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Growth, fabrication, and applications of graphene nanostructures

GUANGYU ZHANG, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China — Recently, a broad category of research focused on graphene nanostructures, including graphene nanosheets and nanoribbons. These graphene nanostructures have unique properties related to their sizes, shapes, and edge configurations and might be used as building blocks for various miniaturized graphene-based devices. Large-area growth and scaled-up fabrication of high-quality graphene nanostructures are challenging. In this talk, I will introduce our recent progress on growing large area nanographene directly on substrates and scaled-up fabrication of graphene nanoribbons with controlled width and edge configurations (zigzag edges). Electronic and optical spectroscopy studies on the zigzag-edged graphene nanoribbons yield the experimentally observed metallic edge states and electron-phonon coupling effect. Nanographene-based piezoresistive strain sensors and resistive randomly accessed memories will also be introduced.

Guangyu Zhang
Institute of Physics, Chinese Academy of Sciences

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