Jiachen Yu

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School of Physics, Peking University, Beijing 100871, P. R. China

Education Background

Peking University, Beijing, China 2013 – Present

B.S. Candidate, Major in Physics
GPA: 3.70 / 4.00

Related Undergraduate Courses and Scores

Quantum Mechanics (A)	96.5	Electrodynamics (A)	96
Mathematical Methods in Physics	97	Advanced Topics in Quantum Mechanics	95
Solid State Physics	96	Seminar for Solid State Physics	95
Seminar for Quantum Mechanics	97	Modern Physics	97

Related Graduate Courses and Scores

Semiconductor Physics	96	Group Theory	97
Physical Properties of Quantum Materials	94	Solid State Theory	94

Publications

1. Lei Fu, Yi Wan, Yimin Ding, Jing Gao, **Jiachen Yu**, Hongming Guan, Kun Zhang, Weiying Wang, Caifeng Zhang, Junjie Shi, Xiang Wu, Sufei Shi, Weikun Ge, Lun Dai, Bo Shen, Ning Tang†, "K-Λ Crossover in the Conduction Band of Monolayer MoS_2 under Hydrostatic Pressure", submitted to ***Nature Communications***.
2. Xiaozhi Xu*, **Jiachen Yu***, Zhihong Zhang*, Kaihui Liu†, "Band Gap Opening in Graphene", ***Chinese Science Bulletin***, in press. (Invited review article, written in Chinese).
3. Xiaozhi Xu*, Ding Yi*, Quixi Qiao*, **Jiachen Yu***, Zhichang Wang, Zonghai Hu, Zhongfan Liu, Dapeng Yu, Enge Wang, Ying Jiang†, Feng Ding†, Kaihui Liu†, "Surface Index Dependent Copper Oxidation Protection by Graphene Coating", submitted to ***Nature Communications***.

(* : Equal contribution, † : Corresponding author)

Research Experience

High Pressure Photoluminescence Study of Monolayer MoS_2 May 2015 – Present

School of Physics, Peking University *Advisor: Prof. Weikun Ge, Prof. Ning Tang*

- Conducted Photoluminescence (PL) study of monolayer MoS_2 under hydrostatic pressure, using diamond anvil cell.
- Developed microscopic PL system using real-time imaging for excitation laser focusing to improve PL signal strength.
- Observed a conduction band minimum transition from K to Λ and a band anticrossing behavior near the transition. Quantitatively obtained the relation of band gap width and external pressure.

Detecting Bosonic SPT Order in Bilayer Graphene Summer 2016

Department of Physics, UC Santa Barbara *Advisor: Prof. Andrea Young*

- Studied bosonic symmetry protected topological order in a bilayer graphene quantum point contact (QPC), and monolayer quantum Hall interferometry.
- Fabricated high-frequency shot noise cryogenic measurement circuitry.
- Fabricated monolayer graphene QPC and interferometer device.
- Constructing transfer station for van der Waals heterostructure fabrication.

Cu Oxidation Protection by Graphene Coating March 2016 -– Present

School of Physics, Peking University *Advisor: Prof. Kaihui Liu*

- Studied CVD-grown high-quality graphene coating on monocrystalline Cu as an anti-corrosion protection.
- Graphene on Cu(111) protects corrosion perfectly, yet on Cu(100) it gives no protection.
- Used LEED, Raman and STM to investigate the surface configuration. Proposed a Moiré pattern-related mechanism that accounts for the surface-index dependence.

Research Skills

- Exfoliation, transfer, nano-device design and fabrication.
- Photoluminescence spectrum measurement and photocurrent measurement.
- Design and fabrication of circuitry used in cryogenic transport measurement.
- Atomic force microscope, scanning tunneling microscope.
- Van der Waals heterostructure transfer station construction.

Awards and Honors

- **2nd** Scholarship for freshmen, Peking University, 2013
- **"Wusi"** scholarship, Peking University, 2015
- **"Weiming Xuezi"** scholarship, School of Physics, Peking University, 2015 & 2016
- **"Keqi Shen"** scholarship, Peking University, 2016
- **"Merit student"**, Peking University, 2016

Outreach

- Initiated and organized "High School Student Future Career Planning", a series of lectures given in the High School Affiliated to Renmin University of China, providing detailed information on majors and disciplines in higher education.