

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 – Jun. 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**
Graduate Researcher, advised by Dr. John Michniewicz *Jun. 2024 – Present*
Charge Noise in Semiconductor Spin Qubits for Quantum Computing
 - Conducted wire bonding to connect quantum devices to chip holders for characterization purposes.
 - Characterized charge transport properties of semiconductor quantum dots under cryogenic conditions using 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*
Compilation for Neutral Atom Quantum Computers
 - Designed a novel zoned architecture for neutral atom quantum platforms, dividing computational zones into storage and entanglement regions to enhance scalability and enable parallelism.
 - Developed a Python-based compilation tool utilizing ASAP scheduling and simulated annealing algorithms to optimize qubit placement and routing in neutral atom quantum computing.
 - Achieved a 5.4x improvement in quantum circuit fidelity for 100-qubit systems compared 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 measurement 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 systems.
- **International Joint Lab on Quantum Sensing and Quantum Metrology, HUST** **Wuhan, CN**
Undergraduate Researcher, 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 by solving the Poisson-Nernst-Planck (PNP) equation using MATLAB and Mathematica.
 - Developed a 2D axisymmetric model of a Surface Forces Apparatus cavity and conducted finite element analysis in COMSOL.
 - 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 generated via SPDC in nonlinear BBO crystals, achieving high concurrence (0.825) verified through quantum state tomography.
 - Reconstructed density matrices of entangled photon pairs, demonstrating Bell inequality violation.
 - Utilized QuTiP to compute 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.
- J. Wang and **C. Huang**, “Ion trap chip parameter calibration method and device, electronic equipment and medium,” *Chinese Patent CN117494829*, Granted 2023.
- **C. Huang** and J. Wang, “Ion trap chip parameter correction method and device, electronic equipment and medium,” *Chinese Patent CN117454997*, 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 Term of Academic Performance**, HUST, 2019 (*The greatest honor for undergraduates at HUST, top 1%*)
- **National Scholarship**, Ministry of Education of China, 2019 (*The 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

- Chaired IBPE's annual academic meetings and organized seminars on advanced topics, including *Advanced Algebra*, *Quantum Mechanics*, and *Quantum Computing*.
- Mentored a Feynman reading group for first-year students, assigning weekly tasks from *The Feynman Lectures on Physics*, including theoretical derivations, experimental design, and simulations.
- Founded *IBPE Review Letters* to document and disseminate the intellectual contributions of IBPE members.