Aalto University

Dissertation press release **Defence on 17th January 2020**

Two-dimensional layered materials for photonics application

Title of the dissertation	Fabrication of Optoelectronic Devices with Two-dimensional Layered Materials and Their Heterostructures
Contents of the dissertation	The rising requirements for broadband, highly efficient, and integrable photonic devices compel researchers around the world to find proper material candidates to complement silicon technology. Graphene and transition metal dichalcogenides (TMDCs), which belong to van der Waals materials, have drawn unprecedented attention due to the new applications enabled by their prominent physical properties. Especially in the fields of photonics and optoelectronics, two-dimensional (2D), layered materials offer several advantages compared with traditional materials. This thesis introduces 2D layered materials-based photonics devices, such as photodetectors and modulators. To achieve the goal, the corresponding fabrication methods, for example, exfoliation, transfer, pattern generation, dry etching and metal deposition are discussed in detail. This dissertation offers an attractive way for both theoretical investigation and practical applications utilizing few-layer 2D layered materials, as well as paving a new way for novel, high-performance optoelectronics devices.
Field of the dissertation	Micro and Nanosciences
Doctoral candidate	Hui Xue, M.Sc Born in Hefei, (China) 1989
Time of the defence	17.01.2020 time 12:00
Place of the defence	Aalto University School of Electrical Engineering, Micronova Large Seminar Hall, Tietotie 3, Espoo
Opponent	Professor Alberto G. Curto, Eindhoven University of Technology, Netherlands
Custos	Professor Zhipei Sun, Aalto University School of Electrical Engineering, Department of Electronics and Nanoengineering
Electronic dissertation	http://urn.fi/URN:ISBN *(permanent link to dissertation, if dissertation is already available in electronic form)*
Doctoral candidate's contact information	Hui Xue, Department of Electronics and Nanoengineering, hui.xue@aalto.fi, +358451048821