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# Nonlinear Optics with Nanomaterials

## Professor Zhipei Sun

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**Date: Thursday, December 12th, 2019, 10:30-12:00**

**Venue: 232, 3F Faculty of Engineering Bldg. 2**

### Abstract:

In this talk, I will discuss our recent results on nonlinear optics with one-dimensional (e.g., carbon nanotubes and nanowires) and two-dimensional layered (e.g., graphene, transition metal dichalcogenides, and black phosphorus) materials. These results show advantages of utilizing low-dimensional nanomaterials for various photonic and optoelectronic applications, such as high-purity quantum emitters, wavelength converters, and actively and passively mode-locked ultrafast lasers. Further, I will present our recent advances employing hybrid structures, such as two-dimensional heterostructures, plasmonic structures, and silicon/fibre waveguides integrated structures.

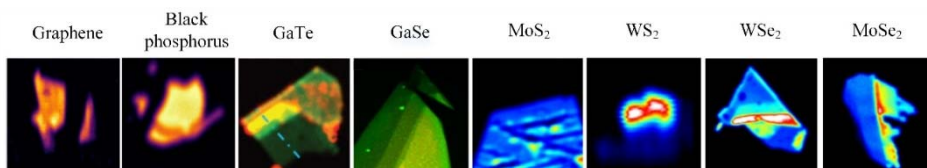
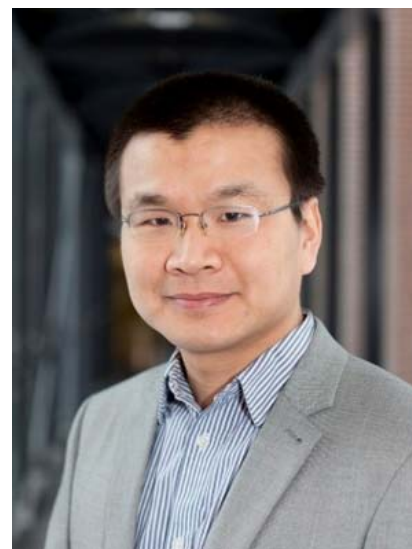


Figure 1. Nonlinear optical images of different two-dimensional layered materials

### Biography:

Zhipei Sun is Professor of Photonics and the head of the Photonics Research Group at the Department of Electronics and Nanoengineering of Aalto University, Finland. He earned his PhD from Institute of Physics, Chinese Academy of Sciences, in 2005. Currently, he is actively involved with European quantum flagship, Academy of Finland Photonics Flagship and Academy of Finland Centre on quantum technology projects. Recently, he received a European Research Council Advanced Grant for his work on nanomaterials based nonlinear photonics. His research interests include nonlinear optics, nanophotonics, and ultrafast photonics. In particular, he focuses on carbon nanotubes, graphene, and other two-dimensional layered materials for photonics and optoelectronics.

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