# Chen Huang
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## EDUCATION

**Huazhong University of Science and Technology (HUST)**                           **Wuhan, China**
B.S. in Physics                         GPA: 3.89/4.00 (Top 10%)                       *09/2018 – 06/2022*
**Peking University**                                                                **Beijing, China**
Summer Program: Introduction to Quantum Information Technology, Quantum Mechanics (II)
*06/2020 – 07/2020*

## RESEARCH EXPERIENCE

**International Joint Laboratory on Quantum Sensing and Quantum Metrology**         **Wuhan, China**
*Research Assistant | Supervisor: Prof. Jianming Cai*                              *04/2019 – 12/2022*
**Nanoscale Detection of Ions Using a Spin Quantum Sensor** (Graduation Project)
➢ Investigated the distribution of ions in solution under AC voltage and established the relationship between ion distribution and NV sensing
➢ Calculated the analytical solutions of the electrostatic potential and ion distribution using MATLAB and Python
➢ Designed a 3D model of the surface forces apparatus (SFA) with AutoCAD
**Measurement of Entangled Qubits**
➢ Designed and built the optical parts of the experimental system, including adjusting the half-wave plates and quarter-wave plates to guarantee the polarization state of photons
➢ Prepared the maximally entangled state of the photon pair based on spontaneous parametric down-conversion (SPDC) process
➢ Using the single-photon detector, reconstructed the density matrix of photon polarization entangled qubits and calculated the concurrence of the entangled state of the density matrix, $C = 0.825$
➢ Simulated the dynamics of open quantum systems with the open-source software QuTiP

**Bradley Laboratory (University of Saskatchewan)**                              **Saskatchewan, Canada**
*Research Intern | Supervisor: Prof. Michael Bradley*                             *05/2021 – 09/2021*
**New Plasma Processing Techniques for Advanced Materials** (MITACS Globalink Project)
➢ Explored cutting-edge plasma processing techniques such as Microwave Plasma Chemical Vapor Deposition (MPCVD) and Plasma Ion Implantation (PII)
➢ Modeled the motion of particles in a given electromagnetic field and showcased its significance to PII applications

**Low Dimensional Physics and Interface Engineering Laboratory (SJTU)**            **Shanghai, China**
*Research Intern | Supervisor: Prof. Hao Zheng*                                   *07/2021 – 08/2021*
**STM Study of Topological Insulators**
➢ Fabricated needle tips for STM via the electrochemical method
➢ Acquired knowledge and hands-on experience with molecular beam epitaxy (MBE) and scanning tunnel microscope (STM)
➢ Investigated the setup and principle of the dilution refrigerator and the Raman spectrometer; studied the exotic structural and electronic properties of topological insulators at ultralow temperatures

**HUST Innovative Base of Physics Experiments (IBPE)**                             **Wuhan, China**
*Student Research Team Leader | Supervisor: Assoc. Prof. Ming Yang*               *10/2018 – 08/2019*
**China Undergraduate Physics Tournament (CUPT) Projects**
➢ Completed 17 projects at CUPT (2019) and won national third place in the competition
➢ Developed computer skills in MATLAB, Python, COMSOL, and CAD
**Image Removal Algorithm Based on Fraunhofer Diffraction**
➢ Studied the principles of pattern recognition and deep learning, then write programs to identify the sample features and automatically classify the diffraction images
➢ Designed a set of algorithms to remove the starburst phenomenon in pictures based on the combined effect determined by optical Fraunhofer diffraction and CMOS

## EXTRACURRICULAR ACTIVITIES

**HUST Innovative Base of Physics Experiment (IBPE)**                          **Wuhan, China**
*Student Leader*                                                                *05/2019 – 07/2020*

➢ Organized the academic annual meeting of IBPE and routine seminars, including Advanced Algebra (02/2019 – 06/2019), Quantum Mechanics (12/2019 – 05/2020) and Advanced Quantum Mechanics (09/2020 – 12/2020)
➢ Led freshmen to read "Feynman Physics Lectures" and participate in CUPT research, assigned tasks such as theoretical derivation, experiment design, and computer simulation every week to help them adapt to college physics learning

## AWARDS & HONORS

**HUST Outstanding Graduate**, 2022
**Yan Ji-ci Scholarship**, 2020 | Institute of Physics, Chinese Academy of Sciences (CAS)
**UCAS Undergraduate Scholarship,** 2020 | One of 995 undergraduates across China
**China National Scholarship,** 2019 | Highest honor for undergraduates in China, Top 0.2% among all undergraduates
**Outstanding Undergraduates in Term of Academic Performance,** 2019 | Highest honor for undergraduates at HUST, Top 1% among all sophomores and juniors

## SKILLS

**Technical**: Scanning Tunnel Microscope (STM), Raman Spectrometer, Dilution Refrigerator, Molecular Beam Epitaxy (MBE)
**Computer**: Python, MATLAB, QuTiP, LaTeX, COMSOL, AutoCAD