JINGYI ZHUANG

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EDUCATION

Columbia University, Fu Foundation School of Engineering and Applied Science *New York, NY*
M.S. in Materials Science and Engineering (GPA: 3.6/4.0) *Aug. 2017 - Dec. 2018*
Advisor: Renata M. M. Wentzcovitch
Relevant Courses: Computations of Electronic Structure & Complex Materials, Theory of Crystalline Materials, Kinetics of Transformations, Mechanical Behavior of Structural Materials

Soochow University, College of Nano Science and Technology *Suzhou, China*
B.E. in Nanomaterials and Nanotechnology, physical direction (GPA: 3.5/4.0) *Aug. 2013 - Jun. 2017*
Advisor: Jianxin Tang
Relevant Courses: Semiconductor Physics, Atomic Physics & Quantum Mechanics, Solid State Physics, Surface & Interface, Thin Film Physics & Technology, Colloid & Interface Chemistry

RESEARCH

Project of Computational Materials in Extreme Conditions, Columbia University *New York, NY*
Graduate Student, Advisor: Renata M. M. Wentzcovitch *Mar. 2018 - Present*
Project: Thermodynamic properties of ε-Fe at exoplanetary conditions using T-dependent phonon gas model

- Performed first-principles simulations in earth inner-core and explanatory conditions by high-performance computing
- Proposed a temperature-dependent phonon gas model and applied quasi-harmonic approximation by considering Mermin functional, involving effects of electronic thermal excitations on phonons
- Developed a novel Python framework to calculate thermodynamic properties like vibrational entropy, free energy, thermal expansion coefficient, bulk modulus, equations of state, etc., for the temperature-dependent phonon gas model
- Investigated literatures for computational and experimental thermodynamic properties and found the results from this framework had good performance in comparisons
- Related publications and presentations:
  - Presented a poster in the MR43B section for 2018 American Geophysical Union(AGU) Fall Meeting
  - Submitted an abstract for oral presentation at 2019 American Physical Society(APS) Spring Meeting
  - Prepare a publication for this research

Project at Printable Electronics Research Center, Chinese Academy of Sciences *Suzhou, China*
Visting Scholar, Advisor: Zheng Cui *Mar. 2017 - Jun. 2017*

- Studied and operated printing organic electronic materials with applications of printable electronics inks with the feature size of micrometer level, assembled samples of printed carbon nanotube thin-film transistors
- Carried out experiments to test contact angles and widths of spinning and evacuating coating in various concentrations

Graduation Thesis of Solar Cell Simulations, Soochow University *Suzhou, China*
Research Assistant, Advisor: Jianxin Tang & Zheng Cui *Jan. 2017 - Jun. 2017*
Graduation thesis: solar cell simulations with different antireflection coating patterns

- Conducted in the Printable Electronics Research Center, SINANO, Chinese Academy of Sciences
- Investigated the light capturing principles of antireflection coatings and designed solar cells models
- Constructed 3D layered models of the designed solar cells in software Lumerical, with the antireflection coatings in different periods and patterns
- Performed solar cell simulations using the single-pointed incident lights of different wavelengths
- Gathered the simulation results and wrote the graduation thesis based on the analysis in comparisons to different patterns, different periods and different incident lights
- Presented this work and passed the defense

Project of Organic Solar Cells, Soochow University *Suzhou, China*

Project Leader, Advisor: Jianxin Tang *Mar. 2015 - Sep. 2015*

Project: The Photoelectric Conversion Efficiency of Organic Solar Cells

- Contacted the experimental opportunity with my advisor and managed the project as the group leader
- Designed the experiment, assembled experimental samples and did photoelectric estimation by the four-probe method, current density-luminance–voltage test, photoelectric efficiency detecting devices and softwares, etc.
- Gained the result that photoelectric conversion efficiency of organic solar cells is 10%
- Wrote experiment report and reported and defended the research result

Project of Organic Light-Emitting Diodes, Soochow University *Suzhou, China*

Project Leader, Advisor: Jianxin Tang *Jan. 2015 - May 2015*

Project: Efficiently Releasing the Trapped Energy Flow in White OLED with Multifunctional Nanofunnel Arrays

- Took part in releasing the trapped energy flow in white OLEDs and recorded the datasets
- Learned the usage of instruments, like physical vaporization deposition machine, and studied various advanced light manipulation approaches

EXPERIENCES

Advanced Thermal Interface Materials & Devices Lab, Chinese Academy of Sciences *Suzhou, China*

Summer Research Intern, Advisor: Jie Zhu *Jul. 2016 - Aug. 2016*

- Studied the laboratory safety rules regarding fire and toxicity and passed the related examinations
- Investigated the related literatures in designing the experimental method as electrodeposition
- Learned strict laboratory regulations like the standard procedures to enter the cleanroom and to wash glass equipment
- Prepared the superhydrophobic materials on copper surfaces and wrote experimental reports

Suzhou Bao Feng New Material Co.LTD *Suzhou, China*

Summer Intern, Material Inspector *Jul. 2015 - Aug. 2015*

- Learned specific properties of plastic materials and applied the skills to the detection
- Detected plastic granules' composition and physical properties of plastic batches

Suzhou Hao Shi Jia Material Co.LTD *Suzhou, China*

Summer Intern, Material Inspector *Aug. 2014 - Sep. 2014*

- Examined the raw materials and detected the composition of plastic granules
- Grasped some detection skills such as pinching, nipping and distinguishing the smell of burning

JESIE-Harvard Program, Harvard University *Boston, MA*

Student, Organizer: JESIE *Jul. 2014 - Aug. 2014*

- Took finance and management courses, Fundamentals of Financial Accounting, Fundamentals of Management and Leadership and gained a certificate in Finance and Accounting with the grade of A/A+
- Awarded three scholarships after accomplishing the program

AWARDS

- Awarded the third prize of scholarship of Soochow University, and first prize of College of Nano Science and Technology and the government scholarship for Jiangsu college students exchanging overseas ($8,000) in 2014
- Won an honored scholarship, 17th Extracurricular Academic Research Scholarship of Soochow University in 2015

SKILLS

Coding: Python, C, shell, Julia, Fortran, Markdown, HTML5, CSS, javascript, LaTeX

Software: Quantum ESPRESSO, MATLAB, Mathematica, Visual Studio Code, Adobe Photoshop, VEGAS

Device: Stepmeter, TEM, SEM, XRD