CHEN HUANG

chen.huang23@imperial.ac.uk Linkedin chenx820.github.io

EDUCATION

- **Imperial College London** **London, UK**
  M.Sc. in Physics with Extended Research, advised by Dr. John Michniewicz *Sep. 2023 – Jun. 2025 (Expected)*
  - **Relevant Coursework:** Quantum Information, Quantum Optics, Quantum Theory of Matter
- **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 cryogenic characterization.
  - Characterized charge transport in semiconductor quantum dots using dilution refrigerators.
  - Developed a Python package standardizing experimental device communication, improving efficiency.
- **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 Computing
  - Designed a novel zoned architecture for neutral atom quantum platforms, enhancing scalability and enabling parallelism.
  - Developed a Python-based compiler optimizing qubit placement and routing, utilizing ASAP scheduling and simulated annealing.
  - Achieved a 5.4x improvement in quantum circuit fidelity for 100-qubit systems compared to existing implementations.
- **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 a calibration framework for trapped-ion systems, enabling precise measurement of phonon frequencies and Lamb-Dicke parameters.
  - Developed automated Python-based calibration tools, reducing manual intervention and improving parameter accuracy.
  - Contributed to three patents on improved calibration techniques for trapped-ion quantum computing.
- **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 (Final Year Project)
  - Solved the Poisson-Nernst-Planck (PNP) equation using MATLAB to model electrostatic potential and ion distribution.
  - Developed a 2D axisymmetric model of a Surface Forces Apparatus cavity and conducted finite element analysis in COMSOL.
  - Investigated ion dynamics under AC voltage in a simplified 1D SFA model, establishing correlations between AC voltage and NV-based sensing.

  Measurements of Entangled Qubits
  - Conducted experiments on 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.
  - Applied 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*, 2023.
- **C. Huang** and J. Wang, "Ion trap chip parameter correction method and device, electronic equipment and medium," *Chinese Patent CN117454997*, 2023.

Skills

- **Quantum Computing:** Qiskit, QuTiP, Quantum Circuit Compilation (Trapped-Ion & Neutral Atom), Automated Calibration of Experimental Systems
- **Experimental:** Dilution Refrigerators, Wire Bonding, Quantum Device Characterization, Scanning Tunneling Microscope (STM), Raman Spectrometer
- **Programming and Software:** Python (Scientific Computing, Package Development, Automation for Experimental Control), MATLAB, LaTeX, Mathematica

Awards and Honors

- **China National Scholarship**, Ministry of Education of P.R. China, 2019 *(The highest honor for university students in China)*
- **Outstanding Undergraduate in Term of Academic Performance**, HUST, 2019 *(The greatest honor for undergraduates at HUST, top 1%)*
- **Yan Ji-Ci Scholarship**, Institute of Physics, Chinese Academy of Sciences, 2020
- **UCAS Scholarship**, University of Chinese Academy of Sciences, 2020
- **Outstanding Graduate**, HUST, 2022
- **Outstanding Intern**, Institute for Quantum Computing, Baidu, Inc., 2023

Leadership

- **Innovative Base of Physics Experiments (IBPE), HUST** **Wuhan, CN**
  Chairperson *May 2019 – Jul. 2020*
  - Led IBPE's annual academic meetings and organized seminars on advanced topics, including *Advanced Algebra*, *Quantum Mechanics*, and *Quantum Computing*.
  - Mentored first-year student reading groups on *The Feynman Lectures on Physics*, guiding theoretical derivations, experimental design, and computational simulations.
  - Established *IBPE Review Letters* to document and disseminate members' research contributions.