Xianhao Lin

Phone: +86 13666946077   Email: xianhaol707@gmail.com   Address: Nanjing

EDUCATION

Nanjing University   Sep 2021 - Jun 2025

Bachelor of Science in Physics   Nanjing

GPA:4.23/5.0

IELTS: 7.0/9.0

RESEARCH EXPERIENCE

Rice University, SCI | Research Assistant   Jul 2024 - Present

Advisor: Prof Yimo Han   Houston

Abstract：

· Learn the basic knowledge about TEM (especially 4D-STEM) and fundamental manipulation about STEM.

· Study the data processing and analysis from 4D-STEM.

Project 1 : Machine Learning in 4D-STEM Data

· Use machine learning to process 4D-SETM data and uncover deformations in different matrials like Perovskite and Nanowire.

Project 2 : Large-scale polarization and strain mapping in BFO using 4D-STEM nanobeam diffraction

· Use machine learning to cluster domains in BFO thin films with diffrent polarization.

· Map the polarizaition in each domain by electron diffraction pattern (kikuchi line) in crystal orientation (110).

· Generate the mapping of strain and lattice rotation in BFO film.

Project 3 : 4D-STEM Diffraction simulation and Ptychography in SnS

· Use abtem to simulate the diffraction pattern in different stack of SnS(AFE and FE), compare the simulation with the experimental data.

· Using the simulation data to reconstruct the 3D structure of SnS by Ptychography.

Nanjing University, School of Physics | Research Assistant   Oct 2023 - Present

Advisor: Prof Qi Zhang   Nanjing

Project 1 : THz Cavity

· Use laser transmitter and FM optical path to generate THz light. create a terahertz electromagnetic environment in an optical resonant cavity made by silcon

· Learn the Cavity QED theory and different experiments about properties（superconductivity, strong correlated system ......） of 2D materials under different cavity modes.

· Study the simulation of Split-ring resonator cavity by CST studio, design a specific SRR cavity mode to couple with the phonon mode in $Fe_2Mo_3O_8$.

Project 2 : Magnetic SHG

· Learn the principle that how elelctric dipole, electric quadrupole and magnetic dipole generate SHG signal in $Fe_2Mo_3O_8$.

· Measuring SHG signal in $Fe_2Mo_3O_8$ by time-resolved SHG probe under different experimental conditions.

· Fit the experimental datas to compare with 3 ideal curves to find the source of the SHG signal in different conditions.

Nanjing University, School of Physics | Research Assistant   Dec 2023 - Jun 2024

Advisor: Prof Chunfeng Zhang   Nanjing

Project:Construction of Terahertz (THz) time-domain Spectroscopy

· Learn the principle of carrier dynamics in semiconductor studied with THz-TDS

· Familiar with the construction of terahertz optical path of laser pump-probe scheme and the function of related optical elements and learn to adjust and optimize light paths.

· Study the data processing and image analysis in frequency domain and time domain spectrum

Nanyang Technological University,SPMS | Summer Research Student   Jul 2023 - Aug 2023

Advisor: Prof Yong Ee Hou   Singapore

Project : Molecularity in G-Quadruplex DNA

· Learned the current research status about G4, a special secondary DNA structure often found in telomeric by literature review.

· Used 10 kinds of machine learning model(from sklearn) like Random Forest, Decision Tree, SVC and so on to predict the molecularity of G-Quadruplex.

· Developed an ML model to predict G4 molecularity, which could help us deduce the mechanism behind G4 molecularity formation by unique visualization of the underlying principles learned by the model.

SKILLS

· Computer : Python Data analysis and Scientific Computing, Matlab, machine learning, Comsol, CST studio simulation, abtem simulation, VESTA

· Experimental: THz-TDS

· Language : English, Chinese

HONORS & AWARDS

Third Grade Award in the 26th Forum of Science & Arts of Nanjing University   May 21st,2023