

Yu Zhang

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RESEARCH INTERESTS

Experimental Condensed Matter Physics

ACADEMIC QUALIFICATIONS

Sep. 2012 – Jun. 2016

B.S. in Physics, Fudan University

Overall GPA: 3.67 /4.0 Ranking: 11/114

Jul. 2014 – Nov. 2014

Extension Program in University of California Berkeley

GPA: 4.0/4.0

Main Major Courses: Classical Mechanics (A), Electrodynamics (A), Thermodynamics and Statistical Physics I (A), Quantum Mechanics I (A), Solid State Physics (A-),

RESEARCH EXPERIENCE

Jun. 2015 – Present

Nanoscale Tension Sensor Based On Black Phosphorus

Advisor: Prof. [Yuanbo Zhang](#)

To Investigate the electronic properties of black phosphorus (BP) flake under strain and utilize the resistance-strain relation to develop strain nano-sensor

- Fabricated the BP flake with exfoliation process and deposited electrodes with EBM to make the BP transistors. Identified the BP crystal axis with initiative Angle-Resolved Raman Spectrum
- Developed a device to bend the Kapton polyimide film substrate to exert multi-direction uniaxial strain on black phosphorus sample
- Accomplished the simulation of configuration of substrate bending and its strain on BP samples with finite element analysis software ABAQUS
- Exploring the electrical properties of black phosphorus with four-terminal configuration and their change under strain

Jan. 2015 – Present

Properties of Two Dimensional Materials under High Pressure

Advisor: Prof. [Yuanbo Zhang](#) , Collaborator: Wenge Yang, [HRSTAR](#)

To investigate the possible new phases of 2D materials under extreme conditions (high pressure, low temperature, high magnetic field)

- Constructed a prototype of a fiber Raman system with 100 μ m optical fibers and fiber lens, succeeded in observing the photoluminescence (PL) signal from a separated ruby ball
- assembled an *in situ* Raman system for the Diamond Anvil Cell (DAC) to make PL measurement, calibrated the pressure with the PL signal of ruby ball probe inside the cell
- Eliminated the noise by replacing ceramic terminal with metal one and enhanced the coupling efficient with self-designed holder
- Tested the transportation properties of La₂FeMnO₆ bucked sample and succeeded in observing the structure transition under high pressure with our DAC in Oxford cryogenic instruments
- To test the superconducting transition of layered materials like MoS₂, 2H-TaS₂ under ultrahigh pressure (up to 200GPa) and low temperature and to find a possible way to increase T_c

- May. 2015 - **Setting up Angle-Resolved Spectrum Raman spectroscopy**
Jul. 2015 **Advisor: Prof. [Yuanbo Zhang](#)**
- Established a whole set of programs including the control program of Newport rotation stage used to rotate the halfwave plate (LabVIEW), data collecting program by spectrograph (C based script) and data analysis program (MATLAB)
 - Realized the function of measuring the relation between the Raman spectrum and the direction of incidental beam's polarization
 - Tested the system by measuring the angle dependent Raman spectrum of silicon, graphite and black phosphorus

- Sep. 2014 - **Laboratory experiences in University of California, Berkeley**
Dec. 2014 **Advisor: Prof. [Feng Wang](#), Ultrafast Nano-Optics Group**
- Assembled a system in which high frequency signals from a MCT Infrared sensor was gathered by NI DAQ and analyzed by a virtual phase-locked amplifier written with LabVIEW
 - Mastered the technique of AFM, and investigated papers on scanning near-field optical microscope (sNOM) and surface plasma
 - Exfoliated graphene samples and practiced elementary techniques of nanofabrication (e.g. shadow mask)

- Jun. 2014 - **Laboratory experiences in Fudan University**
Aug. 2014 **Advisor: Prof. [Faxian Xiu](#), Nanomaterials and Device Laboratory Group**
- Investigated the theory and establishment of Raman spectrum, as well as the calibrating techniques and maintenance of optical systems
 - Being in charge of setting up a new Raman spectrum in the laboratory of prof. Xiu. Purchased all the instruments and setup the shielding curtain around the optical table

SERVICE EXPERIENCE

- Jun. 2012 – **Teaching Assistant in Shanghai Kong Jiang Senior High School**
Sep. 2013 Coached high school students weekly for Olympic Physics Competition
- Jun. 2013– **Academic Minister in Students' Federation of Physics Department in Fudan University**
Sep. 2014 Organized speeches and seminars, collected lab academic resources and provided the guidance of participating in researches for junior students

AWARDS

- 2013,2014 Second Class Scholarship
2012 Freshman Scholarship
2013,2014 Honored Student Scholarship
2013 Second in China Undergraduate Physics Tournament