial optimizations with $\mathcal{O}(10^{10})$ binary variables, constructing a noisy family of smooth functions to discretize the output. [See [blog post](#).]
- My work will help direct the *Prime Focus Spectrograph*’s nightly second-year exposures. The PFS is an international consortium of twenty-seven universities and institutes studying galaxy evolution. [See overview [paper](#).]

Mathematics Teaching Assistant

Jun 2024 - Aug 2024

Jane Street Capital

New York, NY

- Taught topics in probability, combinatorics, and number theory at the Academy of Mathematics and Programming.
- Facilitated probability games, market-making simulations, and the Electronic Trading Challenge.

Computational Physics Researcher

Jan 2023 - May 2023

NASA Jet Propulsion Laboratory

Pasadena, CA

- Developed numerical methods to approximate the ages of lithospheric bands and identify regions of geologic co-/re-activation in Europa’s nondeformed and chaos terrains using NASA’s geographical information system (GIS) databases.
- Fundamentally characterized unmapped regions on Europa by applying modern physical models to *Galileo* data.
- Presented at NASA-JPL summer research conference to physicists on the *Europa Clipper* science team.

PROJECTS

Emergency Signaling System

Nov 2023

Top Prize, HackPrinceton

Princeton, NJ

- Developed “Moco” to discretely execute preset emergency calls, texts, and other customizable actions, triggered by customizable wrist gestures pre-calibrated with iOS app.
- Implemented gesture matching between live Apple Watch accelerometer/gyroscopic data and calibrations using iterative closest point for spatial transformations and dynamic time warping for temporal mappings.

Automated Securities Trader

July 2023

Top Prize, Jane Street Electronic Trading Challenge

New York, NY

- Engineered algorithms to systematically trade bonds, stocks, & ETFs against contestants in live six-hour competition.
- Achieved 1st place in both divisions: a) highest overall PNL, b) greatest peak (last-hour) PNL.

SKILLS, INTERESTS, & AWARDS

Skills Languages: C, C++, Python. Libraries: PyTorch/PyG, CVXPY, Tensorflow, Pandas, Scipy.

Interests High-dimensional probability, statistical learning theory, and stochastic optimization.

Awards Gates Scholarship, USAPhO Semifinalist (Honorable Mention), Wells Fargo Wealth Mgmt Comp 1st Prize.