ZHONGQI XIU

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EDUCATION

University of Science and Technology of China (USTC) *(2021 - Present)*
Major in Optic and Optical Engineering
GPA: 3.73/4.0

HONORS

Chung-Yao Chao Talent Program Scholarship *2023,2024*
Outstanding Student Scholarship, Silver Prize (Top 10%) *2022,2023*
Endeavor Scholarship (Top 5%) *2022*
Outstanding Freshman Scholarship, Third prize *2021*

RESEARCH EXPERIENCE

Single photon emitter creation in few layer 2D materials *2024 - Present*
Supervisor: Prof. Shengxi Huang Mentor:Wenjing Wu SCOPE Lab, Rice University

- Exfoliated WSe_2 and WS_2 thin layers and fabricated heterostructures with hBN and graphene. Transferred heterostructures onto pre-fabricated substrates with strain engineering features (nano pillars, nano discs).
- Performed remote nitrogen plasma treatment on exfoliated WS_2 flakes to create substitution defects.
- Carried out optical spectroscopy measurements, including photoluminescence (PL), Raman, and time-correlated single photon counting (TCSPC) spectroscopy, to comprehensively study the property of single photon emitters.
- Examined the single photon emission quality by conducting photon statistic measurements, obtain second-order correlation function $g^{(2)}(\tau)$ using Hanbury Brown and Twiss (HBT) interferometry.
- Improved the purity of SPE by polarization selection, electrostatic gating, and charge transfer between molecules and graphene.

Single atom trapping based on movable optical lattices *2022 - 2024*
Supervisor: Prof. Chuanfeng Li Mentor: Dr. Jian Wang LQCC Lab, USTC

- Contributed to the optical path building in a magneto-optical trap for ^{87}Rb. Independently built the double pass configuration to adjust the frequency of cooling light with Bragg diffraction.
- Built and tested the second ultrahigh optical accessible vacuum system in the lab, in which an Rb atom dispenser was mounted for the MOT and optical dipole traps for ensembles and single atoms. Reached ultra-high vacuum in the system: 3×10^{-11} Torr.
- Independently pre-treated the optical fibers for vacuum systems and tested the mode field diameter of treated single-mode fiber to optimize the mode matching between the modes of cavity and fiber.
- Carried out control circuits design and installed control electronics, including the microwave amplifier, radio frequency switch, and radio frequency generator, into multiple integrated chassis to facilitate the connection of electrical devices in the optical path.
- Fine-tuned and achieved the control time of atoms to 3s. (Unpublished)

MANUSCRIPT

Wenjing Wu, Alex Strasser, **Zhongqi Xiu**, Hangzheng Shen, Song Liu, Luke Nemetz Holtzman, James C. Hone, Vasiliy Perebeinos, Junichiro Kono, Xiaofeng Qian, and Shengxi Huang. (Submitting)
Facile approach to ultra-high single-photon emission purity in atomically thin semiconductor

Wenjing Wu, Jiangxu Li, **Zhongqi Xiu**, Seng-Huat Lee, Aparna Jayakumar, Zhiqiang Mao, Emilia Morosan, Junichiro Kono, Liangbo Liang, Yang Zhang, and Shengxi Huang. (Writing)
Substrate-Dependent Interlayer Coupling in $MnBi_2Te_4$

TEACHING ASSISTANT

Optics B(Fall 2023) *2023*

- Instructor: Prof. Zheng Xi
- Credit 3; Class: 58 juniors; Course Website: icourse.club/course/22022

KEY COURSES TAKEN

Mathematical Analysis (90)	Function of Complex Variable (94)	Computer Programming (95)
Quantum Mechanics (95)	Advanced Photon Physics* (93)	Optics (90)
Engineering Optics* (94)	Equations of Mathematical Physics (90)	Solid State Physics (90)

(* means graduate course)

OPERATION PROFICIENCY

Optical path construction

· Coupling and design of optical paths, fiber and free space beam and instrument aligning
· Fiber cavity preparation, mode-locking and testing of lasers

Characterization

· Optical spectroscopy (photoluminescence, time-correlated spectroscopy, Raman spectroscopy, reflectance, polarization resolved spectroscopy, HBT interferometry)

Nanofabrication

· Thin film deposition, lithography, dry and wet etching, 2D heterostructure stacking and transferring.

SKILLS

Programming Languages	Python, C/C++, HTML/CSS
Frameworks and Softwares	Anaconda, MATLAB, Solidworks, LabVIEW, Keil, COMSOL
English	TOEFL: 99, GRE: 325+4.0

OTHER PROJECTS

Simulation of the focusing property with high-NA lens of vectorial polarized beam *2024*

· Simulated and analyzed different polarized light Bessel-Gauss beams and polarized light beams with vortex phase at the focal plane based on the Richard-Wolf vector-integral formula.

RoboGame 2023 *2023*

· Coded the main control board (STM32) using Cubemx and Keil.
· Wrote and fine-tuned the PID algorithm for wheel movement.

Search exotic particles with deep learning and classify phases in the Ising Model *2023*

· Described a ferromagnetic phase transition problem using two-dimensional array of atomic dots.
· Utilized deep neuron network to examine the search for supersymmetry in collider experiments.