

CHEN HUANG

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EDUCATION

- **Imperial College London** London, UK
M.Sc. in Physics with Extended Research, advised by Dr. John Michniewicz Sep. 2023 – Sep. 2025 (Expected)
- **Huazhong University of Science and Technology (HUST)** Wuhan, CN
B.S. in Physics, advised by Prof. Jianming Cai GPA: 89.5/100 (top 5%) Sep. 2018 – Jun. 2022

RESEARCH EXPERIENCE

- **Quantum Optics and Laser Science (QOLS) Group, Imperial College London** London, UK
M.Sc. Student, advised by Dr. John Michniewicz Jun. 2024 – Present
Charge Noise in Semiconductor Spin Qubits for Quantum Computing
 - Performed wire bonding to connect quantum devices to holders for characterization.
 - Characterized charge transport properties of semiconductor quantum dots at cryogenic temperatures in dilution refrigerators.
 - Developed an automated Python package standardizing communication protocols across diverse experimental devices.
- **Quantum Operating System Group, Beijing Academy of Quantum Information Sciences (BAQIS)** Beijing, CN
Research Intern (remote), advised by Dr. Jingbo Wang May 2024 – Present
Rydberg Quantum Computing and Compilation
 - Developed a novel zoned architecture for neutral atom quantum platforms, partitioning computational zones into storage and entanglement regions to maximize scalability and parallelism.
 - Designed and implemented a Python-based compilation tool, leveraging ASAP scheduling and simulated annealing algorithms to optimize qubit placement and routing for neutral atom quantum computing.
 - Demonstrated a 5.4x enhancement in quantum circuit fidelity for 100-qubit systems relative to the state-of-the-art platform.
- **Institute for Quantum Computing, Baidu, Inc.** Beijing, CN
Research Intern, advised by Dr. Jingbo Wang Mar. 2023 – Sep. 2023
Automated Calibration of Experimental Parameters in Trapped-Ion Quantum Computer
 - Designed and implemented a calibration framework for trapped-ion systems, enabling precise determination of phonon frequencies (ω_k) and Lamb-Dicke parameters (η_{jk}).
 - Developed a Python-based automated calibration tool, significantly reducing manual intervention and improving parameter accuracy.
 - Contributed to three patents enhancing calibration methods for trapped-ion quantum computing.
- **International Joint Lab on Quantum Sensing and Quantum Metrology, HUST** Wuhan, CN
Research Assistant, advised by Prof. Jianming Cai Apr. 2019 – Dec. 2022
Nanoscale Detection of Ions Using a Spin Quantum Sensor
 - Derived analytical solutions for electrostatic potential and ion distribution using the Poisson-Nernst-Planck (PNP) equation in MATLAB and Mathematica.
 - Applied spin-echo techniques to measure decoherence times of NV centers for nanoscale electron spin sensing in solution.
 - Examined ion dynamics under AC voltage in a simplified 1D surface forces apparatus model, establishing correlations between AC voltage and NV-based sensing.
Measurements of Entangled Qubits
 - Conducted experiments with photon polarization-entangled qubits using SPDC in nonlinear BBO crystals; achieved high concurrence (0.825) verified through quantum state tomography.
 - Reconstructed density matrices of entangled photon pairs, demonstrating Bell inequality violation.
 - Used QuTiP to calculate entanglement measures and visualize quantum states.

PUBLICATIONS

- **C. Huang**, X. Zhao, H. Xu, W. Zhuang, M.-J. Hu, D. E. Liu, and J. Wang, “ZAP: Zoned Architecture and Parallelizable Compiler for Field Programmable Atom Array,” *arXiv preprint arXiv:2411.14037*, 2024.

PATENTS

- J. Wang and **C. Huang**, “Ion trap chip parameter determining method and device, electronic equipment and medium,” *Chinese Patent CN117371547*, Granted 2023.
- **C. Huang** and J. Wang, “Ion trap chip parameter correction method and device, electronic equipment and medium,” *Chinese Patent CN117454997*, 2023.
- J. Wang and **C. Huang**, “Ion trap chip parameter calibration method and device, electronic equipment and medium,” *Chinese Patent CN117494829*, 2023.

SKILLS

- **Experimental:** Wire Bonding, Dilution Refrigerator, Scanning Tunneling Microscope (STM), Raman Spectrometer
- **Programming and Software:** Python (advanced development, package creation, scientific computing), MATLAB, \LaTeX , AutoCAD, Mathematica

AWARDS AND HONORS

- **Outstanding Intern**, Baidu, Inc., 2023
- **Outstanding Graduate**, HUST, 2022
- **UCAS Scholarship**, University of Chinese Academy of Sciences, 2020
- **Yan Ji-ci Scholarship**, Institute of Physics, Chinese Academy of Sciences, 2020
- **Outstanding Undergraduate in terms of Academic Performance**, HUST, 2019 (*Highest honor for undergraduates at HUST, top 1%*)
- **National Scholarship**, Ministry of Education of China, 2019 (*Highest honor for university students in China, awarded to top 0.2% nationwide*)

LEADERSHIP

- **Innovative Base of Physics Experiments (IBPE), HUST**

Chairperson

Wuhan, CN

May 2019 – Jul. 2020

- Led a team of over 50 members, overseeing the research and academic activities of IBPE and fostering a collaborative learning environment within the physics department.
- Mentored freshperson on foundational physics concepts from *The Feynman Lectures on Physics* and supervised their IYPT research, guiding them in theoretical analysis, experimental design, and simulation practices.
- Chaired IBPE's annual academic meetings and organized seminars on advanced topics such as *Advanced Algebra*, *Quantum Mechanics*, and *Quantum Computing*.