ZIEN ZHU

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EDUCATION

University of Science and Technology of China (USTC)
Bachelor of Physics(Applied Physics Major) ***2019-2023***

GPA: 3.70/4.3(Major) 3.66/4.3(Overall) **Average Score:** 87.75/100(Overall)
Ranking: 42/195(in Applied Physics Major) 30/91(in Condensed Matter Physics)
Core courses: College Physics Experiment: 96/100 Computational Physics: 92/100 Mechanics: 97/100
Electrodynamics: 99/100 Thermodynamics and Statistical Physics: 98/100 Atomic Physics: 93/100

AWARDS

National Inspirational Scholarship(Top 5% among all students in USTC) ***2022***
First Prize*, The 12th China Undergraduate Physics Tournament**(National, Top 5%) ***2021
First Place*, The 12th China Undergraduate Physics Tournament**(East China Division, Top 1%) ***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 Department of Physics) ***2019***

SKILLS & STANDARDIZED ENGLISH TEST

Programming	C, C++, Python, Linux, Shell, Mathematica, Matlab
Computational Expertise	VASP, Deepmd-kit, DPGEN
Experiment	XRD, STM, Magnetron Sputtering
TOEFL	100(Listening: 29 Reading:29 Writing:20 Speaking: 22)

RESEARCH INTEREST

- ***Atomic-scale Modeling of Functional Quantum Materials and Nanoscale Devices***
- ***Observation and Characterization of Exotic Properties of Quantum Materials***
- ***Design and Manufacture of High Performance Energy Materials***
- ***First-principles Computation of Electronic Structure and Properties***

RESEARCH EXPERIENCES

Potential offset of diamond with electric intercalation layer Report

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

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

Color calculation of two-dimensional materials with different layers Report

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

- Calculated the color of 2D materials based on electronic structure and transfer matrix method.
- Explained the real physical mechanism behind the interesting "oscillation" of the optical color of 2D materials with the number of layers by establishing a multi-beam interference model.

7×7 Reconstruction of Si surface under machine learning potential

Instructor: *Prof. Zhenyu Zhang*, USTC ***Jul.2022-Present***

- Generate deep learning potentials of Si by training a neural network with deepmd-kit.
- Simulate the 7×7 reconstruction of Si surfaces with far more atoms using ML Potentials.
- Explain the mechanism and conditions of reconstruction from thermodynamic and kinetic perspectives.

Thermochromic smart windows regulating radiative cooling and solar transmission simultaneously

Instructor: *Prof. Chongwen Zou*, USTC ***Dec.2022-Present***

- Designed intelligent windows combining the thermochromic discoloration of hydrogel and VO_2.
- Intelligently and dynamically adjust the solar transmittance and infrared emissivity according to the external temperature to adjust the indoor temperature for energy conservation.
- Test the phase transition speed, cycle stability and optical modulation amplitude of the smart windows.

Monte Carlo simulation of the morphology evolution of vapor-deposited films during non-equilibrium growth

Report

Instructor: *Prof. Zhenyu Zhang*, USTC ***Nov.2021-Jan.2022***

- Developed a deposition-diffusion-aggregation(DDA) model to describe the process.
- Adapted a rational atomic dynamics process and an efficient direct algorithm.
- Predicted the topography evolution when changing the CVD parameters.

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

Report

Instructor: *Prof. Chongwen Zou*, USTC ***Sept.2021-Dec.2021***

- Prepared and characterized WO_3 and NiO complementary electrochromic films.
- Compared the discoloration and cycle performance of the electrochromic glasses.
- Optimized parameters by changing the mid—frequency magnetron sputtering conditions.

EXTRA-CURRICULAR ACTIVITIES

Teaching assistant in "thermodynamics and statistical physics" *Sept.2022-Jan.2023*
Leadership of the campus alumni volunteer team *Sept.2019-Sept.2022*
Communities volunteer for epidemic prevention and control *Jan.2021-Mar.2021*