

# LU NIU

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## EDUCATION

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**University of Science and Technology Beijing**

*Sep. 2015 - Jun. 2017*

*MPhil in Science in Physics*

Subject: Atom and Molecular Physics

Thesis: Effect of External Field on the IV Characteristics through the Molecular Nano-junction.

## EXPERTISE AND TECHNICAL STRENGTHS

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| <b>Programming:</b> | C/C++, Fortran, Python, Julia, L <sup>A</sup> T <sub>E</sub> X;   |
| <b>Software:</b>    | Linux, Git, TensorFlow, VASP, Octopus;  |
| <b>Expertise:</b>   | Mathematical Analysis, Algorithm, Density Functional Theory, Plasmonics, Quantum Optics, Quantum Computation. |

## RESEARCH EXPERIENCE

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**Effect of External Field on the IV Characteristics through the Molecular Nano-junction**

*Sep. 2016 - Jun. 2017*

*Student*

*USTB, Beijing, P.R.China*

- Referred to materials about molecule; analyzed steady current of two electrodes under distinct bias voltages; studied transient current under Gaussian pulse with different widths;
- Established the physical model of Molecular junction with external field which could produce coupling with the molecule;
- Simulated the physical model and conducted scientific calculation with Fortran;
- Visualized the result with Python; compared I-V characteristic curve of the molecular junction impacted by external field with the curve without influence from external field;
- Drew the conclusion that external light field may impose effective influence on the molecular junction.

**Plasmon Enhanced Heterogeneous Electron Transfer with Continuous Band Energy Model**

*Apr. 2016 - Mar. 2017*

*Student*

*USTB, Beijing, P.R.China*

- Calculated Plasmon enhanced heterogeneous electron transfer in semiconductor continuous model with master equation;
- Simulated the physical model and conducted scientific calculation with Fortran and Visualized;
- Visualized the result with Origin.

**Molecular Emission Spectrum of Combined System and its Fourier Analysis**

*Dec. 2015 - Apr. 2016*

*Student*

*USTB, Beijing, P.R.China*

- Consulted related materials; probed into emission spectrum of molecular with Fourier analysis;
- Built the equations set which describes the physical process of the molecule system excitation in the quantization radiation field;
- Solved the equations with Fortran.

## INTERNSHIP EXPERIENCE

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**Analytical Mechanics**

*Teaching Assistant*

*Spring, 2017 and Spring, 2016*

*Professor Luxia Wang*

- Organized exercise class; answered students' questions;
- Corrected assignments and papers;
- Helped teacher prepare course related materials.

### **College Physics**

*Teaching Assistant*

*Autumn, 2016 and Autumn, 2015*

*Lecturer Quanshui Li*

- Corrected assignments and papers;
- Answered students' questions after class.

## **PUBLISHED RESEARCH ARTICLES**

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### **2018**

- Lu Niu, Luxia Wang\*; *Effect of External Field on the I-V Characteristics through the Molecular Nano-junction* (in Chinese); Acta Physica Sinica, 67, 027304 (2018).

### **2017**

- Dandan Zhao, Lu Niu, Luxia Wang\*; *Plasmon Enhanced Heterogeneous Electron Transfer with Continuous Band Energy Model*; Chemical Physics, 493 (2017) 194-199.

## **AWARDS AND HONORS**

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*2015*

Third-Class Scholarship, University of Science and Technology Beijing