Special Issue

Semiconductors and Nanostructures for Electronics and Photonics

Message from the Guest Editor

Two-dimensional flakes of transition metal chalcogenides exhibit exceptional electronic properties that must be understood in order to provide the framework for modern electronic and photonic quantum technologies, such as superconductivity, charge density wave (CDW) state, metal insulator transition, ferromagnetism, correlated insulation, spin and valley polarization, exciton condensate state, etc. The critical temperature for these quantum physical phenomena lies in the cryogenic range (~1~100 K). Now, it is necessary to realize the utility based on 2D materials in various quantum technologies by increasing the critical temperature of these quantum stated in 2D materials. Among them, doping 2D materials, twisting between layers are recognized for customizing a wide range of fundamental optical and electrical properties to the atomically thin TMDs films, in particular, doping induced generation of the multi-exciton states, superconductivity, and ferromagnetism, to distinct phase transitions, are ideal for a wide range of optoelectronic applications, as well as the realization of quantum mechanical phenomena that were previously just theoretical.

Guest Editor

Dr. Krishna Prasad Dhakal

Department of Energy Science, Sungkyunkwan University, Suwon 16419, Republic of Korea

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Micromachines
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
micromachines@mdpi.com

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Editor-in-Chief

Prof. Dr. Ai-Qun Liu
1. Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University, Hong Kong, China
2. School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore 639798, Singapore

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