SHAN ZHONG

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EDUCATION

Peking University *09/2017-*
Major in Physics, School of Physics
Minor in Machine Intelligence, School of Electronics Engineering and Computer Science

- GPA:3.67/4.0 (second year: 3.75)
- Computer Skills: Matlab, Python, Mathematica, LaTeX, C/C++, html, Linux
- English: GRE 328 (158/V+170/Q+3.5/AW), GRE Physics sub 990

RESEARCH INTERESTS

- ab-initio calculation of electronic structure
- scanning probe microscopy
- controllable material synthesis and characterization

RESEARCH

Multilayer Graphene and Its Synthesis Method Septemper 2018 - January 2019
Advisor: Zhongfan Liu *College of Chemistry and Molecular Engineering, Peking University*

· When scientists twist single atomic layers of suitable materials, such as graphene, new properties emerge.
· It was shown in 2018 that as the twist angle between two graphene sheets is tuned to about 1°, the physical properties of the system change dramatically.
· By slightly modifying the traditional CVD method, we realized the stable synthesis of twisted bilayer graphene on the copper foil, providing the platform for further studies.
· This work was collected into a patent and has been received by China Patent Office.

Orbital Selective High-Temperature Cooper Pairing Developed at the Two Dimensional Limit Februray 2019 - present
Advisor: Jian Wang *School of Physics, Peking University*

· Pioneered by Prof. J. Hoffman *et al*, quasiparticle interference(QPI) analysis has been widely implemented in the study of electron pairing mechanism of high-temperature superconductors.
· We prepared one-unit-cell FeSe/$SrTiO_3$ with Molecular Beam Epitaxy(MBE) method, with moderate amount of as-grown defects.
· We provided concrete evidence for orbital selective Cooper pairing, revealed by anisotropy of the scattering intensity of the Fermi pocket.
· I developed the QPI analysis procedure, and was in charge of all the data processing.
· This work is being organized and will be submitted to *Nature Physics*.

Mott-like Electron Correlations Revealed by Spectroscopic Weight Transfer in AB-stack Bilayer Graphene July 2019 - present
Advisor: Jian Wang *School of Physics, Peking University*

· We prepared Bernal stack (AB stack) bilayer graphene on the SiC substrate with a flash annealing technique.

· Through spectroscopic analysis I found weight transfer phenomenon that implies electron correlations resembling Mott physics.
· The results are being organized into another paper.

Correction Schemes for Charged Defects with Periodic Cells Septemper 2019 - present
Advisor: Ji Chen *School of Physics, Peking University*

· Through literature reading I grew familiar with the existing correction schemes for the calculation of charged defects under periodic boundary conditions.
· I am working to complete the integrated python code that may facilitate a more convenient correction procedure.

OTHER EXPERIENCES

- Editor of *PKU Physical Review*, Issue 2
- Vice minister of Academic Practice Department of the Students' Union (in charge of academic lectures and talks) in the School of Physics 09/2018-06/2019
- Visiting student at Southern University of Science and Technology (SUS Tech) 06/2019

HONORS AND AWARDS

Merit Student in PKU	2017-2018
May 4th Scholarship	2017-2018
PKU Scholarship in Physics	09/2019
Ruitian Tomorrow's Star Scholarship	2018-2019
Excellent Research Award	2018-2019
First prize for National Mathematics Modeling Contest	10/2019