

Weijun Luo

I am a 5th year Ph.D. candidate with a full-stack skillset and over 7-year-experience working in the cleanroom. I have 5 years of experience in fabricating periodic photonic nanostructures, dielectric gratings, and electronic devices like MOSFETs, packaging and performing optical spectroscopic and electrical measurements in cryogenic systems.

CONTACT INFORMATION

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EDUCATION

Boston University, Boston, Massachusetts, USA

Ph.D. candidate. Chemistry

Aug. 2017 - May. 2022 (expected)

- Dissertation topic: Investigations on The Light Matter Interaction in Strained Two-dimensional Layered Semiconductors

University of British Columbia, Vancouver, British Columbia, Canada

M.A.Sc. Materials Engineering.

2015 - 2017

Fudan University, Shanghai, China

B.Sc. Electronics Science and Technology (Material Physics)

Sep. 2009 - Jun. 2013

MAJOR RESEARCH PROJECTS

Experimental Characterization and Computational Study of Light Matter Interaction in Two-dimensional Quantum Materials.

1. Electrically-manipulated defect fluorescence in two-dimensional Gallium monochalcogenides on nano-pillar arrays. (2019 - present, supported by ORNL)
2. Experimental characterization and computational study of defect fluorescence and quantum emission in two-dimensional Gallium monochalcogenides on nano-pillar arrays. (2019 - present, supported by ORNL)
3. Electrically-manipulated exciton funneling in monolayer WSe₂ on nano-pillar arrays. (2020 - present)
4. Strained-manipulated defect fluorescence in Gallium monochalcogenides introduced and observed by fiber tip. (2019 - present, supported by Molecular Foundry, Lawrence Berkeley National Laboratory)
5. Experimental characterization and computational study of anisotropic electron - phonon interaction in atomically-thin pentagonal PdSe₂. (Ready for submission, supported by ORNL)
6. Experimental characterization and computational study of anisotropic phonon response of atomically-thin pentagonal PdSe₂. (Published in 2020, supported by ORNL)

TECHNIQUE AND
SKILLS

Micro and nanofabrication

Photolithography, electron beam lithography (EBL), Reactive ion etching (RIE) and Deep RIE (Bosch process)

Device fabrication and transport property measurements

MOSFET fabrication; electrical contact on III-V semiconductors; packaging and wire bonding; room and low-temperature electrical and optical measurements.

Device packaging system

Extensive experience in handling Kulicke & Soffa ball bonding system for wire connection.

Cryogenic system

Extensive experience in handling CIA cryosystem and Montana cryosystem for low-temperature spectroscopic and transport measurements.

Instrumentation of Optical spectroscopy

Horiba T64000 and HR800 spectrometers / Princeton SpectroPro HRS spectrometer / Renishaw In-via Spectrometer / Home-built laser confocal microscopy / spectroscopy system / photon-antibunching measurements/ fluorescence microscopy

TCAD simulation

Synopsys Sentaurus Process (Expert level on Version 2011 to 2017) / Tsuprem-4

Theoretical simulation

VASP/ Quantum Espresso / Phonopy/ Phono3py

Programming language

MATLAB / PYTHON

WORK EXPERIENCE **Facility trainer and lab assistant**

Trainer for electron beam lithography and atomic force microscopy, Precision Measurement Laboratory, Boston University Photonics Center. **Feb. 2020 - current**

Facility user

Optoelectronic Processing Facility, Boston University Photonic Center. **Sep. 2017 - current**

Facility user

4D LABS, Simon Fraser University, Canada **2016 - 2017**

Facility user

Advanced Materials Process Engineering Laboratory, UBC, Canada **2015 - 2017**

Back-end process engineer for TCAD simulation of "Vertical Doping Profile Control in High-Speed SiGe PNP HBTs."

Texas Instruments (TI), U.S.A **Jul. 2015 - Dec. 2016**

Lab technician

Raman spectroscopy service, University of British Columbia **Dec. 2014 - Apr. 2017**

PUBLICATIONS

1. **Weijun Luo**, Akinola D. Oyedele, Yiyi Gu, Tianshu Li, Xingzhi Wang, Amanda V. Haglund, David Mandrus, Alexander A Puzetzy, Kai Xiao, Liangbo Liang, Xi Ling. "**Anisotropic phonon response of few-layer PdSe₂ under uniaxial strain.**" Advanced Functional Materials 30, no. 35 (2020): 2003215.

2. Li, Tianshu, **Weijun Luo**, Hikari Kitadai, Xingzhi Wang, and Xi Ling. Advanced Materials 31, no. 8 (2019): 1807160.

3. Wang, Xingzhi, Nannan Mao, **Weijun Luo**, Hikari Kitadai, and Xi Ling. "Anomalous phonon modes in black phosphorus revealed by resonant Raman scattering." The journal of physical chemistry letters 9, no. 11 (2018): 2830-2837.

4. **Weijun Luo**, Rui Yang, Jialun Liu, Yunlong Zhao, Wenjuan Zhu, Guangrui Xia. "**Thermal Sublimation: a Scalable and Controllable Thinning Method for the Fabrication of Few-**

Layer Black Phosphorus." Nanotechnology 28, no. 28 (2017): 285301.

5. S. Arash Sheikholeslam, **Weijun Luo**, Cristian Grecu, Guangrui Maggie Xia, and André Ivanov. "**Hydrogen diffusion in amorphous ZrO₂.**" Journal of Non-Crystalline Solids 440 (2016): 7-11.

6. Nguyen, Hung, Chih-Fang Huang, **Weijun Luo**, Guangrui Maggie Xia, Zhiqiang Chen, Zhiqiang Li, Christopher Raymond, David Doyle, and Feng Zhao. "**Synthesis of large-scale 2-D MoS₂ atomic layers by hydrogen-free and promoter-free chemical vapor deposition.**" Materials Letters 168 (2016): 1-4.

7. Colton Wells, Jheng-Yi Jiang, Ting-Fu Chang, Chih-Fang Huang, Jiaxin Ke, **Weijun, Luo**, Guangrui Xia, Kuan Yew Cheong, and Feng Zhao. "**Stress and thermal characterization of 4H-SiC microelectromechanical structures.**" Materials Letters 191 (2017): 196-199.

HONORS AND AWARDS

2017 - 2022 Boston University Teaching / Research fellowship;

2015 - 2017 Texas Instruments (TI, U.S.A) full Sponsorship;

2015 - 2017 Annual Faculty of Applied Science Graduate Award, University of British Columbia;

2015 - 2017 Annual Graduate Student Initiative (GSI) Award, University of British Columbia;

2012 Renmin Scholarship for academic performance, Fudan University;

2012 Scholarship for Innovation, Fudan University;

2009 Scholarship for Outstanding Fresh Students, Fudan University;

2007 Gold medal winner of the 26th China Adolescents Science & Technology Innovation Contest (CASTIC);