Qian Song

Department of Physics, Nanjing University, 210093, Nanjing, China

qian.song@alumni.ubc.ca, 131120018@smail.nju.edu.cn

Cell: (+1) 778-929-9721

**EDUCATION BACKGROUND**

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| --- | --- |
| 08/2016-01/2017 | Department of Materials Engineering, University of British Columbia, Vancouver, Canada |
|  | Visiting Research Student |
| 09/2013-07/2017(expected) | Department of Physics (Elite program), Nanjing University, Nanjing, China |
|  | B.S in Physics, Overall Score: 90.6/100 (2%) |
| 09/2010-06/2013 | High School Affiliated to Nanjing Normal University |

**RESEARCH INTEREST**

Condensed Matter Physics (experiment)

**AWARDS/HONORS/SCHOLARSHIPS/MEMBERSHIP**

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| 09/2012 | 1st Prize of Chinese Physics Olympiad (Provincial Competition Area) | | 0.08%% | |
| 12/2012 | 2nd Prize of Chinese Mathematics Olympiad (Provincial Competition Area) | | | |
| 12/2012 | 2nd Prize of Chinese Chemistry Olympiad (Provincial Competition Area) | | | |
| 11/2014 | Bronze Award of University Physics Competition | | |  |
| 10/2014 | National Scholarship Award issued by Ministry of Education of China | 8000 CHY | | 2% |
| 11/2014 | 1st Elite Program Scholarship | 5000 CHY | | 4% |
| 11/2015 | 1st Elite Program Scholarship | 8000 CHY | | 4% |
| 04/2016 | Scholarship issued by Institute of High Energy Physics, Chinese Academy of Science | 2000 CHY | | 4% |

**JOURNAL PUBLICATIONS**

[1]. **Qian Song**, Wangfei Yang. A method to highly improve the quality of the reappearing image in Finel hologram,

2016 (7) 32-35, Physics Experimentation (in Chinese) [[pdf]](http://oversea.cnki.net/kcms/detail/detail.aspx?recid=&FileName=WLSL201607008&DbName=CJFD2016&DbCode=CJFD&uid=WEEvREcwSlJHSldRa1FhdXNXZjNkWmd0dStuSnR5Z3h2a0syc0piZUxrVT0=$9A4hF_YAuvQ5obgVAqNKPCYcEjKensW4ggI8Fm4gTkoUKaID8j8gFw!!)

[2]. Weijun Luo, **Qian Song**, Guangnan Zhou, and Guangrui (Maggie) Xia. Study of Black Phosphorus Using 442 nm Angular Resolved Raman Spectroscopy, 2016, submitted to Acs Nano, [arXiv:1610.03382](https://arxiv.org/abs/1610.03382)

[3]. Weijun Luo, Rui Yang, Jialun Liu, **Qian Song**, Wenjuan Zhu, Guangrui (Maggie) Xia. Thermal Sublimation: a Scalable and Controllable Thinning Method for the Fabrication of Few-Layer Black Phosphorus, in preparation.

[4]. Jianhui Zhang, Linwei Yu, **Qian Song**, [Youwei Du](http://www.sciencedirect.com/science/article/pii/S0003491615001062), Tunable surface and/or interface ferromagnetism of ZnO nanoparticles, 2015, Annals of Physics(358) 159-171 [[pdf]](http://www.sciencedirect.com/science/article/pii/S0003491615001062)

**RESEARCH EXPERIENCES**

* Aug. 2016-Jan.2017 Vancouver, Canada

Advisor: Dr. Guangrui Xia Department of Materials Engineering, University of British Columbia

**Study of Black Phosphorus Using 442 nm Angular Resolved Raman Spectroscopy**

* Measured the Angle-Resolved Raman Spectroscopy of the Black Phosphorus (BP) with thickness ranging from 10 nm to 200 nm on both SiO2/Si and Polyimide substrate
* Confirmed that 442 nm Laser can determine crystal orientation of BP with different thicknesses while 532 nm, 633 nm 785 nm can not, attributed to the fact that phase factors in Raman Tensors on Zigzag and Armchair directions have a definite relation
* Measured the Raman Peak Shift on both Zigzag and Armchair directions of BP from room temperature to 320 0C on both SiO2/Si substrate and Polyimide substrate
* Now simulating the Temperature Field under the 442 nm Laser heating effect by COMSOL
* Aug. 2016-Jan. 2017 Vancouver, Canada

Advisor: Dr. Guangrui Xia Department of Materials Engineering, University of British Columbia

**Thermal Sublimation: a Scalable and Controllable Thinning Method for the Fabrication of Few-Layer Black Phosphorus**

* Thermal Thinned Black Phosphorus on SiO2/Si substrate under 500 K, 550 K and 670 K and successfully thinned Black Phosphorus to 10 nm thickness, but some parts cracked.
* Thermal Thinned Black Phosphorus on Polyimide substrate to about 5nm thickness without cracks, which was mainly contributed to stress.
* Oct. 2015-June.2016 Nanjing, China

Advisor: [Dr. L](http://scholar.google.com/citations?user=c2s4TzoAAAAJ&hl=en&oi=ao)ibo Gao Collaborative innovation center of Artificial Microstructure Science and Technology

**Synthesis of 2-D semiconductor MoS2 by CVD and measurement of its property**

* Studied the growth and the characterizations of single-crystal graphene with Cu substrate
* Peeled off the bulk graphite to mono-layer graphene and characterized the sample using AFM
* Analyzed the growth condition for large scale single-crystal MoS2 through CVD tube furnaces
* April.2015- July 2015 Nanjing, China

Advisor: [Ing. Y](http://www2.ucar.edu/news/experts/steven-tomczyk)onghua Pan Basic Physics Laboratory **A method to highly improve the quality of the reappearing image in Finel hologram**

Sponsored by Department of Physics, Nanjing University

* Applied knowledge in optical interference to adjust the light path of conventional Finel hologram,
* Derived focused reappearing image which was much clearer than the conventional ones
* Oct.2014-Sep.2015 Nanjing, China

Advisor: [Dr. J](http://www2.ucar.edu/news/experts/steven-tomczyk)ianhui Zhang Collaborative innovation center of Artificial Microstructure science & technology

**Design Perovskite solar cells**

Sponsored by Department of Physics, Nanjing University

* Synthesized mono-dispersed TiO2 by chemical methods as the carrier transport layer
* Realized the self-assembly of mono-dispersed TiO2 by a nonaqueous method
* March.2014-Sep.2014 Nanjing, China

Advisor: [Dr. J](http://www2.ucar.edu/news/experts/steven-tomczyk)ianhui Zhang Collaborative innovation center of Artificial Microstructure science & technology

**Tunable surface and/or interface ferromagnetism of ZnO nanoparticles**

Sponsored by Department of Physics, Nanjing University

* Engineered the controlled ferromagnetism of ZnO nanoparticles by doping method

**PROFESSIONAL SKILLS**

Programming Language: Experienced in C/C++, FORTRAN

Experimental Skills: Familiar with Raman Spectroscopy, Atomic Force Microscope, Chemical Vapor Deposition

Computing Software: Mathematica, Origin, COMSOL

Computing Methods: Methods of integration, Runge Kutta method, Monte Carlo methods, Numerical linear algebra