

# Nathaniel Chen

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## Education

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Princeton University Mechanical & Aerospace Engineering Ph.D. Candidate	Princeton, NJ March 2025 – Present
Princeton University Mechanical & Aerospace Engineering M.A.	Princeton, NJ June 2023 – March 2025
University of California, Los Angeles Physics B.S. & Cognitive Science B.S. w/ Specialization in Computation	Los Angeles, CA Aug. 2019 – June 2023

## Research Experience

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Graduate Researcher Princeton MAE / PPPL	July 2023 – Present Egemen Kolemen
<ul style="list-style-type: none"><li>Led first-of-kind real-time ML emission front control experiment at DIII-D National Fusion Facility</li><li>Developing foundation models for tokamak plasma data</li><li>Built TokEye, a fast signal extraction pipeline for fluctuating tokamak time series</li></ul>	
Cognitive Machine Learning Research Assistant UCLA Psychology	January 2023 – June 2023 Hongjing Lu
<ul style="list-style-type: none"><li>Developed reinforcement learning models for visual perception tasks</li></ul>	
Nuclear Physics Research Assistant UCLA Physics and Astronomy	August 2022 – June 2023 Huan Huang
<ul style="list-style-type: none"><li>Contributed to Glauber model verification analyses for heavy-ion collisions</li></ul>	
Plasma Modeling Summer Intern Princeton Plasma Physics Laboratory	June 2022 – August 2022 Mario Podesta
<ul style="list-style-type: none"><li>Improved simulation speed of ORBIT-GPU by 20x on CUDA</li></ul>	
Biophysics Research Assistant UCLA Physics and Psychology	October 2019 – February 2022 Katsushi Arisaka
<ul style="list-style-type: none"><li>Investigated 3D visual perception of space and shape; co-authored bioRxiv preprint (2022)</li></ul>	
Engram Independent Researcher UCLA Chemistry	January 2020 – March 2020 Paul Weiss
Bioengineering Research Assistant UCSD Bioengineering	June 2017 – February 2019 Milan Makale

## Papers & Presentations

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Towards Large-Scale Heterogeneous Data Organization for Scientific Foundation Models ICLR 2026 Workshop DATA-FM	April 2026
TokEye: Fast Signal Extraction for Fluctuating Time Series arXiv	February 2026
Beyond the Loss Curve: Scaling Laws, Active Learning arXiv	February 2026
Regulation Compliant AI for Fusion Nuclear Fusion	February 2026
Self-Supervised Identification of Coherent Modes in Tokamaks 67th Annual Meeting of the APS Division of Plasma Physics	November 2025
Towards a Foundation Model for Fusion 67th Annual Meeting of the APS Division of Plasma Physics	November 2025
Compact Experimental Negative TriAngUlaritY Reactor (CENTAUR) 67th Annual Meeting of the APS Division of Plasma Physics	November 2025
Real-Time Machine-Learning Enabled Emission Front Control at DIII-D 66th Annual Meeting of the APS Division of Plasma Physics	November 2024
Investigating Guiding Center Versus Full Orbit Effects with ORBIT-GPU 64th Annual Meeting of the APS Division of Plasma Physics	October 2022
Visual Perception of 3D Space and Shape in Time bioRxiv	March 2022

## Skills & Certifications

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Programming: Python, PyTorch, MATLAB, C/C++ (CUDA), Bash, Mathematica  
Software & Tools: LaTeX, OpenBCI, Microsoft Office Suite, Blender, Photoshop, CAD (SolidWorks, Fusion 360)  
Languages: English, Mandarin, Japanese

## Work Experience

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Undergraduate Research Mentor  
Princeton Plasma Control Group  
September 2025 – Present  
Princeton, NJ

Teaching Assistant  
Princeton University  
January – December 2025  
Princeton, NJ

- Fall 2025: MAE 305 - Mathematics in Engineering I
- Spring 2025: SML 301 - Data Intelligence: Modern Data Science Methods

Summer High School Tutor  
Self-Employed  
May 2024 – August 2025  
Princeton, NJ

- Mentored 12+ students across three summers
- Student placed into UPenn, Columbia, UChicago, UCLA, SSP, etc.

Freelance Website Development  
Self-Employed  
January 2024 – May 2025  
Princeton, NJ

## Honors and Awards

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Princeton Artificial Intelligence Lab Graduate Student Fellows 2026  
UCLA College of Letters and Sciences Dean's List 2021  
UCLA College of Letters and Sciences Honors Scholars Program 2019

## Other Contributions

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1000 Layer Networks for Self-Supervised RL, NeurIPS 2025 (Best Paper Award) November 2025  
Princeton University  
Princeton, NJ

- Acknowledgment: Contributed debugging of experiments and high performance compute infrastructure

## Leadership and General Experience

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Coffee Ministry  
Redeemer Presbyterian Church  
March 2026 – Present  
Encinitas, CA

Cookshift & Cleaning  
Scully Food Co-Op  
January 2025 – February 2026  
Princeton, NJ

General Officer  
Princeton Anime-Manga Club  
January 2025 – January 2026  
Princeton, NJ

Social Chair  
Princeton Taekwondo  
January 2024 – December 2024  
Princeton, NJ

Founder & President  
American Nuclear Society at UCLA  
August 2022 – June 2023  
Los Angeles, CA

- Founded UCLA chapter; grew to 50+ active members

Internal Coordinator & NeurotechX Competition Member  
CruX @ UCLA  
October 2021 – June 2023  
Los Angeles, CA

- Founded the 2023 California NeurotechX Conference with 400+ attendees nationally
- 2022 8-member NTX Competition: 3rd place internationally + Best ERP Category

Research Coordinator  
UCLA Psi Chi  
October 2021 – June 2023  
Los Angeles, CA

- Coordinated 80+ member literature review / speaker events
- Developed successful year-long research program for 40+ undergraduate students

Review Board Member  
UCLA Undergraduate Science Journal  
November 2021 – June 2023  
Los Angeles, CA

- Contributed article about National Ignition Facility to 2021 journal

Tuba & Trombone  
Bruin Marching Band and Game Music Ensemble  
August 2019 – June 2023  
Los Angeles, CA