Zongqi Shen

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Education Background

Department of Physics, Fudan University *Sep.2018-June.2022*

Bachelor of Science in Physics

Research Interests

Emergent phenomena in strongly correlated electron systems

- Unconventional superconductors
- Complex oxides

Publications

[1] Jiahui Qian, **Zongqi Shen**, Xinyuan Wei, Wei Li, "Z_2 nontrivial topology of rare-earth binary oxide superconductor LaO" *PhysRevB.105.L020508*

[2] Lijie Wang, Huanyi Xue, Guanqun Zhang, **Zongqi Shen**, Gang Mu, Shiwei Wu, Zhenghua An, Yan Chen and Wei Li, "Two-dimensional superconductivity at heterostructure of Mott insulating titanium sesquioxide and polar semiconductor" *arXiv:2106.06948*

Research Experience

Scanning tunneling microscopy(STM) study of moiré graphene and TMDC materials *Aug.2021-Jan.2022*

Supervisor: Prof. Michael F. Crommie, UC Berkeley

- Characterized twisted bilayer graphene and transition metal dichalcogenides (TMDC) devices ($TaSe_2$, $NbSe_2$, $TaTe_2$, etc.). Studied the evolution of electronic structures with back gate.
- Imaged the Mott insulating behavior of monolayer 1T-$TaSe_2$ with 'flower pattern' orbital texture.

Study of unconventional superconductivity in oxides *May.2019-Aug.2021*

Supervisor: Prof. Wei Li, Fudan University

- Grew and optimized single crystal oxide thin films Ti_2O_3/GaN layer-by-layer with pulsed-laser deposition.
- Studied the nontrivial topology of rare-earth oxide superconductor LaO with first-principle calculation.
- Analyzed the energy splitting of La orbitals in oxygen octahedron crystal fields.

CVD growth of 2D materials and device fabrication *Nov.2018-May.2019*

Supervisor: Prof. Faxian Xiu, Fudan University

- Synthesized high quality Bi_2SeO_2 sample using chemical vapor deposition (CVD) method.
- Peeled off single-layered graphene for heterostructure fabrication.

Honors & Awards

- Excellent Student Award from Fudan University *Sept.2021*
- Selected for National Top Talent Undergraduate Training Program *May.2021*
- National Scholarship (1/115 in the Department of Physics) *Dec.2020*

Skills

Laboratory:

- Material Growth: PLD and CVD growth of thin films
- Characterization skills: STM/STS, AFM, Cryogenic Transport Measurements, MPMS, X-Ray Diffraction, Raman Spectroscopy

Theory:

- Programming: Python, C, Mathematica, *ab-initio*(Quantum-Espresso)