

# ZIEN ZHU

☎ +86-15255131181 🚗 Hefei, Anhui 230026 China

✉ zze20010516@mail.ustc.edu.cn 🌐 <http://home.ustc.edu.cn/~zze20010516>

## EDUCATION

---

🎓 *University of Science and Technology of China (USTC)*

**Bachelor of Science (Majoring in Applied Physics)** *Sept.2019-Jul.2023 (expected)*

**GPA:** 3.66/4.3 (Overall) 3.70/4.3 (Major) **Average Score:** 87.75/100 (Overall)

**Ranking:** 42/195 in Applied Physics 30/91 in Condensed Matter Physics

**Core courses:** College Physics Experiment: 96 Computational Physics: 92 Mechanics: 97

Electrodynamics: 99 Thermodynamics and Statistical Physics: 98 Atomic Physics: 93

## AWARDS

---

**National Inspirational Scholarship** (Top 5% among all students in USTC) *2022*

**First Prize, The 12th China Undergraduate Physics Tournament** (National Top 5%) *2021*

**The 12th China Undergraduate Physics Tournament** (1<sup>st</sup> in East China Division) *2021*

**National Inspirational Scholarship** (Top 5% among all students in USTC) *2021*

**Yang Ya Foundation Scholarship** (Top 5% among all students in USTC) *2020*

**Chen Guoliang Scholarship** (Top 5% among all undergraduates in USTC) *2020*

**Excellent Student Scholarship-Bronze** (Top 20% among all undergraduates in USTC) *2019*

## RESEARCH INTERESTS

---

- *Modeling and Manufacture of Low-dimensional Nanodevices*
- *Discovery and Characterization of Exotic Properties of Quantum Materials*
- *Computational Design of Novel Information and Energy Materials*
- *Development of State-of-Art Computational Methods*

## RESEARCH EXPERIENCES

---

⊛ **Adjustment of the work function of diamond with electric intercalation layers**

Advisor: *Prof. Boris Yakobson*, Rice University *Apr.2022-Oct.2022*

- Proposed a fast convergence Fourier analysis method for electrostatic potential distribution of a 2D lattice.
- Numerically calculated the spatial electrostatic potential distribution of different crystal planes by optimized summation methods in real space and reciprocal space, respectively.
- Derived a theoretical formula for the potential offset of different crystal orientations, in agreement with the DFT results.

⊛ **Mechanism of thickness-dependent color variation of 2D materials** **Report**

Advisor: *Prof. Boris Yakobson*, Rice University *Jun.2022-Aug.2022*

- Calculated the color of 2D materials based on electronic structure and transfer matrix method.
- Proposed a physical mechanism to explain the experimentally observed oscillation of the optical color of graphene, MoS<sub>2</sub> and WSe<sub>2</sub> by establishing a multi-beam interference model.

### ⊛ Kinetic Monte Carlo simulation of topographic evolution for CVD growth

Advisor: *Prof. Zhenyu Zhang, Prof. Ping Cui*, USTC

*Nov.2021-Jan.2022*

- Developed a deposition-diffusion-aggregation KMC model for simple substance growth.
- Performed accurate KMC simulation of monolayer hBN growth on graphene lasting 1ms.
- Verified the law of evolution of island morphology and density observed experimentally with temperature and deposition rate.

### ⊛ Thermochromic smart windows regulating radiative cooling and solar transmission simultaneously

Advisor: *Prof. Chongwen Zou*, USTC

*Dec.2022-Present*

- Designed intelligent windows which adjust the solar transmittance and infrared emissivity automatically for energy saving by combining WO<sub>3</sub> hydrogel or and VO<sub>2</sub>.
- Optimized the phase transition speed and optical modulation amplitude of the smart windows.

### ⊛ Preparation and optimization of electrochromic glass films with high discoloration rate and recyclability

Report

Advisor: *Prof. Chongwen Zou*, USTC

*Sept.2021-Dec.2021*

- Synthesised and characterized WO<sub>3</sub> and NiO complementary electrochromic films
- Optimized discoloration and cycle performance of the ITO/WO<sub>3</sub>/LiClO<sub>4</sub>/NiO/ITO device.

### SKILLS & STANDARDIZED ENGLISH TEST

---

Programming	C/C++, Python, Linux, Shell, Mathematica, MATLAB
Computational Expertise	VASP, Deepmd-kit, DPGEN
Experiment	XRD, STM, Magnetron Sputtering
TOEFL	102 (Listening: 28, Reading: 29, Writing: 20, Speaking: 25)

### EXTRA-CURRICULAR ACTIVITIES

---

Teaching Assistant for “Thermodynamics and Statistical Physics B” Course	<i>Sept.2022-Jan.2023</i>
Leadership of the Campus Alumni Volunteer Team	<i>Sept.2019-Sept.2022</i>
Community Volunteer for Epidemic Prevention and Control	<i>Jan.2021-Mar.2021</i>