

Qiyu Chen

📍 Beijing, China ✉ cgy@stu.pku.edu.cn ☎ +86 18001312218 🌐 classicalqy.github.io 📺 Classicalqy

Education

School of Physics, Peking University

Sept 2023 – Present

- **Overall GPA:** 90/100
- **Selected Coursework:** Introduction to Computation (Python), Linear Algebra, Advanced Mathematics, Methods of Mathematical Physics, Classical Mechanics, Statistical Physics, Foundations of Neural Modeling, Machine Learning.

Chengdu No.7 High School

Sept 2021 – June 2023

Research Interests

- Computational and theoretical neuroscience; dynamical systems approaches to neural and artificial intelligence.
- Dynamical foundations of learning, representation, and cognition in neural models.
- Brain-inspired computation and neuromorphic computing.

Research Experience

Compute-In-Memory Implementation of Energy-Shaped Continuous-Time SSM Blocks for Physical Transient Sequence Processing

Jun 2026 - Present

The University of Hong Kong with Prof. [Can Li](#) [🔗](#)

- Investigate continuous-time state space models (SSMs) as physically implementable dynamical systems for temporal computation.
- Develop energy-shaped SSM blocks that connect sequence modeling, circuit dynamics, and neuromorphic compute-in-memory implementation.
- Explore how physical transient dynamics can serve as a computational substrate for brain-inspired temporal sequence processing.

Aligning Inductive Bias for Data-Efficient Generalization in State Space Models [🔗](#)

Nov 2024 - Jun 2026

Peking University with Prof. [Guozhang Chen](#) [🔗](#)

- Independently carried out the theoretical derivations, algorithm design, and experiments as the first author.
- Developed a spectral perspective on how state space models impose inductive biases over temporal signals.
- Established a connection between SSM frequency response, kernel eigenstructure, and finite-sample generalization, and proposed task-dependent initialization for data-efficient sequence learning.

Explainability of Hierarchical Reasoning Models

Feb 2026 - Apr 2026

Peking University with Prof. [Guozhang Chen](#) [🔗](#)

- Developed a DMDc-based framework to analyze the internal dynamics of Hierarchical Reasoning Models.
- Studied the energy landscape and dynamical structure underlying hierarchical reasoning behavior.

CUPT Competition [🔗](#)

Oct 2023 - Mar 2024

Peking University

- Investigated nonlinear physical phenomena including wet scroll dynamics, the ruler trick, and quantum light dimmer.
- Built experience in mathematical modeling, physical intuition, and experiment-driven problem solving.
- Awarded the Encouragement Prize in the CUPT.

Publications

Wang, G., Liu, C., Jin, L., Sun, Y., Chen, X., Huang, M., Yuan, M., **Chen, Q.**, Yadkori, Y., Chen, G., & Song, S. (2026). Brain-inspired dual-timescale processing unlocks deep search in neural networks. *Under review*.

Chen, Q., & Chen, G. (2025). Aligning Inductive Bias for Data-Efficient Generalization in State Space Models. arXiv preprint [arXiv:2509.20789](https://arxiv.org/abs/2509.20789) [🔗](#).

Academic Engagement

Summer Research Programme 2026 (participant) *Jun 2026 - Aug 2026*
The University of Hong Kong, Hong Kong SAR, China

The 3rd International Symposium on Cognitive Neuroscience and Intelligent Application (attendee) *Oct 2025*
Hangzhou Dianzi University, Hangzhou, China

Workshop on Physics of Learning (attendee) *Nov 2024*
Institute of Theoretical Physics, Chinese Academy of Sciences (ITP), Beijing, China

Honors and Awards

Merit Student *2024*

Scholarship of China Merchants Securities Co. *2024*

Excellence Plan, School of Physics, Peking University *2023*

The First Prize of the 39th CPhO (Second Round) *2022*

Skills

Languages: Mandarin (native), English (TOEFL 111)

Programming: Python, Mathematica, PyTorch, LTSpice

Technologies: InDesign, Photoshop, Microsoft Office

Extracurricular Activities

“Challenge Cup” Competition of Students’ Extracurricular Academic and Scientific Achievements *Nov 2025 - Mar 2026*
Peking University

- Organized and edited text materials for *Trans-Temporal Interpretation and Visualization of the Zhuangzi* [🔗](#), focusing on “Xiaoyaoyou”, “Yangshengzhu”, and “Renjianshi”.
- Provided technical support by building the project website and processing data for sentence-level segmentation, commentary comparison, and concept visualization.
- Helped develop a digital humanities platform that integrates original passages, annotations, cross-sentence interpretations, evaluative relations, and key philosophical concepts.

Student assistant *Feb 2025 - Present*
Student Career Center, Peking University