Peter Cha

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Education

Cornell University — Ithaca, NY
Ph.D. in Physics — *Sep 2016 – Aug 2022*

University of Waterloo — Waterloo, ON, Canada
M.Sc. in Physics — *Aug 2015 – Jun 2016*

Harvard University — Cambridge, MA
A.B. in Physics with honors, minor in Computer Science — *Aug 2010 – May 2014*

Teaching Experience

Adrian College — Adrian, MI
Assistant Professor of Physics — *Aug 2023 – Present*

- Courses taught: Introductory Physics I & II, Introductory Physics Laboratory, Electronics and Instrumentation, Quantum Physics, Thermal Physics, 20th Century Physics
- College service: College Environment Committee, Higher Learning Commission Comprehensive Review Committee, member of the 2025-2026 Faculty Executive Board as Chair of the Ad Hoc Committee for Faculty Recognition and Social Event Planning
- Established the Physics Student Center (PSC) and hired PSC Assistants to offer drop-in tutoring for students enrolled in physics courses
- Collaborated with colleague on creating Computational Physics and Mathematical Physics tracks for the Bachelor of Science in Physics degree
- Applied for and obtained a grant for a 3D printer for use by students in the physics department
- Faculty advisor for the Adrian College Physics & Astronomy Club

Cornell College — Mt Vernon, IA
Lecturer — *Apr 2023 – May 2023*

- Physics 265: Modern Physics. One semester-equivalent course on the block plan covering quantum mechanics, atomic and nuclear physics, and statistical mechanics.
- Taught a 2-week calculus-based course covering kinematics, Newton's laws, and energy at Beihua University, Jilin, China as part of the Joint Program in Communication Engineering between Beihua University and Cornell College

Cornell University — Ithaca, NY
Teaching Assistant — *Sep 2016 – May 2018*

- Physics 1204: Physics of Musical Sound
- Physics 2207: Fundamentals of Physics I (2 semesters)
- Physics 2214: Oscillations, Waves, and Quantm Physics

Harvard University — Cambridge, MA
Teaching Fellow — *Sep 2014 – Dec 2014*

- Principles of Physics: Electromagnetism, Circuits, Waves, Optics, and Imaging

Research Experience

Adrian College — Adrian, MI
Assistant Professor of Physics — *Aug 2023 – Present*

- Investigated the spectro-temporal receptive field of the auditory cortex, modeled as an all-to-all connected integrate-and-fire neuronal network with synaptic input from cochlear neurons, subject to a varying ratio of excitatory and inhibitory synapses, and presented related poster at the Society for Neuroscience 2024 conference
- Constructed a quantum computing simulator and benchmarked Grover's algorithm in simulation and in IBM Quantum
- Supervised development of a 3D visualization web app for binary star systems and presented at the 2025 Adrian College Ribbons of Excellence conference

Cornell University Ithaca, NY

Postdoctoral Researcher *Nov 2022 – Jun 2023*

- Established a mechanism for linear-in-temperature resistivity at fractional fillings at low-temperatures within the Topological Heavy Fermion description of magic-angle twisted bilayer graphene

Cornell University Ithaca, NY

Graduate Research Assistant *Jun 2018 – Aug 2022*

- Worked in the research group of Eun-Ah Kim on projects in theoretical condensed matter physics, specifically relating to strange metallicity in strongly correlated systems and characterization of quantum computers
- Proposed a classical description of the strange metal state in magic-angle twisted bilayer graphene
- Developed a new method of quantum state tomography based on the Transformer neural-network and analyzed data from IBM Quantum
- Discovered strange metallicity from Planckian dissipation in the quantum critical regime of a microscopic model of spin-1/2 fermions

Perimeter Institute Waterloo, ON, Canada

Perimeter Scholar *Aug 2015 – Jun 2016*

- Worked in the group of Freddy Cachazo on the Cachazo-He-Yuan formalism for scattering amplitudes
- Found new scattering structures hidden in the soft limit of scattering amplitudes

Relevant Experience

Sciencenter Ithaca, NY

Volunteer *Sep 2021 – Jul 2022*

- Facilitated public engagement with hands-on experiments in the Discovery Space and interactions with resident reptiles and animals in the saltwater tidepool Touch Tank

Cornell University Ithaca, NY

Pre-College Opportunity Program Tutor *Sep 2017 – May 2018*

- Tutored middle and high school students in one-on-one and small-group settings through the Cornell Science and Technology Entry Program
- Supported high school students with their college applications as part of Upward Bound, a federal college preparatory program for students with qualifying needs

Honors & Awards

Colman Inclusive Leadership Program Ithaca, NY

Selected participant *Jun 2022*

- Leadership development program introducing graduate students at Cornell and other universities to concepts and practical skills pertaining to inclusive leadership, including emotional intelligence and conflict resolution

Graduate fellowship Ithaca, NY

Recipient *February 2015*

- 1-year research fellowship awarded to incoming Cornell graduate students

Selected Conference Experience

2024

- "Spectro-Temporal Receptive Field of In-Silico Neural Networks with Excitation-Inhibition Imbalance", Society for Neuroscience 2024

2022

- "Machine-learning Augmented Shadow Tomography", American Physical Society March Meeting

2021

- "Attention-based State Characterization", Association of Korean Physicists in America and Korean Physical Society Joint Symposium. Invited talk.

2019

- "T-linear resistivity in models with local self-energy", American Physical Society March Meeting

Skills

Data science: Python, Mathematica, GitHub, MATLAB, Excel

Research topics: Strongly correlated electrons, quantum information, quantum computing, machine-learning

Languages: Korean (Native), English (Fluent)

Other: Taekwondo, classical violin