Kaiming Liu

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EDUCATION

Sept 2017 – Jul 2023 (expected)	**Xi'an Jiaotong University** (XJTU)	Xi'an, P.R.China
Sept 2017 – Jul 2019	*Pre-university education*
	Honors Youth Program, School of Gifted Young
Sept 2019 – Jul 2023 (expected)	*Bachelor of Science in Physics*
	Honors Science Program (Physics), School of Physics
	GPA: 3.89 / 4.3 (3.77 / 4.0)	In-major GPA: 3.93 / 4.3 (3.80 / 4.0)
	Average score: 90.46 / 100	Ranking: 2nd/200 (School of Physics)
	Core Courses:
	Optics (95/100) Contemporary Physics Experiment (98/100)
	Calculus-2 (95/100) Methods of Mathematical Physics (91/100)
	Atomic Physics (97/100) Basic Physical Experiment (98/100)
	Thermal Physics (98/100) Probability Theory (96/100)
Aug 2021 – Dec 2021	**The University of California, Berkeley** (UCB)	CA, US
Exchange Student of BPIE program	GPA: 4.0 / 4.0	Grade Level: A
	Core Courses:
	Quantum Mechanics (A+)
	Introduction to Statistical and Thermal Physics (A)
	Introduction to Computational Techniques in Physics (A)

SCHOLARSHIP & AWARDS

2019 China Undergraduate Physics Tournament Northwest Division (*The First Prize*)

2019 China Undergraduate Physics Tournament Finals (*Grand Price, Top four teams of China*)

2020 Mathematical Contest in Modeling in China, Shannxi Division (*The First Prize, 1% of 500 teams*)

2020 Xi'an Jiaotong Academic Scholarship (*Awarded to undergraduates with great performance in research*)

2021 Mathematical Contest in Modeling (*Meritorious Winner, Top 7% of 20,000 teams worldwide*)

2020, 2021 Everest Scholarship, Xi'an Jiaotong University (*Highest Honor in the School of Physics, top 1%*)

2021 National Scholarship (*Highest scholarship awarded by the Chinese government, **Top 20 students out of 16000 undergraduates***)

PUBLICATIONS & MANUSCRIPTS

1 **Kaiming Liu**, Yajie Zhou, Shumin Zhao, Hongli Wang. Fluid suspension and its stability[J]. *Physics Experimentation*, 2021, 41(03): 46-53+58. DOI:10.19655/j.cnki.1005-4642.2021.03.010.

2 Peter H. Jacobse, Michael C. Daugherty, Kristiāns Čerņevičs, Ziyi Wang, Ryan D. McCurdy, Reis Dorit, **Kaiming Liu**, Jiaming Lu, Oleg V. Yazyev, Felix R. Fischer, Michael F. Crommie. Decoupling localized modes in nanographenes. Manuscript in preparation.

RESEARCH EXPERIENCE

Aug 2018 – Aug 2019	**Xi'an Jiaotong University**	Xi'an, P.R.China
	Contestant of the China Undergraduate Physics Tournament
	Advisor: Prof. Shumin Zhao & Prof. Hongli Wang

Project 1: Fluid Suspension and its stability

Description: A light cylinder will start to spin while being suspended near the edge of a water jet.

- I used the Navier-Stokes equation and boundary layer theory to build a theoretical model and proved that this effect is caused by the pressure difference.
- Working with another undergraduate student, I completed a numerical simulation of this model to solve for the velocity field around the suspended cylinder.
- I designed and built the experimental device independently, successfully suspended cylinders and spheres of different sizes, and measured their stability.

Oct 2021 – Dec 2021   **The University of California, Berkeley** | CA, U.S
Research Assistant of Prof. Crommie's Group
Advisor: Prof. Michael F. Crommie, Department of Physics

Project 1: "Daisy Chain" on Au(111) surface

Description: Studied the behavior of the magnetic ground state of dibenzoquateranthene (DBQA) on a gold surface with scanning tunneling microscopy (STM).

- I learned to use Matrix-Assisted Direct (MAD) Transfer and Bottom-Up Approach to achieve an on-surface synthesis of poly-DBQA from precursor iodophenyl-bromobianthryl (PBA).
- I mastered many experimental skills of Scanning Probe Measurements, such as annealing, sputtering, transferring samples, and refilling liquid Helium and Liquid Nitrogen. etc.
- I learned to use software to control STM to get topographic images of poly-DBQA chains. ("Daisy Chain")

Project 2: Five-fold structure on Au(111) surface

Description: Proposed a method for synthesizing five-fold structures on a gold surface.

- I used the Bottom-Up approach to synthesize five-fold structures from five-membered ring molecules.
- I collaborated with my colleagues to get topographic images of five-point star structures by STM.

Project 3: Single strands of deoxyribonucleic acid (DNA) on Au(111) surface

Description: Studied the behavior and structure of single strands of DNA on a gold surface with STM.

- After the training on the first two projects, I mastered a lot of experimental skills. Therefore, in this project, I finished MAD Transfer independently to achieve the on-surface synthesis of single strands of DNA.
- I collaborated with my colleagues to get topographic images of single strands of DNA by STM.

Mar 2022 – Now   **Xi'an Jiaotong University** | Xi'an, P.R.China
Research Assistant of Quantum Many-body Physics and Quantum Information in Cold Atoms Group
Advisors: Prof. Yongchang Zhang, School of Physics

Project 1: Rydberg atomic system and quantum nonlinear optics

Description Couple Rydberg atoms and photons to create interactions between coupled systems. Therefore, we can use this property to realize the function of a qubit gate.

- I reproduced the derivation of the Hamiltonian matrix of the Rydberg atomic system. Additionally, I developed a deeper understanding of the physical nature behind the Rydberg atoms.
- My colleagues and I designed and co-proposed the realization of qubit gates through the interaction of Rydberg atomic systems coupled with photons.
- I used MATLAB to conduct numerical simulations of the Rydberg atomic system, such as the energy distance relationship and time evolution of dark-state polariton. I developed a better understanding of photon-mediated atomic interactions from numerical simulation.

LANGUAGE SKILLS

TOEFL iBT   108/120 (Reading 28, Listening 26, Speaking 25, Writing 29)