

# Shangyi Guo

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## Education Background

School of Physics, Shandong University (SDU)

Sept.2020-Jun.2024 (expected)

Bachelor of Science in Physics, Jingwei Leading Talent Program

- Overall GPA: **90.49**/100 (1<sup>st</sup> to 3<sup>rd</sup> semesters)
- Ranking: 3/80 (1<sup>st</sup> to 3<sup>rd</sup> semesters)

## Honors & Awards

- DeEdu Scholarship, SDU Nov.2021
- Annual Academic Scholarship, SDU Sept.2021
- Outstanding Student Cadre Award, SDU Sept.2021
- Excellent Student Award of International Plasma Physics Summer School, HIT Aug.2021

## Academic Interests

**Condensed Matter Physics: 2D quantum materials & devices, 1D semiconductors & optoelectronic devices**

- Understanding electronic and quantum properties of 2D systems by nano-device fabrication and electronic transport measurements
- Controllable synthesis and performance investigation of III-V nanowires semiconductor nanostructures for optoelectronic device applications
- First principles calculations of novel quantum phenomena in Condensed Matters

## Academic Experience

**Controllable synthesis and performance test of heterostructures III-V nanowires**

Sep.2021-Present

Supervisor: Prof. [Zai-xing Yang](#), Shandong University

- Synthesized heterostructures III-V nanowires with peculiar photoconductive properties by controllable vapor-solid-solid growth mode of CVD.
- Studied in electrical and photoelectric properties of heterostructures III-V nanowires by using Semiconductor Device Analyzer and semiconductor laser.
- Read masses of papers with regard to the III-V nanowires and participated weekly group meetings.
- Working on the project with Postdoc now.

**Design & development of a multifunctional passive filter for test circuits of 2D systems**

Jul.2021-Aug.2021

Supervisor: Prof. [Zhe Wang](#), Xi'an Jiaotong University

- Designed a kind of passive filter capable of adjusting cutoff frequency and passband range (1Hz, 100Hz and 1000Hz).
- Used the required components to weld the circuit according to the designed and simulated circuit diagram. (Three same multifunctional passive filters have been successfully fabricated and the performance is good.)
- Presented individual research report entitled "Multifunctional Passive Filter" in group meeting.
- Learned laboratory operations of 2D quantum materials and devices, prepared two-dimensional materials (graphene and hNB) with tapes, combined them into hNB-graphene-hNB structures under high power microscopy, and tested the properties of samples.

## Physical mechanism of membrane crossing and anticancer function of Nano-realgar

Mar.2021-May.2021

Supervisor: Prof. [Yang Tan](#), Shandong University

- Investigated relevant literature on the bactericidal effect of nanomaterials.
- Wrote a research report entitled “the Physical Mechanism of Membrane Crossing and Anticancer Function of Nano-realgar” by summarizing a number of papers, in which a conjecture on the physical mechanism of membrane crossing of Nano-realgar was put forward.
- Presented individual research report entitled “NANO-REALGAR · ANTI-CANCER · CELL MEMBRANE” in the final seminar.

## Academic Visiting

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|---|-----------------|
| • Winter camp for undergraduates, Shanghai Advanced Research Institute, Chinese Academy of Sciences, China                | <i>Jun.2022</i> |
| • International Plasma Physics Summer School, Harbin Institute of Technology, China                                       | <i>Aug.2021</i> |
| • Summer class “Preparation, Characterization and Application of Nanomaterials”, Polytechnic Institute of Porto, Portugal | <i>Jul.2021</i> |

## Academic Skills

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### Laboratory:

- Material preparation skills: CVD growth of thin films and nanowires, Stripping the 2D material with tape, etc.
- Micro- and Nano-fabrication skills: Electron Beam Lithography, Ion beam evaporation, etc.
- Characterization skills: STM/STS, AFM, Semiconductor Device Analyzer, etc.

### Theory:

- Programming: C, MATLAB, Python

## Additional Information

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### Language:

- Mandarin (Native)
- English (Professional proficiency)
- Spanish (Hobby)

### Position:

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|---|----------------------------|
| • Monitor of Physics class, School of Physics, SDU              | <i>Sept.2021-Present</i>   |
| • Striker of student football team, School of Physics, SDU      | <i>Sept.2020-Present</i>   |
| • Vice-monitor of physics class, School of Physics, SDU         | <i>Sept.2020-Sept.2021</i> |
| • Cadre of Academic Innovation Department of Student Union, SDU | <i>Sept.2020-Sept.2021</i> |

### Interests:

- Football
- Piano
- Rubik's cube
- Guitar