Seminarankündigung

Donnerstag, 5. Juni 2014
16:30 Uhr
WSI, Seminarraum S 101

“Interface engineering for graphene transistors and photodetectors”

In this talk, we will present our efforts on interface engineering of substrate surface for graphene synthesis and device fabrication, as well as their applications in high-quality graphene transistors and photodetectors.

A substrate surface is a ubiquitous supporting platform for the formation of 2-dimensional (2D or graphene-like) layered materials. The interface between the 2D material and substrate is also the locus for carrier generation and transport. Herein we are focusing on the interface between graphene (carbon sources) and underlying growth substrate, and the one between graphene and modified substrate from the viewpoint of device applications. We find that the interface functionalities play a pronounced role for effectually controlling graphene synthesis and substantially minimizing the interface scattering effect, as well as generating and increasing the carrier mobility. The functionalized substrates include passivated SiO$_2$ surface on silicon substrate with self-assembled monolayers (SAMs), and silicon waveguide. The key techniques involved graphene synthesis, transfer and device substrates can be further applied to the other related 2D layered materials such as MoS$_2$. Moreover, by combining these 2D crystals in one particular stack, 2D-based heterostructures with desired functionalities can be achieved, which open up a new avenue for the future applications of 2D layered materials.

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