ZHONGQI XIU

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EDUCATION

University of Science and Technology of China *(2021 - Present)*
Major in Optic and Optical Engineering
GPA: 3.68/4.3 (87/100)

HONORS

Chung-Yao Chao Talent Program Scholarship *2023*
Outstanding Student Scholarship, Silver Prize (Top 10%) *2022,2023*
Endeavor Scholarship (Top 5%) *2022*
First Prize in the electromagnetism course essay competition (IYPT 2022) *2022*
Outstanding Freshman Scholarship, Third prize *2021*

RESEARCH EXPERIENCE

Single photon emitter creation in few layer 2D materials *2024 - Present*
Supervisors: Wenjing Wu and Prof. Shengxi Huang SCOPE Lab

- 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*
Supervisors: Dr. Jian Wang and Prof. Chuanfeng Li CAS Key Lab of Quantum Information

- 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.
- Achieved the control time of atoms to 3s (Unpublished)

PUBLICATION

Wenjing Wu, **Zhongqi Xiu**, Hangzheng Shen, Song Liu, James C. Hone, Junichiro Kono, Shengxi Huang.(Unpublished)
Approaching the intrinsic purity of single photon emitter in atomically thin semiconductor

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
- 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: 100 (R: 26; L: 27; S: 23; W: 24;)

CURRICULAR PROJECTS

Discover physical concepts with machine learning and neural networks *2021 - 2022*

- Independently built neural networks with three neurons using MATLAB.
- Derived the Planck radiation law formula from original spectrum data using the model.

Simulation and review of light field modes in Fabry–Pérot cavity *2022*

- Simulated the optical characteristics (transmission rate, resonance mode...) of Fabry–Pérot resonators using COMSOL and compared the results with analytical solutions.

RoboGame 2023 *2023*

- Designed the main control board (STM32) using Cubemx and Keil
- Drew the power distribution boards PCB, ensured consistency across all robot components.
- Wrote and fine-tuned the PID algorithm for wheel movement.