Special Issue

2D Materials Optoelectronic and Nanophotonic Devices

Message from the Guest Editors

The successful isolation and large-scale growth of graphene, the single-atom-thick carbon layer, have spurred the productive search for other 2D materials with unique electrical and optoelectronic properties. Compared to conventional optoelectronic materials with bulk lattices, 2D materials exhibit unique band structures, a strong quantum confinement effect, and the unprecedented freedom to construct 2D van der Waals heterostructures, thus allowing for new opportunities for controlling the light–matter interaction. They are also amenable to integration with conventional optoelectronic material platforms. Recent years have witnessed a number of breakthroughs in 2D-material-based optoelectronic devices, including photodetectors, modulators, and lasers. In addition, we have also seen the advancement of techniques to produce 2D materials, including chemical vapor deposition, wet chemistry, epitaxial growth, and chemical self-assembly, some of which are compatible with mass production and therefore raise expectations for viable commercial applications in the near future.

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