

# XINAN WU

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## EDUCATION

### Peking University

*Major in Physics*

Sep 2019 - Jul 2023 (Expected)

Grade: 91.1/100 (Major), 89.7/100 (Overall)

#### Advanced Courses:

- Introduction to Nanoscience and Technology | 100/100
- Seminar for Equilibrium Statistical Physics | 100/100
- Seminar for Quantum Mechanics | 98/100
- Advanced Technologies and Experiments for Materials Characterizations | 96/100
- Introduction to Nanoelectronic Devices | 95.5/100
- Ultrafast Laser and Spectroscopy | 95/100
- Nanoionics | 95/100
- Nonlinear Optics | 94/100
- Geometrical Optics and Optical Instruments | 93/100
- Materials Physics | 92/100
- Wide Bandgap Semiconductor | 91.5/100

## RESEARCH EXPERIENCE

### Research on Quasi-2D Blue Perovskite LEDs

Jul 2022 - Dec 2022 (Expected)

*Supervisor: Prof. Letian Dou*

*Purdue University*

- Studied the effect of different ligands on the luminescence properties (such as PLQY and the decay time) of quasi-2D perovskites.
- Fabricated devices and optimized parameters (such as HTL and ETL) to achieve high device efficiency and stability.
- **Progress:** Start writing the manuscript, the first paper is in preparation.

### Undergrad Research in Rice University Virtually

May 2022 - Sep 2022

*Supervisor: Prof. Boris I. Yakobson*

*Rice University*

#### Research on Potential Offset Calculation

May 2022 - Sep 2022

- For the periodic intercalation charges of infinite large planes, used Fourier Transformation to calculate the potential distribution of its 3D space.
- Calculated the potential distribution in 3D space in the situation of inserting a layer of BN in different directions of the diamond analytically, and specifically brought into the numerical calculation and compared with DFT method.
- Used the charge analysis method to give the charges of all atoms in one period and used them to calculate the potential offset after inserting the BN layer.

#### Research on Colors of Different 2D Materials

Jul 2022 - Aug 2022

- Calculated the color distribution of different 2D materials under different layers using TM and DFT methods.
- Analytically explained the color oscillation result by using DFT calculation.

### Undergrad Research in Peking University

Jan 2021 - Jun 2022

*Supervisor: Prof. Yunan Gao*

*Peking University*

#### Improvement on Synthesis of CdSe/CdS Core/Shell Nanoplatelets

Apr 2022 - Jun 2022

- Prepared 3MLs CdSe nanocrystals with CdS/ZnS shell of good quality by hot injection method.
- Optimized the synthesis and characterized the properties (PLQY, the decay time, and the stability) of CdSe/CdS Core/Shell nanoplatelets.

#### Improvement on CsPbI<sub>3</sub> Perovskite Single Quantum Dots Luminescence

Sep 2021 - Apr 2022

- Prepared CsPbI<sub>3</sub> perovskite nanocrystals of good quality (single exponential decay) by hot injection method, and perovskite films by spin coating.
- Characterized the properties (PLQY, the decay time, and the stability) of perovskite single quantum dots at low temperature (4.2K).
- Fabricated single perovskite quantum dots sandwiched by 2D hBN sheets and characterized their luminescence condition at low temperature (4.2K).

#### CsPbBr<sub>3</sub> Perovskite Single-Crystal Films Based Micro-Nano Lasers

Apr 2021 - Dec 2021

- Fabricated perovskite seeds using the inkjet printing method, and prepared single-crystal films with controllable thicknesses.
- Performed ion beam etching of the synthesized films, structural characterization, and measured their fluorescence properties.

## **Yutchun - Weizmann Winter School**

**Jan 2022 - Mar 2022**

*Weizmann Institute of Science, Israel*

*Remote*

- Listened to talks given by professors from Weizmann Institute of Science and raised questions, then discussed them with professors.
- Contacted Prof. Yuval Gefen via email and had meetings to discuss some questions about active quantum steering, and then did literature research on measurement-induced quantum steering.
- Gave a presentation about the research and set up a research proposal, and finally got an “Outstanding” evaluation (Top 35% among over 60 students).

## **SIR Model Based Research on Infectious Disease Transmission**

**Dec 2020 - Apr 2021**

*Supervisor: Prof. Guanxiang Wang*

*Peking University*

- Established the SIR model and conducted numerical simulation on the data immediately after the outbreak of COVID-19 in China to analyze its parameter sensitivity.
- Introduced SEIR model and Time-Delay model to optimize and analyze the model.
- Conducted mean-field modeling of infectious disease transmission and combined with SIR model to analyze and calculate the optimal vaccination strategy.

## **WORK EXPERIENCE**

### **SDS “Question Bar” Program in Peking University**

**Oct 2021 - May 2022**

*Teaching Assistant*

*Peking University*

- Answered questions from students in all basic physics courses such as mechanics, electromagnetism and advanced mathematics.
- **Impact:** Most students got at least an A- grade (over 85/100).

### **Peijian Education Limited Company**

**Jul 2019/2020/2021-Aug 2019/2020/2021**

*Teaching Assistant*

*Hangzhou China*

- Delivered a number of physics lessons at college level to high school students, and gave students some mock exams for the National Physics Olympiad.
- **Impact:** Over 20 students got the first prize in the National Physics Olympiad (top 100 among all Chinese high school students), and 5 of them joined the National training team for IPhO (top 50 among all Chinese high school students).

## **AWARDS & SCHOLARSHIPS**

- Merit student in Peking University (Top 5% among all undergraduate and graduate students in Peking University) 2022
- Qin Wanshun Jin Yunhui Scholarship (Top 2% among all undergraduate and graduate students in Peking University) 2022
- WeiMing Student Scholarship (Top 10% among over 840 undergrad students in School of Physics) 2022
- Grand Prize in “Challenge Cup” National College Student Competition (Top 4% among over 900 competing teams) 2022
- “Outstanding” evaluation in Yutchun-Weizmann Winter School (Top 35% among over 60 students) 2022
- Merit student in Peking University (Top 5% among all undergraduate and graduate students in Peking University) 2021
- Qin Wanshun Jin Yunhui Scholarship (Top 2% among all undergraduate and graduate students in Peking University) 2021
- Second Prize in “Challenge Cup” National College Student Competition (Top 15% among over 600 competing teams) 2021
- The Third Prize of Physics Competition of Chinese College Students 2020
- The First Prize of Mathematics Competition of Chinese College Students 2020
- The First Prize in the 35th National Physics Olympiad 2018

## **ADDITIONAL INFORMATION**

**Laboratory:** AFM, STM, TEM, Spectrometer, Inkjet Printer, Schlenk Line, Evaporator, etc.

**Programming:** Python, Mathematica, MATLAB, FDTD, COMSOL, LATEX